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DISSERTATION

The UN Climate Regime's Journey:

Contesting Legality and Constructing Substance

De zoektocht van het VN-klimaatregime:

Tussen twijfels over rechtmatigheid en een heroverweging van de materiële inhoud

The UN Climate Regime's Journey:
Contesting legality and constructing substance

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Susann Handke

DISSERTATION

The UN Climate Regime's Journey:

Contesting Legality and Constructing Substance

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LIST of ABBREVIATIONS

CBDR	common but differentiated responsibilities
CDM	clean development mechanisms
CER	certified emissions reductions
CMA	conference of the parties serving as the meeting of parties to the Paris Agreement
CMP	conference of the parties serving as the meeting of parties to the Kyoto Protocol
CO_2	carbon dioxide
COP	conference of the parties
EPA	U.S. Environmental Protection Agency
ERU	emission reduction unit
EU ETS	EU emissions trading system
FERC	Federal Energy Regulatory Commission
FYP	five-year plan
GATT	General Agreement on Trade and Tariffs
IEA	International Energy Agency
IET	international emissions trading
IPCC	Intergovernmental Panel on Climate Change
IPE	international political economy
IR	international relations
JI	joint implementation
KP	Kyoto Protocol
MEA	multilateral environmental agreement
NDC	nationally determined contribution
NEA	National Energy Act
NECPA	National Energy Conservation Policy Act
NIEO	New International Economic Order
OECD	Organisation for Economic Co-operation and Development
PA	Paris Agreement
PURPA	Public Utility Regulatory Policies Act
SDM	sustainable development mechanism
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN GA	United Nations General Assembly
WTO	World Trade Organization

OUTLINE – CHAPTER ONE

Introduction: International law, climate change, and the energy mix

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CHAPTER ONE

Introduction:

International law, climate change, and the energy mix

1.1. Background: Responding to a changing global climate

An increase in anthropogenic[1] greenhouse gas emissions in the atmosphere causes global warming. During the second half of the 20th century, this effect became all too apparent because it resulted in changing climate patterns. From the late 1980s onwards, the international community sought to address this issue by adopting binding rules that would place a limit on growing greenhouse gas emissions in an attempt to prevent what since then has been called "climate change."

Mitigating climate change and efforts to transform and decarbonise the energy system[2] are closely intertwined. In fact, it will be impossible to limit anthropogenic greenhouse gas emissions without finding alternatives for fossil-fuel based[3] energy generation. The development of the UN climate regime[4] shows that it is vital to acknowledge this interrelationship when making rules to

[1] The adjective "anthropogenic" points to the influence of human beings on nature.

[2] The term "decarbonisation" or "low-carbon transition" describes processes that largely avoid emitting carbon dioxide (CO_2) into the atmosphere, by gradually switching from fossil fuels (coal, crude oil, and natural gas) to other energy sources, such as hydropower, biomass, wind or solar energy. This process not only entails a change in fuels but also necessitates technological and regulatory adjustments to ensure the stability of the entire energy system and physical security of related infrastructure in a climate-constrained world. The introduction of low-carbon measures aims to reduce the carbon intensity of energy generation. CO_2 is one of the greenhouse gases and by far the most important driver of anthropogenic climate change. The combustion of fossil fuels is the main cause of the emission of this gas. With a share of 90%, CO_2 dominates energy-related greenhouse gas emissions. *See*, International Energy Agency (IEA), *CO_2 Emissions from Fuel Combustions: Highlights – 2016 Edition*. OECD/IEA: Paris, 2016a, 9; *see* on the nexus of energy, climate change and environmental issues, International Energy Agency (IEA), *Energy, Climate Change and Environment – 2016 Insights*. Paris: OECD/IEA, 2016d.

[3] Fossil fuels are coal, crude oil, and natural gas. They contain hydrocarbon material. When they are burned in air, fossil fuels produce heat (energy). *See*, Encyclopaedia Britannica, "Fossil Fuels," https://www.britannica.com/science/fossil-fuel.

[4] The UN climate regime consists of three treaties – the 1992 United Nations Framework Convention on Climate Change, 1997 Kyoto Protocol, and 2015 Paris Agreement as well as the decisions taken by the bodies of the regime. *See* for the treaties, United Nations Framework Convention on Climate Change, 9 May 1992, 1771 UNTS 107, 31 ILM 849 (1992), Kyoto Protocol to the UN Framework Convention on Climate, 11 December 1997, 2303 UNTS 148, 37 ILM 22 (1998), and Adoption of the Paris Agreement, Decision 1/CP.21

address climate change. This dissertation explores how increasing knowledge about climate change mitigation and its regulation influenced the legal development of the UN climate regime and how the regime's characteristics changed when the international community attached more weight to the complexity that the task of mitigating climate change involved.

The first steps to establish the UN climate regime were made during the 1990s. In 1992, the international community agreed on binding rules that prescribed how to avoid dangerous climate change and adopted the United Nations Framework Convention on Climate Change (hereafter throughout this dissertation UNFCCC).[5] Since then, the UNFCCC has been facilitating international climate cooperation. In 1997, the Kyoto Protocol[6] was the first attempt to substantiate and quantify the reduction of greenhouse gas emissions.

During the following decades, international cooperation under the UN climate regime evolved gradually, while the states parties were implementing the various measures that the Kyoto Protocol prescribed. However, the regime also needed to adjust to a new reality in the world economy[7] and incorporate an increasing understanding about climate change and its consequences. Furthermore, experiences with methods to reduce greenhouse gas emissions, which emerged from national policies, began to inform negotiations at the international level.

Starting around the turn of the century, most states contemplated some form of climate policy and passed climate and energy legislation.[8] In doing so, many states – both developed and developing – repeatedly faced daunting choices when they tried to simultaneously combat the effects of climate change and promote the shift away from fossil fuels to clean energy sources. Questions of justice relating to both the impact of climate change and access to energy, concerns for the environment amidst a global transformation of the energy sector, and the resilience of societies[9]

(FCCC/CP/2015/10/Add.1), 29 January 2016; in general, the decisions are accessible at United Nations – Climate Change, "Decisions," https://unfccc.int/decisions; and, given their relevance for the implementation of the PA, *see* specifically for the decisions of the 2018 Katowice Rulebook: Preparations for the implementation of the Paris Agreement and the first session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement, Decision 1/CP.24 (FCCC/CP/2018/10/Add.1), 19 March 2019; *see* for the decisions of the Katowice Rulebook, United Nations – Climate Change, "Katowice Climate Package," https://unfccc.int/process-and-meetings/the-paris-agreement/paris-agreement-work-programme/katowice-climate-package.

[5] United Nations Framework Convention on Climate Change, 9 May 1992, 1771 UNTS 107, 31 ILM 849 (1992).

[6] Kyoto Protocol to the UN Framework Convention on Climate, 11 December 1997, 2303 UNTS 148, 37 ILM 22 (1998).

[7] The commencement of international cooperation under the UN climate regime coincided with China's integration into the world economy after the country's accession to the World Trade Organization (WTO) in 2001. This development changed global trade patterns considerably, while China's economy grew at high annual rates during the first decade of the 21st century.

[8] In 1997, there were national 72 climate laws and policies. Since the adoption of the Kyoto Protocol, the number of climate laws has increased by a factor of more than 20. By 2017, all 197 signatories or states that had ratified the Paris Agreement explicitly addressed climate change or transitions to low-carbon economies in their national laws and policies. Moreover, 86% of the states have to some degree integrated climate concerns into energy policy. *See*, Nachmany, Michal, and Joana Setzer, "Global Trends in Climate Change Legislation and Litigation: 2018 Snapshot," Policy Brief, May 2018, http://www.lse.ac.uk/GranthamInstitute/ wp-content/uploads/2018/04/Global-trends-in-climate-change-legislation-and-litigation-2018-snapshot-3.pdf, pp. 2, 4.

[9] *See* for a conceptualisation of how these issues relate to the UN climate regime, section 7.4. and especially figure 7.4.

in the wake of devastating weather events and long-term climate change impacts came to the fore as burning issues in the annual UN climate negotiations throughout the 2010s.

1.1.1. An inconvenient reality

Climate change is a global and multifaceted phenomenon. For many people, previous predictions about its consequences have already become a reality. Yet, the burdens of mitigation and adaptation vary considerably, among states and within states.[10] The complexity of climate change reinforces entrenched inequalities and frictions in the international system. Furthermore, while multilateral negotiations aim to establish rules at the global level, most measures must be taken at the national level and adjusted to national and local circumstances.

By way of illustration, a glimpse at the news of late 2018 reveals how climate change and attempts to mitigate further global warming were transforming Germany's economy. At that time, the country's electricity consumption already relied for about 40% on renewable energy sources,[11] mainly solar and wind energy; and this component of the electricity sector was still expanding.[12] In November 2018, a large offshore wind park in the Baltic Sea was connected to the grid. Its capacity of 385 megawatts (MW) was roughly equivalent to the electricity demand of 400,000 households.[13] This milestone further manifested northern Germany as an increasingly important supplier of renewable power to other parts of the country.

At the same time, a commission – installed by the federal government – published its preliminary conclusions about the path to a country-wide phaseout of coal-based electricity generation.[14] The question of how to cope with the social and economic costs was one of the main issues. The publication of the commission's conclusions were met with a mixed response by the public. Environmental activists were worried about the proposed slow pace of this process, while politicians from regions where thousands of people were employed in opencast lignite mines were concerned about the social consequences of a fast coal phaseout.

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[10] Burden sharing within states is also a daunting issue. The mitigation of climate change and preparing societies for the consequences of global warming are emerging as a matter of equality and justice. *See* on issues of climate and energy justice, chapter seven.

[11] Renewable energy sources derive from natural sources or processes that are constantly replenished, such as solar, wind, biomass, and geothermal energy as well as hydroelectric power. *See*, Natural Resources Defense Council (NRDC), "Renewable Energy: The Clean Facts," 15 June 2018, https://www.nrdc.org/stories/renewable-energy-clean-facts#sec-whatis.

[12] Fraunhofer ISE, "Öffentliche Nettostromerzeugung in Deutschland 2018: Erneuerbare Energiequellen erreichen über 40 Prozent" [Electricity supply in Germany in 2018: Renewable sources of energy surpass 40 per cent], 2 January 2019, https://www.ise.fraunhofer.de/de/presse-und-medien/news/2018/nettostromerzeugung-2018.html.

[13] Urbansky, Frank, "Offshore-Windpark vor Rügen ging in Rekordzeit ans Netz" [Installation of offshore-wind farm off the coast of Rügen island was completed at record speed], *Springer Professional*, 8 November 2018.

[14] Die Bundesregierung, "Presseinformation: Zwischenbericht der Kommission Wachstum, Strukturwandel und Beschäftigung" [Press release: Preliminary report of the Commission growth, structural change, and employment], 1 November 2018, https://www.kommission-wsb.de/WSB/Redaktion/DE/Pressemitteilungen/20181101-presseinformation-der-vier-vorsitzenden.html.

In other regions of the country, this structural change had already begun. In late 2018, 200 years of coal mining came to an end in the industrial areas of North Rhine-Westphalia. In return for the pitmen's contribution to the prosperity of their communities, representatives of RAG, a large mining company, and public officials organised city festivals during the months of October and November.[15]

Only a few kilometres further west, people faced a far grimmer spectre of change. After an exceptionally dry summer, the water levels of the river Rhine were historically low. Since the Rhine is the main artery of inland water transportation in western central Europe, its water levels are important for the supply of many goods and resources, especially oil products. In late 2018, only reduced volumes of petrol and heating oil could be shipped to consumers in upstream Rhine regions. Petrol stations were gradually running out of diesel. In an effort to secure supplies, the federal government allowed regional authorities to rely on the country's strategic oil reserves.[16] Meanwhile, news outlets in the Netherlands reported that buying petrol in German border regions was becoming as expensive as at home.[17]

None of these news items made international headlines. These were stories of a slowly emerging new reality. Both the energy transition and the effects of climate change seemed manageable and well regulated in this part of the world. The global picture, however, was much more distressing.

Several climate-change related calamities attracted a great deal of attention in 2018. Japan was particularly hard hit by such catastrophes: Floods inundated 23 of the 47 prefectures. The country endured the strongest typhoon in 25 years and a relentless heatwave. These extreme weather events were so severe that the people chose the *kanji* character for "disaster" (災) to symbolise the year 2018.[18] The components of this character – large water courses and fire – describe what local communities in many regions of the world have to deal with when climate patterns begin to change.

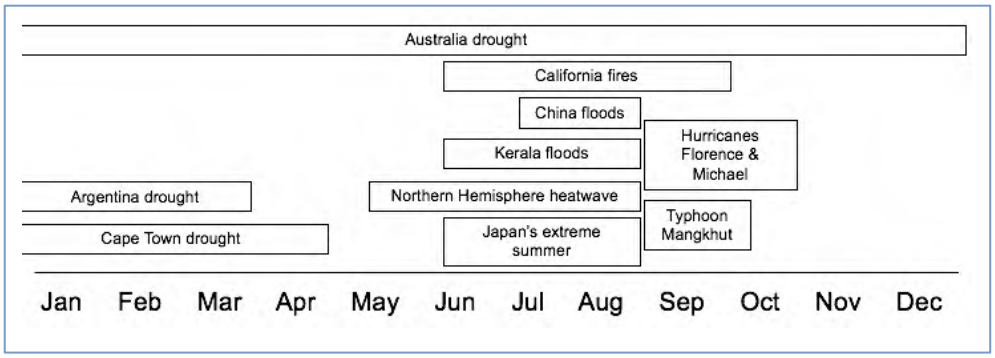
The year 2018, in particular its second half, was a reminder that climate change poses an existential threat to humankind, with devastating economic consequences. This threat was felt on all populated continents (*see* figure 1.1). As mentioned above, extraordinary rainfall caused severe floods in the south-western part of Japan during the summer months.[19] Kerala, a state in the

[15] "RAG lädt zum Abschied vom Kohlebergbau zu Bürgerfesten ein" [RAG invites to city festivals to celebrate the end of coal mining], *Westfälische Nachrichten*, 3 November 2018.
[16] "Ersten Tankstellen geht der Sprit aus" [Some petrol stations are running out of petrol], *SWR*, 27 October 2018.
[17] Molenaar, Sjors, "Tanken in Duitsland heeft geen zin meer" [Refuelling in Germany makes no sense anymore], *AD*, 13 November 2018.
[18] "Japan Picks 'Disaster' Character to Define 2018," *BBC*, 12 December 2018.
[19] Samenow, Jason, "Japan Reeling from Worst Flood in Decades: 'We've Never Experienced this Kind of Rain before," *The Washington Post*, 11 July 2018.

southwest of India, experienced the worst floods since the 1920s.[20] The United States was hit by the other extreme. In early November, unusually low rates of precipitation and a shortened rainy season in California became the perfect breeding ground for fast-moving deadly wildfires.[21]

Each of these disasters cost dozens of lives and destroyed the infrastructure and livelihoods of entire communities; and they were among the ten most expensive climate-driven weather events of 2018 that caused insurers expenses of billions of U.S. dollars (*see* table 1.2).[22] In addition, media coverage and the public debate about these events showed that people were increasingly aware of the direct link between climate change and instances of extreme weather. In the ensuing months and throughout 2019, experiences of climate change impacts would trigger climate protests and activism in many parts of the world.

Figure 1.1: Spatial-temporal spread of climate-change-related disasters in 2018



***Source*: Christian Aid, 2018 (online), p. 5.**

[20] Abi-Habib, Maria, "Kerala Flooding: Hundreds Killed in Indian State's Worst Rains since 1920s," *The New York Times*, 17 August 2018.
[21] Cappucci, Matthew, and Jason Samenow, "The Weather and Climate behind the California Infernos that Wrecked Paradise and Torched Malibu," *The Washington Post*, 12 November 2018.
[22] Christian Aid, a British non-governmental organisation, estimates that the damage covered by insures that these disasters caused reached about U.S.$85 billion. This actually underestimates the real material loss, as only the damage reported to insurers is included. *See*, Christian Aid, "Counting the Cost: A Year of Climate Breakdown," 27 December 2018, https://www.preventionweb.net/publications/view/62847, pp. 1–14; Banis, Davide, "10 Worst Climate-driven Disasters of 2018 Cost $85 Billion," *Forbes*, 28 December 2018.

Table 1.1: The ten most costly climate-change-related disasters of 2018

EVENT	ESTIMATED COSTS in U.S.$ billion TOTAL = 84.8–93.1
United States hurricanes Florence and Michael *tropical storms*	(Florence) **17** (Michael) **15**
United States, California Camp and Woosley Fires *wildfires*	(Camp Fire) **7.5–10** (Woolsey Fire) **1.5–3**
Europe *drought*	**7.5**
Japan *floods*	(June–July floods) **7** (Typhoon Jebi) **2.3–5.5**
Argentina *drought*	**6**
China *floods*	(July floods) **3.9** (floods after tropical storm Rumbia) **5.4**
Australia *drought*	**5.8–9**
India, Kerala *floods*	**3.7**
South Africa, Cape Town *drought*	**1.2**
Philippines/China typhoon Mangkhut *tropical storm*	**1–2**

***Source*: Christian Aid, 2018 (online), pp. 4–5.**

Growing public awareness coincided with expanding scientific knowledge on climate change and its consequences. In October 2018, the Intergovernmental Panel on Climate Change (IPCC) warned that "impacts on natural and human systems from global warming have already been observed,"

changing "many land and ocean ecosystems and some of the services they provide."[23] In fact, human activities had already resulted in 1.0°C of global warming compared to the pre-industrial era (before 1750).[24] The report warned the international community that a further temperature rise must not exceed 1.5°C. In November 2018, the U.S. Global Change Research Program published its Fourth National Climate Assessment[25] and concluded that the area burned by wildfires in the western United States had increased as a result of climate change. During the period from 1984 to 2015, the area that wildfires burned was twice as large as what would have been burned without climate change.[26]

Although by that time the international community had already been trying to coordinate the reduction of greenhouse gas emissions for more than two decades, a UN report found in November 2018 that the levels of these gases in the atmosphere had reached another record high.[27] With 405.5 parts per million (ppm), the concentration of carbon dioxide (CO_2) in the atmosphere had climbed to 146% of the value compared to the pre-industrial era. This gas was identified as the single most important anthropogenic greenhouse gas in the atmosphere, mainly because CO_2 was responsible for about 66% of the radiative forcing[28] that results from long-lived greenhouse gases.[29] Accordingly, CO_2 emissions were largely to blame for the process that led to global warming.[30]

Emissions set free during the combustion of fossil fuels to generate energy in the form of electricity, warmth or to move vehicles, ships or aircrafts were the main source of anthropogenic CO_2. By the mid-2010s, the generation of energy to facilitate transport, heating, and the use of electricity was responsible for 68% of the global anthropogenic greenhouse gases; and CO_2 held a share of 90% of these energy-related emissions (*see* figure 1.2).

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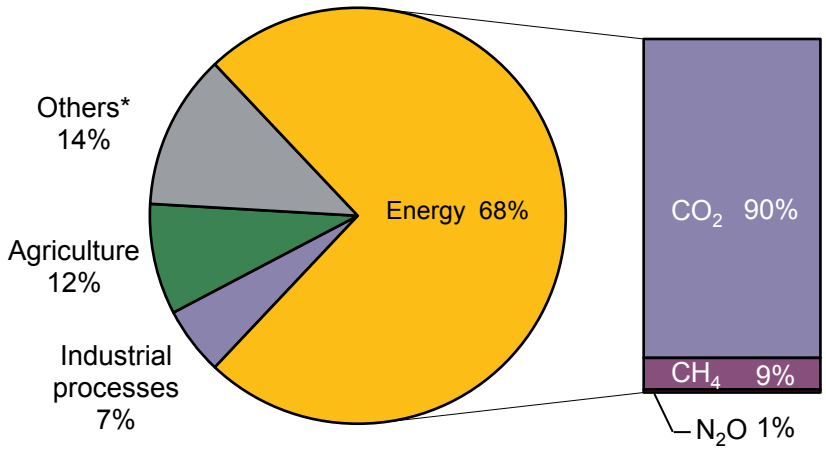
[23] Intergovernmental Panel on Climate Change (IPCC), "Global Warming of 1.5˚C: An IPCC Special Report on the Impacts of Global Warming of 1.5˚C above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty – Summary for Policymakers," 6 October 2018, http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf, p. 8, para A3.1.
[24] Ibid., p. 4, para A1.
[25] U.S. Global Research Program, *Fourth National Climate Assessment, Volume II: Impacts, Risks, and Adaptation in the United States*, November 2018, https://www.globalchange.gov/nca4.
[26] *See*, U.S. Global Research Program, *Fourth National Climate Assessment, Volume II: Impacts, Risks, and Adaptation in the United States*, November 2018, especially Chapter 25: Southwest, https://nca2018.globalchange.gov/chapter/25/.
[27] World Meteorological Organization (WMO), "The State of Greenhouse Gases in the Atmosphere – Based on Global Observations through 2017," *WMO Greenhouse Gas Bulletin*, no. 14, 22 November 2018, https://library.wmo.int/doc_num.php?explnum_id=5455, pp. 1–8.
[28] Radiative forcing is defined by the IPCC as a measure of the influence that a given climate factor has on the amount of down-ward-directed radiant energy that affects Earth's surface. Radiant energy is energy that is transferred by electromagnetic radiation. *See*, Mann, Michael E., "Radiative Forcing," *Encyclopaedia Britannica*, https://www.britannica.com/science/radiative-forcing.
[29] WMO, "The State of Greenhouse Gases in the Atmosphere," 2018, p. 3.
[30] The 2018 WMO report concluded that CO_2 emissions were the main cause of radiative forcing over the past decade as well as over the past five years. *See*, Ibid., pp. 3–5.

Figure 1.2: Estimated shares of global anthropogenic greenhouse gases, 2014



* Others include large-scale biomass burning, post-burn decay, peat decay, indirect N_2O emissions from non-agricultural emissions of NO_x and NH_3, Waste, and Solvent Use.

Source: based on IEA estimates for CO_2 from fuel combustion and EDGAR version 4.3.2 for CO_2, CH_4 and N_2O emissions and 4.2FT2010 for the F-gases; based on 100-year Global Warming Potential (GWP).

***Source*: IEA, 2017 (online), p. 9.**

Accordingly, the reliance on oil, natural gas, and coal to fuel economic activity was the predominant cause of human-induced climate change. By the end of the 2010s, this nexus was undeniable and a growing number of people had come to the conclusion that the carbon-based or fossil economy was unsustainable. The Paris Agreement[31] that had been adopted in 2015 reflected this growing awareness.[32] In late 2018, more detailed rules were adopted – the decisions of the Katowice Rulebook[33] – in order to put the provisions of the Paris Agreement into practice.

[31] Adoption of the Paris Agreement, Decision 1/CP.21 (FCCC/CP/2015/10/Add.1), 29 January 2016.
[32] Article 4 (19) of the Paris Agreement urges all states parties to consider "long-term low-greenhouse gas emission development strategies." *See* further chapter six and seven for an assessment of the Paris Agreement's mitigation provision.
[33] The Katowice Rulebook is not a book. The part that seeks to clarify the implementation of the Paris Agreement consists of 20 decisions – decisions 1 to 20/CMA.1.

1.1.2. Rules for a global transformation

Despite the proven link between CO_2 emissions and global warming, states where the extraction of fossil fuels provided important employment opportunities or significant government revenues were reluctant to acknowledge the causes of climate change. During the United Nations climate negotiations in Katowice, Poland, in December 2018, several major oil and natural gas producing states – Kuwait, Saudi Arabia, the Russian Federation, and the United States – refused to join other states in "welcoming" the above-mentioned 2018 IPCC report that urges the international community to avoid a temperature rise above 1.5˚C.[34] In Decision 1/CP.24, the parties instead welcomed "the timely completion" of the report.[35]

The politics of climate action are complicated, mainly because climate measures have significant economic implications. The UN climate negotiations seek to address and balance various interests. From the outset, economic considerations have shaped international climate cooperation under the guidance of the United Nations. Both developed and developing states were reluctant to agree on measures that would affect their economic policies. In addition, it took quite some time until it became clear that mitigating climate change will be an arduous task: States would need to actively abandon the economic growth model that relied on inexpensive fossil fuels. Can a multilateral environmental agreement coordinate this undertaking?

International environmental law comprises the practices and principles that have mainly influenced the UN climate regime. However, this field of international law was hardly equipped to guide and manage such a profound socio-economic transformation. Nevertheless, new instruments and mechanisms emerged from the annual climate negotiations from the mid-1990s onwards. The annual conferences of parties (COPs) led to new perspectives and pathways to improve the regime. The continued interaction of state representatives, non-governmental organisations, and other stakeholders, gradually changed the legal approach to international climate cooperation, as reflected in the UN climate regime after the adoption of 2015 Paris Agreement. This dissertation investigates and assesses the regime's evolution over the past decades. The next section details the scope and focus of the analysis.

[34] "Katowice COP24 Notebook: Campaigners Slam U.S. Fossil Fuel Stance," *Reuters*, 10 December 2018.
[35] Decision 1/CP.24, para 26.

1.2. Research topic: The evolution of the UN climate regime

During the second decade of the 21st century, the international community became increasingly aware of the complexity of meaningful climate cooperation. In this regard, three aspects of the UN climate regime's development stand out. First, rulemaking on mitigation measures began to take into account already ongoing climate change. Issues of mitigation and adaptation were ever more interlinked, ranging from infrastructure to national security matters. Second, efforts to reduce greenhouse gas emissions inevitably required extensive justice considerations, as they affected virtually all aspects of people's daily lives. Third, international and national rules were needed to coordinate efforts aimed to protect people against the physical and socio-economic consequences of climate change.

This emerging reality formed the backdrop for this research project that evaluated how the UN climate regime evolved from 1992 onwards. The project not only examined the legal and substantive development of the UN climate regime but also considered the question of how the regime mirrored the socio-economic complexity of mitigating climate change. It in particular analysed how, after the adoption of the 2015 Paris Agreement and 2018 Katowice Rulebook, the UN climate regime envisions international climate cooperation and how the regime enabled the international community to find regulatory solutions and meet the enormous challenges that lay ahead.

To relay the project's findings, this dissertation highlights several aspects of the UN climate regime. It centres around the regime's origins in international environmental law. It presents the regime's institutional development, taking the UNFCCC, a multilateral environmental agreement, as starting point. The dissertation explains the relation of this framework convention with the subsequent instruments that the states parties adopted, in particular the Kyoto Protocol and Paris Agreement. Furthermore, it provides an in-depth analysis of how efforts to differentiate obligations among states parties contributed to the regime's evolution.

When analysing the UN climate regime's legal and substantive evolution, the dissertation follows two main story lines – i.e. the management of economic differences between state parties and the way in which mitigation obligations are regulated and conceptualised. The first aspect concerns the operationalisation of the principle of common but differentiated responsibilities (CBDR), while the latter pertains to the difference between a top-down (internationally agreed) or bottom-up (nationally determined) approach to mitigation commitments as well as the substantive tendency of these commitments.

Article 3 (1) UNFCCC stipulates the CBDR principle; and Article 4 (3) of the Paris Agreement re-defines it. One of the main findings of this research project is outlined in chapter seven of this dissertation. It shows that the redefinition of the principle played a key role in the evolution of the regime and enabled a revised approach to the management of international cooperation on climate change mitigation, by allowing for nationally determined contributions under an international oversight mechanism.

This nexus between differentiation and the management of mitigation action formed the core topic of this research project. By highlighting and examining this nexus, the project analysed how the UN climate regime evolved in the context of its primary task – the mitigation of climate change – and was able to shape venues where diverging national policies can be presented, debated, and adjusted in a cooperative way.

To put this evolution into perspective, the research project included aspects of the climate debate that are not directly related to international environmental law, such as the role of domestic energy policies and laws in the fight against climate change. This part of the broader climate debate is significant, as the decarbonisation of energy generation – i.e. the process of abandoning fossil fuels – is the single most important step to reduce greenhouse gas emissions, as was discussed in the previous subsection (*see* subsection 1.1.1.).

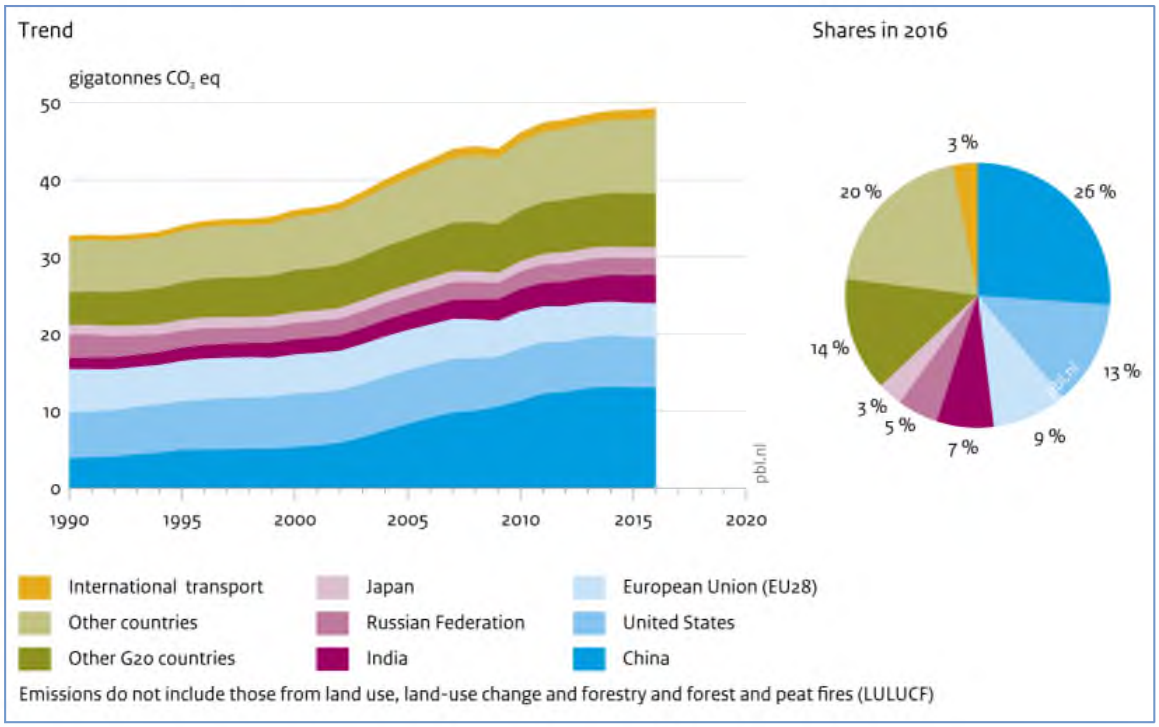
In addition, the governance of energy affairs is a key element of national economic policy, mainly because the composition of a country's energy mix – i.e. the fuels that are used to produce energy – involves various commercial, fiscal, environmental, geopolitical, and socio-economic considerations. Hence, an assessment of rules that impact the generation and use of energy needs to take into account the national level of policy and rulemaking.

This research project included this salient aspect of climate action and examined the interrelationship and interaction between domestic climate and energy policies and the UN climate regime. The choice was made to focus on the largest emitters of greenhouse gases – i.e. the European Union (EU),[36] United States of America (U.S.), and the People's Republic of China (*see* figure 1.3 on the development of the greenhouse gas emissions since 1990 and the shares in global emissions in 2016). Taken together, the three emitters were responsible for almost half of all annual

[36] At the time of writing, the negotiations about the further regulation of the withdrawal of the United Kingdom from the EU, especially in the field of energy and climate policy, were not yet finished. Moreover, the modalities that had to be negotiated concerned trade issues, while the legislation discussed in this dissertation regards the restructuring and integration of the EU electricity sector. Given that most matters relating to this dissertation concern developments prior to 2020, the use of "EU" points to the Union of 28 member states, if not stated otherwise.

greenhouse gas emissions when the Paris Agreement was negotiated. Section three of the next chapter further explains the choices that were made to structure this research project.

Figure 1.3: Global greenhouse gas emissions, per emitter and region; shares in 2016



***Source*: PBL, 2017 (online), p. 11.**

The examination of domestic legislation added an important perspective to the analysis and correlated nicely with the obligation of states parties to detail their nationally determined contributions to emissions reduction that the Paris Agreement introduced. Explaining how domestic climate and energy policies evolved in the three jurisdictions after the adoption of the 1997 Kyoto Protocol illustrates the influence of international law on domestic rulemaking efforts, and vice-versa when, taking into account these initial domestic developments, these parties reassessed their international postures in the UN climate regime.

Finally, in order to embed the evolution of the UN climate regime in major ideational developments that shaped international socio-economic debates, the research project went beyond the international environmental law context and the purely legal realm. Inspired by social constructivist approaches, it related the evolution of the UN climate regime to economic ideas

that shaped many international lawmaking efforts after World War II. In addition, it assessed the legal framework that the Paris Agreement creates from the perspective of climate and energy justice and energy policy concepts that go beyond the legal analysis of the UN climate regime. The research topic thus comprises the development of the UN climate regime in its legal, political and economic, and socio-environmental context. This broader perspective makes it possible to explore the UN climate regime's evolution and reflect on its link with the situation "on the ground," including the consequences of climate change as well as the impact of mitigation measures that the first section of this chapter described. Chapter two will explain in more detail how this research project approached the UN climate regime and how the theoretical framework of this dissertation facilitates the presentation of the project's findings (*see* sections 2.1. and 2.2.).

1.3. Objective: Understanding the UN climate regime

Comprehensive studies of the UN climate regime[37] generally focus on the development of the regime's legal instruments or discuss the regime from the perspective of climate governance and the workings of the various mechanisms that the regime created. However, thus far the drivers that shaped the regime's evolution hardly received any attention. No attempt has been made to assess the regime's legal and substantive evolution in the context of the transformation of the energy system as a response to the threat of climate change. This dissertation fills this gap.

1.3.1. Aim of the research project

By centring upon the UN climate regime's legality and substance, this research project aimed to reflect on the regime's development. To achieve this, the project considered the UN climate regime from three vantage points. First, the project explored how the regime re-imagined the task of mitigating climate change throughout its history. Second, it investigated how ideas that shaped the regulation of the global economy during the post-World War II era influenced the regime's evolution. Third, the project assessed the legality of the UN climate regime after the

[37] Bodansky, Daniel, Jutta Brunnée, and Lavanya Rajamani, *International Climate Change Law*, Oxford: Oxford University Press, 2017; Gupta, Joyeeta, *The History of Global Climate Governance*. Cambridge: Cambridge University Press, 2014; Mayer, Benoit, *The International Law on Climate Change*. Cambridge: Cambridge University Press, 2018.

adoption of the Paris Agreement, by relying on the interactional theory of international law that Jutta Brunnée and Stephen B. Toope developed.[38]

The discoveries that were made following these three avenues show that the UN climate regime is located at the intersection of environmental and economic regulation and energy affairs. The legality of the regime is vital to maintain the interaction between the national and international realms and to ensure the enactment of meaningful substantive provisions. The structure of the regime became more cohesive over time. At the same time, the UN climate regime opened up to nationally driven climate action.

With the adoption of the Paris Agreement, national climate action evolves within an international regulatory context. More flexibility in the treatment of individual states parties goes hand in hand with more clarity regarding the substantive direction of the regime. Hence, the dissertation appraises the maturing of the rules that the UN climate regime provides for managing cooperation among states parties to address global warming, as being shaped by economic ideas that the international community has been debating since the 1970s. These ideas also include demands for a special position of developing states in the context of addressing international environmental problems. The next subsection delineates the research question and hypotheses that this dissertation considers.

1.3.2. Questions and hypotheses

This research project began after the 17th conference of parties (COP-17) under the UNFCCC had taken place in Durban in late 2011. COP-17 decided "to launch a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties."[39] This process should be completed "no later than 2015."[40] This timeframe inspired the design of this research project that aimed to investigate the development of the UN climate regime between 2005, when the Kyoto Protocol entered into force, and 2015 – no matter whether a new document would be adopted or not.

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[38] Brunnée and Toope, based on the theoretical thinking of Lon L. Fuller, suggest eight criteria to consider the legality of international norms and agreements. Chapter two explains this approach to international law in more detail and sets out how the interactional theory benefits the reasoning in this study. *See* also, Brunnée, Jutta, and Stephen J. Toope. *Legitimacy and Legality in International Law: An Interactional Account*. Cambridge: Cambridge University Press, 2010; Brunnée, Jutta, and Stephen J. Toope, "International Law and Constructivism: Elements of an Interactional Theory of International Law," *Columbia Journal of Transnational Law* 39, no. 1 (2001): 19–74. *See* for more detail, subsection 2.4.2.

[39] Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action, Decision 1/CP.17 (FCCC/CP/2011/9/Add.1), 15 March 2012, para 2.

[40] Decision 1/CP.17, para 4.

1.3.2.1. Research question

The research project's subject were the various dynamics that had affected international climate negotiations from the outset and to some degree hampered further cooperation under the UN climate regime. One of these dynamics concerned the interpretation and operationalisation of the CBDR principle, as included in Article 3 UNFCCC as well as in Article 10 of the Kyoto Protocol. The interpretation of the principle in the Kyoto Protocol was particularly contested.

Moreover, the structure of the Kyoto Protocol was criticised, mainly because it determined the commitments of the states parties in a top-down manner. Legal scholars debated the structural deficiencies of the UN climate regime and suggested a shift towards a bottom-up structure.[41] An adjusted approach was foreshadowed in the design of the 2009 Copenhagen Accord, a political agreement that remains outside the UN climate regime. Thus, by considering the operationalisation of the CBDR principle and the design of the commitments the research project sought to examine two structural elements of the UN climate regime. As will be shown, these elements had great impact on the legality of the regime and its substantive provisions.

In addition, the design of this dissertation was inspired by the author's previous experiences in conducting research on energy and its role in international affairs.[42] Indeed, legal scholarship often fails to acknowledge the relevance of energy use for the UN climate regime's evolution. Assessments of the UN climate regime rarely consider the linkages between the transformation of the energy system and global rulemaking to mitigate climate change, despite the fact that by the early 2010s the task of decarbonising energy generation was already a rising trend in the energy sector and widely discussed and analysed in political science research on energy. This research project intended to explore whether the UN climate regime could eventually bring these different worlds together; and it thus examined how the exercise of understanding the UN climate regime from the perspective of the low-carbon energy transition would help to make sense of the regime's substantive development.

Accordingly, with the period from 2005 to 2015 in mind, the project was guided by its main research question:

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[41] *See*, for instance, Bodansky, Daniel, "A Tale of Two Architectures: The Once and Future U.N. Climate Change Regime," *Arizona State Law Journal* 43, no. 3 (2011): 697–712; Diringer, Elliot, "Letting Go of Kyoto," *Nature* 479 (2011): 291–2.

[42] *See*, for instance two papers on the geopolitics of energy, Handke, Susann, "Securing and Fuelling China's Ascent to Power: The Geopolitics of the Chinese-Kazakh Oil Pipeline," Clingendael Energy Paper, August 2006, https://www.clingendaelenergy.com/inc/upload/files/Chinese-Kazakh_Oil_Pipeline.pdf, pp. 1–99; Handke, Susann, and Jacques de Jong, "Energy as a Bond: Relations with Russia in the European and Dutch Context," Clingendael Energy Paper, September 2007, https://www.clingendaelenergy.com/inc/upload/files/Energy_as_a_bond.pdf, 1–78.

How did experiences from domestic climate and energy legislation contribute to a substantive bottom-up reconstruction of the UN climate regime; and how does this reconstruction relate to the CBDR principle?

The research question fully appreciated the dual trends towards a bottom-up approach in the UN climate regime and the decarbonisation of energy generation, including legislative measures to this end at the national level. The research project also sought to assess how these trends would affect the interpretation of the CBDR principle. The project thus studied the influence of national energy and climate legislation and policies on the UN climate regime and the fate of the CBDR principle in parallel, expecting some form of interplay.

The study of these developments obviously required several intermediate steps, expressed in five sub-questions. Three sub-questions were formulated to further guide and structure the research efforts. They concern subjects that are needed to complete the analysis and answer the main research question.

Chapter four gives an overview of the development of the differential treatment in the context of the evolution of international environmental law since the 1970s. By relating the CBDR principle to this historical context, the chapter reflects on the principle's specific position in the UN climate regime and answers the first sub-question:

1. *Which determinants should be considered relevant for assessing the **meaning and role of the CBDR principle** in the UN climate regime?*

Then, chapters five and six proceed with the following two questions:

2. *Does the study of **domestic energy legislation** reveal **indicators** for both a **reconstruction of the UN climate regime** and a reorientation of the CBDR principle?*

3. *Which **top-down elements** are necessary to facilitate a **meaningful reconstruction** of the UN climate regime, based on national regulatory approaches?*

These two questions relate to the interaction that was emerging between domestic energy and climate legislation and the UN climate regime. Sub-question two primarily reflects on domestic developments and the emerging conceptualisation of decarbonisation that chapter five examines. The indicators that chapter five identifies inform the analysis in chapter six, which, guided by sub-question three, compares the indicators with the substantive provisions of the Paris Agreement. It highlights provisions that seek to include a form of top-down oversight in order to control how bottom-up input contributes to the objective of the Paris Agreement. Bottom-up input inevitably touches upon the determinants of the CBDR principle's operationalisation, as it seeks to facilitate differentiation among states parties.

Chapter seven continues the examination of the CBDR principle's role in the UN climate regime. It explores the evolution of the CBDR principle in this regime after 2005 and specifically analyses the principle's redefinition in the Paris Agreement. It also evaluates legality aspects that relate to the operationalisation of the CBDR principle in the Paris Agreement and Katowice Rulebook, by addressing two further sub-questions:

4. *Can the bottom-up reconstruction of the UN climate regime help fulfil Fuller's criteria of **legality**, as applied to international law by Brunnée and Toope?*

5. *Can a redefined CBDR principle in a reconstructed UN climate regime provide **meaningful differentiation** and (continue to) function as a principle of **good global environmental governance**[43]?*

Chapter seven relies on eight criteria of legality that Lon L. Fuller[44] developed and Brunnée and Toope include in their interactional theory of international law. The analysis of the Paris Agreement and Katowice Rulebook, based on these criteria, helps to draw some conclusions regarding the legality of the post-2015 UN climate regime. Moreover, the analysis in chapter seven discusses how the Paris Agreement facilitates a broad consideration of environmental and social aspects in the course of mitigating climate change, by relating the provisions of the Paris Agreement to the

[43] Hey, Ellen, "Common but Differentiated Responsibilities as a Principle of Good Global (Environmental) Governance in the Global Public Realm," in *Liber Amicorum René Foqué*, ed. Marie-Claire Foblets, Mireille Hildebrandt, and Jacques Steenbergen (Ghent: Larcier, 2012), 365–76.
[44] *See*, Fuller, Lon L., *The Morality of Law*. New Haven, CT: Yale University Press, 1969.

precautionary concept as well as climate resilience, climate justice, energy security, and energy justice. Thus, the analysis extends the evaluation of the UN climate regime's substantive evolution beyond the realm of global decarbonisation.

1.3.2.2. Hypotheses

The main research question relates to the reconstruction of the UN climate regime based on experiences with domestic energy and climate legislation. It corresponds with some thoughts that needed to be tested. The research project departed from two hypotheses. Both concern the substance and legality of the UN climate regime:

1. A meaningful reconstruction of the UN climate regime relies on the input of national legislative and policy approaches.

The first hypothesis considers the substantive development of the UN climate regime. The Kyoto Protocol, as the first international legal instrument that entailed provisions to take measures aimed to mitigate climate change, did not keep pace with changing realities. Accordingly, a degree of bottom-up interaction seemed necessary to enhance the regime's substantive quality. The second hypothesis links the quest for substance to the role of the CBDR principle:

2. In contributing to the bottom-up interaction of states parties, the CBDR principle functions as a principle of good global governance and preserves the legality of the UN climate regime.

This hypothesis relates to the origins of the UN climate regime in international environmental law and the role of the CBDR principle in ensuring the regime's legality. Given the Kyoto Protocol's comparatively weak compliance mechanism and a lack of political will to change this, the states parties need to fully embrace the regime's provisions and rely on trust in order be able to engage in international climate cooperation. As will be shown, for their fruitful engagement the legality of the UN climate regime's procedural and substantive norms is vital. Therefore, the operationalisation of the CBDR principle is a key factor in determining the workability of the Paris Agreement, the UN

climate regime's evolution with respect to its objective[45] and its contribution to global environmental governance in general.

1.3.3. Outline

The research question and sub-questions as well as the hypotheses go beyond the realm of international law. The next chapter of this dissertation first explores issues of differentiation among states parties and the decarbonisation of energy generation by presenting a few examples. These examples illustrate the dimensions that contextualise normative responses to climate change. In fact, for a comprehensive understanding of the mitigation task's extent it is important to examine how salient normative, socio-economic, and technological issues interact. To analyse these exchanges, it is appropriate to take an interdisciplinary approach. Chapter two thus describes how this research project was conducted and which theories this dissertation deploys in order to both illuminate the interactions that have shaped the UN climate regime and, subsequently, answer the research question.

Chapter three introduces to the UN climate regime and its historical development. This chapter also includes the positioning of the EU, U.S., and China in relation to the regime during the initial phase of its history. Then, chapter four examines how differential treatment, a tool of managing treaty obligations in a facilitative manner in international environmental law, entered the UN climate regime in the form of the CBDR principle. The chapter also explains how this principle subsequently became one of the most significant and most contested principles of this regime. Chapter five provides an overview of the task of reducing CO_2 emissions, the main part of global efforts to mitigate climate change. It summarises how this task was first conceptualised at the domestic level and translated into policies and legislation in many states; and in an effort to trace and understand this development, it explores the enactment of decarbonisation measures in the EU, U.S., and China. Thus, chapters two to five provide the main context for answering the research question.

The analytical part of this dissertation consists of the chapters six, seven, and eight. Chapter six explains how the centre of the UN climate regime's approach to climate change mitigation eventually moved to national policies and choices, as codified in the Paris Agreement. Chapter seven analyses the evolution of the CBDR principle. This assessment includes the linkage between the CBDR

[45] The UNFCCC states in Article 2 that the "ultimate objective" is to stabilise "greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Article 2 of the Paris Agreement specifies the objective and states that the increase in the global average temperature must be held "to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels."; *see* in more detail chapter three.

principle's redefinition and the reconsideration of climate cooperation under the UN climate regime after the adoption of the Paris Agreement. Chapter eight offers some concluding thoughts. It reflects on recent legislative efforts to implement the Paris Agreement in the EU and presents a structural discussion of how the EU, the U.S. and China are constructing their energy futures. The chapter concludes with an outlook on ideas and concepts that might continue to shape the UN climate regime.

OUTLINE – CHAPTER TWO

Differentiation and decarbonisation: A novel frame of methods and theories to assess the UN climate regime

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CHAPTER TWO

Differentiation and decarbonisation:

A novel frame of methods and theories to assess the UN climate regime

2.1. Introduction

When considering the UN climate regime's evolution, the elements differentiation and decarbonisation stand out. Both issues closely relate to the structure of the regime's treaties, their objectives, and the enactment of international climate cooperation under the UN climate regime. The conceptualisation of the two terms within the regime illustrates how states parties struggled to imagine the task of mitigating climate change and relate it to notions of justice and fairness. These struggles reveal the regime's transformation over the years. This dissertation centres on the concepts of differentiation and decarbonisation. It assesses how the states parties sought to realise a fair burden sharing and how they reconsidered the rules to address the threat of climate change in a more meaningful way.

Differentiation regards the way in which differential treatment[1] was operationalised in the UN climate regime. It played an important role within the regime from the outset. Decarbonisation, however, only entered the regime relatively late. The concept was not part of the debate during the initial rounds of climate negotiations. In 2015, after more than two decades of deliberation, the states parties adopted the Paris Agreement. One of the objectives of this treaty is "to strengthen the global response to the threat of climate change … including by increasing the ability to … foster … low

[1] Differential treatment is a tool that is mainly used in multilateral environmental agreements to facilitate the participation of developing states. Chapter four provides an overview of the history and usage of this tool.

greenhouse gas emissions development."[2] This term implies what is commonly referred to as "low-carbon transition" or "decarbonisation." Both transformations generally point to the changes envisaged for the energy sector. However, pursuing a "low greenhouse gas emissions development" pattern would eventually concern the entire economy. The states parties also agreed that during the second half of the 21st century carbon neutrality[3] had to be achieved.[4] Thus, the idea that global economic activity had to be decarbonised around 2050 was included in the UN climate regime.

This summary shows that over the years the states parties gradually modified both the regime's conceptualisation of climate change mitigation and its approach to differentiation. These processes are the two storylines of this dissertation. They tell how the elements of differentiation and decarbonisation evolved within the UN climate regime and steadily transformed it.

The task of managing international climate cooperation is multifaceted. A multilateral regime that governs the intricate economic, social, technological, and legal issues related to climate change necessarily needs to coordinate and balance rulemaking at the international, national, and local levels. Chapter one mentioned some issues that governments face in the course of both mitigating climate change and coping with the consequences of global warming. Therefore, this research project assessed the UN climate regime's legal and substantive evolution against a multi-layered backdrop.

Accordingly, the dissertation includes aspects of international climate cooperation that border the realm of international law, mainly because the research project also examined how domestic energy policy and law eventually inspired necessary substantive input at the global level. The project's dual and integral national-international perspective helped to track the states parties' search for a meaningful approach to climate change mitigation. It also brought to light the need for considering national circumstances that necessarily inform international lawmaking. The following chapters will show that the conceptualisation of decarbonisation and the re-definition of differentiation within the UN climate regime closely interacted with lessons drawn from the national legislative approaches.

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[2] The drafters of the Paris Agreement chose the formulation of "low greenhouse gas emissions development" and "long-term low greenhouse gas emission development strategies." *See* Articles 2 (1) (b) and 4 (19) of the Paris Agreement, respectively.

[3] Carbon neutrality points to a situation of net-zero carbon dioxide emissions, either by offsetting emissions, removal or avoiding emissions altogether. Thus, if reductions amount to the same total as annual carbon emissions, carbon neutrality is achieved. *See* also, Selin, Noelle Eckley, "Carbon Offset," *Encyclopaedia Britannica*, https://www.britannica.com/technology/carbon-offset#ref1115897.

[4] Article 4 (1) of the Paris Agreement states that the parties "aim to reach global peaking of greenhouse gas emissions as soon as possible […] and to undertake rapid reductions thereafter […], so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century." The drafters of the treaty, conscious of the scope of the UNFCCC, which addresses the emissions of several gases, did not choose for the term decarbonisation. Given the dominance of carbon dioxide as cause of global warming, this provision essentially expresses the notion of carbon-neutrality – i.e. the outcome of decarbonisation, as removals by sinks or other means, based on technology that was available in 2015, are largely negligible.

The next section summarises how this research project contextualised the UN climate regime. Throughout the history of the UN climate regime, the understanding of climate change and ways to address global warming have been changing. The section introduces three dimensions that help appreciate the regime's evolution. It also presents some examples to explain the regime's limited ability to guide the states parties towards a timely, significant, and thorough response to global warming. The examples encapsulate the debates that have been shaping the UN climate regime's development for decades. Section three then summarises the methods and main elements of the theoretical framework, which were used to investigate the topic and find answers to the research question and the subsidiary questions that chapter presented. Thus, the following two sections outline this dissertation's storylines as well as theories and methods that this dissertation deploys to narrate its account.

2.2. Contextualising the UN climate regime

When this research project started in the early 2010s, the low-carbon transition had already begun in many states. As a consequence, various social issues resulting from governments' policy choices to engage in this transformation had already emerged and featured in political debates in many states. These debates led to frequent adjustments of energy legislation.

In addition, global warming had become a fact of daily life when this dissertation was being written. The news about demonstrating and climate-striking pupils read like reflections of the salient concept of intergenerational justice that, a few decades ago, only sounded familiar to legal scholars who studied and analysed international climate negotiations. By the mid-2010s, climate change was real and the imagination of a global response was in flux.

During the final months of 2018 the international and national spheres intersected in dramatic ways: Inspired by Greta Thunberg, a Swedish teenage girl, pupils took to the streets in many cities to demand more ambitious and immediate climate measures, while international negotiators gathered at the annual conference of parties (COP-24) in Katowice, Poland. It was the 24th of its kind. The region of Silesia was chosen to host COP-24, because it highlights the socio-economic challenges that coal-producing regions face in the process of the energy transition.[5]

[5] The Silesia Declaration on Solidarity and Just Transition, a political statement, was signed by many government representatives during COP24. *See*, Just Transition Declaration, https://cop24.gov.pl/presidency/initiatives/just-transition-declaration/.

No doubt, in 1992, when international climate cooperation began, none of the negotiators expected that, within only three decades, the issue of intergenerational justice would materialise in protests from Albury, Australia, to Zurich, Switzerland.[6] The global protests continued throughout the following months and culminated in the filing of a complaint by 16 children from Asia, Africa, Europe, Oceania, North America, and South America to the United Nations Committee on the Rights of the Child, protesting the lack of government action on the climate crisis.[7]

Still, the young protesters' and plaintiffs' impatience with the inaction or even brutal denial of world leaders in the face of global effects of changing climate patterns can hardly be reconciled with concerns and anxieties on the part of pitmen and their families in fossil-fuel extracting regions. Politicians have been trying to balance these issues for decades, primarily by delaying actions that would dramatically transform the basis of the global fossil economy. How has this predicament been shaping the UN climate regime since its establishment in 1992?

Indeed, a novel framework of methods and theories is needed in order to realise how the UN climate regime interacted with domestic rulemaking and to appreciate the difficulty to design a response to global warming through international rulemaking that can take into account both the desperation that drives the pupils' protests and the fear of socio-economic decline in local communities and entire economies that rely on the extraction and use of fossil fuels.

Accordingly, this dissertation expands the assessment of the UN climate regime beyond the realm of legal analysis, by including three dimensions that help to broaden our perspective – i.e. *time*, *imagination*, and *complexity* (*see* figure 2.1). These three dimensions form the main threads that weave this dissertation's fabric. By shrouding the storylines of differentiation and decarbonisation into this fabric, the dissertation is able to narrate the regime's legal and substantive evolution in a different way.

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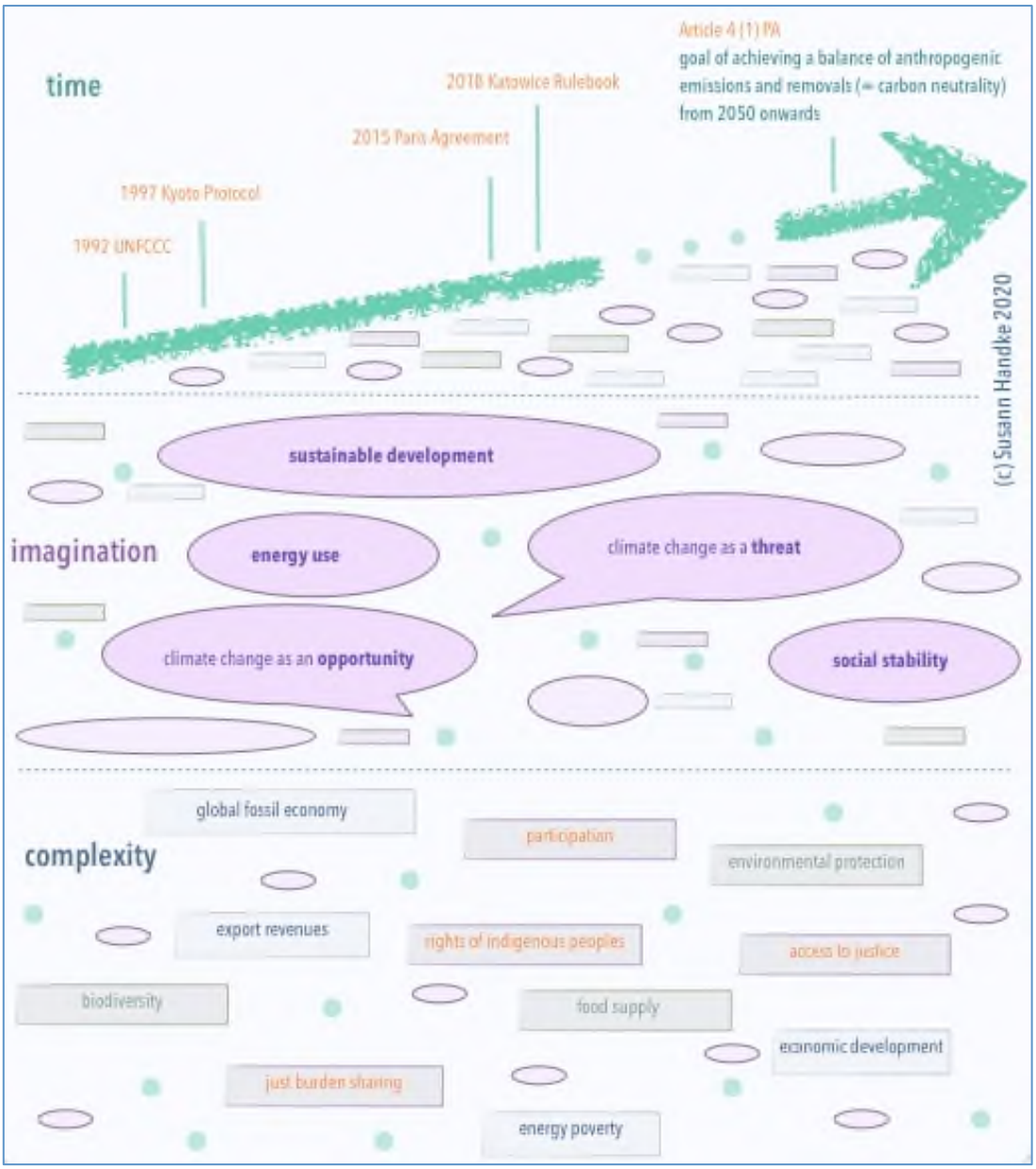
[6] In late 2018, the movement "Fridays for Future" emerged and saw pupils protests in many cities on several continents. On 15 March 2019, this movement inspired worldwide protests in which more than 1,600,000 teenagers participated when they joined "Fridays for Future" in cities in 81 states in Africa, the Americas, Asia, Australia, and Europe. *See*, "Fridays for Future," https://www.fridaysforfuture.org/events/list.

[7] UNICEF – Press Release, "16 Children, Including Greta Thunberg, File Landmark Complaint to the United Nations Committee on the Rights of the Child," 23 September 2019, https://www.unicef.org/press-releases/16-children-including-greta-thunberg-file-landmark-complaint-united-nations; Earthjustice, "16 Young People File UN Human Rights Complaint on Climate Change," 23 September 2019, https://earthjustice.org/news/press/2019/un-committee-on-the-rights-of-the-child-receives-first-ever-human-rights-complaint-on-climate-change; see also the text of the petition that has been directed against Argentina, Brazil, France, Germany, and Turkey, "Communication to the Committee on the Rights of the Child – In the Case of Chiara Sacchi (Argentina); Catarina Lorenzo (Brazil); Iris Duquesne (France); Raina Ivanova (Germany); Ridhima Pandey (India); David Ackley, III, Ranton Anjain, and Litokne Kabua (Marshall Islands); Ayakha Melithafa (South Africa); Greta Thunberg and Ellen-Anne (Sweden); Raslen Jbeili (Tunisia); & Carl Smith and Alexandria Villaseñor (USA); Petitioners, v. Argentina, Brazil, France, Germany & Turkey, Respondents." 23 September 2019, http://blogs2.law.columbia.edu/climate-change-litigation/wp-content/uploads/sites/16/non-us-case-documents/2019/20190923_Not-available_petition-1.pdf.

Figure 2.1: Dimensions that contextualise normative responses to climate change



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The dimensions of *time*, *imagination*, and *complexity* stress the need for a multipronged approach to international climate cooperation and help to evaluate the UN climate regime's capability to fulfil this requirement at the different stages of its evolution. Figure 2.1 does not represent any research finding. Rather, it invites the reader to ponder on the linkages between various issues that are influenced by the dimensions of time, imagination, and complexity in the context of global efforts to

regulate international climate cooperation. It essentially shows that over the years an increasing number of urgent matters (*squares* in figure 2.1) entered the climate debate, while people associated ever more issues with the changing climate (*ellipses*). The time compartment of figure 2.1 highlights that urgent matters and thoughts about climate change are becoming ever more numerous as 2050 is nearing.

Accordingly, the three dimensions cast new light on some interrelated issues; and considering the dimensions' interaction helps to explore the dynamics that shape the rules of the UN climate regime as well as the circumstances under which they have to be implemented. The conclusions of the following chapters will reiterate the dimensions and link them to the topic of the respective chapter.

By following the threads of time, imagination, and complexity throughout the UN climate regime's history, this dissertation presents a comprehensive account of the UN climate regime's evolution that includes various interdependencies. From the outset, shifts in the global economy, societal preferences, and technological progress have influenced international climate cooperation. Therefore, the maintenance of a global legal framework on climate change requires adjustments to its rules in order to respond to changing circumstances.

In the following subsections, the three dimensions illuminate the context in which the UN climate regime developed. The purpose of introducing these three dimensions at this point is twofold. First, the reference to the three dimensions stresses the need for an interdisciplinary theoretical approach to study the UN climate regime, which the next section of this chapter will further elaborate. Second, to describe the dimensions' relevance some examples are presented that help to contextualise the findings in the analytical part of this dissertation and bring a fresh perspective to the account.

2.2.1. Time

The dimension of time reminds us of the historical circumstances in which some of the concepts emerged that shaped cooperation under the UN climate regime – such as distributive justice, market liberalisation, and sustainable development.[8] These concepts partly trace their roots to debates linked to the decolonisation movement during the 1960s and 1970s and responses to these debates

[8] Chapter three explains how these concepts relate to the UN climate regime and how they shaped the regime, especially the earlier phases of its evolution.

that had an effect on policymaking from the 1980s onwards. These discourses continued to influence international law for decades to come.[9]

During early 1990s, when the UN climate regime was conceived, political and economic ideas and their institutionalisation were in a state of flux. Thus, the regime was negotiated and established during the turbulent and sometimes euphoric period of international cooperation following the end of the Cold War. Rulemaking to combat climate change coincided with the introduction of neoliberal economic policies in both developed and developing states,[10] enhanced economic globalisation, and the beginning of China's integration with the global economy.[11]

With the Kyoto Protocol's entry into force in 2005, the regime entered its maturing phase. At the same time, the global economic situation was changing fast and dramatically. Following rising oil prices and technological advances, the global energy business experienced an unpredicted (and unprecedented) overhaul. Both the production of unconventional oil and gas[12] and the deployment of renewables became economically viable. These developments altered the perception of measures that would be necessary to address climate change. New solutions became feasible, both in terms of deployment costs and technological challenges. These changes also clarified how fast energy generation, especially the generation of electric power, could be decarbonised. Partly as a result of these technological and economic shifts, the Kyoto Protocol was rendered outdated before the cooperation that it envisaged really took off. Not even its flexibility mechanisms were able to catch up with the changes.[13] These developments necessarily informed the negotiations about a post-2012 arrangement[14] in which the states parties eventually agreed on a new instrument under the UNFCCC for the period after 2020.

The energy transition also involves time as a factor. Once suitable technological solutions are available to transform the energy system, long lead times require careful planning of infrastructure construction, such as solar and wind parks and transmission lines, while new institutions have to be

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[9] Chapter four discusses how these debates affected the development of international law. Differential treatment for developing states under multilateral regimes is an outcome of these debates. The chapter focuses on how differential treatment for developing states, including the CBDR principle in the UN climate regime, developed together with international environmental law.

[10] *See* on the impact of liberalisation policies on the electricity sector, chapter five and this sector's importance for the reduction of greenhouse gas emissions.

[11] Globalisation and China's economic rise, accelerated by the country's accession to the WTO in 2001, were important factors for the rapid increase greenhouse gas emissions globally and in China from the turn of the century onwards. *See* in more detail, chapter five.

[12] The term unconventional oil and gas is used for extra heavy oil, oil sand, oil shale, tight gas, coal bed methane, shale gas, and natural gas hydrates. Processes and technologies that are needed to develop and obtain these resources are different from those that are used to produce conventional oil and gas. They differ with respect to the necessary energy input, the costs that are involved, and the environmental impact of the production processes. *See* for a brief overview, IEA, "Unconventional Oil and Gas Production," *IEA-ETSAP Technology Brief*, May 2010, https://iea-etsap.org/E-TechDS/PDF/P02-Uncon_oil&gas-GS-gct.pdf, pp. 1–7.

[13] Chapters five and six focus on the development of the global energy situation in the context of regulating climate change mitigation.

[14] The first so-called commitment period under the Kyoto Protocol lasted from 2008 to 2012. During this period, developed states had to reduce their greenhouse gas emissions by specified percentages. Chapter three provides an overview of the history of the UN climate regime.

created to manage the implementation of the low-carbon energy transition. The entire process of decarbonising economic activity necessitates laws that need to be amended as soon as technological advance and changing societal preferences call for adjustments.

Finally, the time dimension in the debate about a global response to climate change alludes to the political zeitgeist. As mentioned above, during the 1990s the threat seemed very distant and the consequences of climate change were not yet felt. The debate centred upon the need to act in a timely manner in order to ensure that future generations get a "fair" share of the planet's resources, including the atmosphere. As the examples in chapter one illustrated, by late 2018 climate change was real and could be felt in most parts of the world. In order to contain global warming, societal, economic, and political actors engaged in serious debates to find and choose solutions and accelerate the implementation of related policies. The change in mindset is recognisable in the focus of the public debates that took place during the 1990s and late 2010s.[15] These debates also exemplify how the dimension of time correlates with another dimension of global climate action – i.e. the imagination of climate change and its mitigation.

2.2.2. Imagination

The dimension of imagination forms the second thread that contributes to the fabric of this dissertation. It concerns the construction of climate change and the conceptualisation of climate measures, especially related to their social acceptance. These processes take place at local, national, and international levels. Unsurprisingly – and related to what was said in the previous subsection – the imagination of climate action evolves over time; its contours are malleable.

The dimension of imagination is continuously interacting with energy and climate lawmaking. In fact, when options are explored of how to design and structure the content of legal frameworks to implement climate measures it matters profoundly how society or particular social groups perceive both climate change and the proposed solutions to the problem. Over the years, efforts to combat climate change, especially those directed towards energy policy, became an important part of life. They began to affect many aspects of structuring social relations.[16] Social scientists' growing interest

[15] During the 1990s and beyond, climate change mitigation was considered to be limited to installing technologies that can reduce emissions. No one really foresaw the far-reaching transformation that would be needed. During the 2010s, however, this transformation had already started. Climate change mitigation was not only discussed as an issue of emissions reduction but also in the context of the socio-economic effects that it has on the countries that embarked on the energy transition.

[16] Goodman, James, and Jonathan Paul Marshall, "Problems of Methodology and Method in Climate and Energy Research: Socialising Climate Change?," *Energy Research and Social Science* 45 (2018): 2.

in the nexus between energy, climate change, and social practices illustrates this vital interaction.[17] For lawyers who seek to fathom the linkages between climate change and normative developments, it is useful to scrutinise the work of sociologists who specialise in energy matters, mainly because their findings highlight how social ecosystems are affected by and respond to climate measures.[18]

Since the early 1990s, climate change and society have been interacting in three different ways, leading to three sources of societal change.[19] First, *governments themselves fulfilled a form of climate agency*, when they responded to the threat either by taking into account societal pressures and/or reports by the IPCC about the dangers of climate change or by ignoring these developments and simply continuing to promote fossil-fuel based economic development. Government's choices subsequently determined a society's positioning in its search for climate stability.[20] Thus, policy choices in the wake of the first warnings and the adoption of the UNFCCC created a legacy of "stabilisation" measures with which societies have been interacting.

Second, *global warming increasingly affects societies*. The examples in chapter one showed that extreme weather events, as the most tangible consequences of climate change, cause significant economic damage, disrupt people's daily lives or even destroy their livelihoods. Thus, climate change "remakes society." [21] The effects of global warming re-cast social relations and necessitate adjustments to socio-economic policies. Simultaneously, the changing physical circumstances – shifting weather patterns and their impact on the environment – modify shared understandings among people about the need to take action and the urgency thereof. Evolving shared understandings continue to inform climate politics, leading to further reassessments of government policies and legislation.

[17] *See*, for instance, the journal *Energy Research and Social Science*, https://www.journals.elsevier.com/energy-research-and-social-science, which is dedicated to interdisciplinary research and scholarly debate on matters that concern society and energy use and policy.
[18] Chapters five and seven will show that this exercise is also vital for international lawyers when they seek to understand the development of the UN climate regime.
[19] Goodman and Marshall, 2018, 2–3.
[20] The term climate stability refers to a meaningful response to global warming and concerns a society's ability to change in order to ensure climate mitigation and adaptation to the consequences of global warming. *See*, Goodman and Marshall, 2018, 3.
[21] Ibid.

Finally, *the decarbonisation of energy generation* – as the initial, main effort to reduce CO_2 emissions – *greatly influences social relations*. Decarbonising energy generation remodels society, mainly because this process restructures many economic patterns and social practices that emerged with the fossil-fuel based economy.[22] A particular brand of social practices evolved with socio-economic relations that were based on the extraction and utilisation of fossil fuels.[23] Emerging patterns of climate stability, however, are continuously renegotiated as a result of ongoing global warming. In this process, domestic laws and policies play a vital role in responding to societal challenges.

Since energy consumption and the socio-technical infrastructure are part of a society's material culture, a profound transformation of the energy system directly influences the material culture of a country or society. Yet, patterns of energy production and consumption differ from place to place.[24] Energy consumption follows the pulse of society and is linked to most of the things that people do throughout the day.[25] Socio-cultural factors, a country's economic history, and its path to the fossil-fuel based economy condition these processes. Therefore, the energy transition unfolds differently in each country; and people's behaviour that shapes these transformative processes does not follow rational models. Societies continue to have different energy cultures that cannot solely be changed by regulatory incentives and market signals.

Policy decisions interact and reverberate with imagination that shapes ideas, rather than being driven by available technologies or "ideal" market models for the design of regulatory frameworks. Accordingly, the socio-cultural context plays an essential role in the construction of climate change and viable responses. The dimension of imagination forms the ideational basis of the difficult quest for a normative balance between the international impetus for ambitious climate action and the

[22] Section 5.4. of chapter five discusses the ideational content of the low-carbon transition and its relationship with the fossil economy.

[23] In summary, Elizabeth Shove and Gordon Walker explain the function of energy in society. Energy demand is connected with the "temporal rhythm of society and with what people do." Furthermore, material arrangements shape the way in which energy demand is satisfied. This includes the infrastructure that produces and transports energy to end users and the devices that utilise energy for consumption. Accordingly, energy demand is embedded in social practices. This realisation is essential when considering the large-scale change of these patterns that is involved in climate and sustainability policies. *See*, Shove, Elizabeth, and Gordon Walker, "What is Energy for?: Social Practice and Energy Demand," *Theory, Culture and Society* 31, no. 5 (2014): 54–6.

[24] Lutzenhiser, Loren, "A Cultural Model of Household Energy Consumption," *Energy* 17, no. 1 (1992): 54, 55.

[25] The use of energy is closely related to culture, social practices, and historical trajectories. The reduction of energy-related CO_2 emissions depends on the behavioural changes. These changes require individuals, groups, and entire societies to adjust their energy use patterns. Individuals' behaviour corresponds to their membership in certain cultural groups, policies and legal norms need to take into account such cultural groups as the primary entities that shape the use of technologies, practices, and meaning related to energy consumption. Thus far, diverging energy cultures were responsible for a diversity of policy outcomes, when similar measures are implemented under comparable material conditions. Considering energy cultures is vital when attempting to change energy use patterns. *See*, Stephenson et al, "Energy Cultures: A Framework for Understanding Energy Behaviours," *Energy Policy* 38, no. 10 (2010): 6120–9.

environmental, social, and economic costs of far-reaching socio-technical transitions that occur at the local and national levels.[26]

A broad range of socio-economic and environmental factors influences the social construction of climate change and available mitigation measures. In many countries, society's reaction to climate change has been oscillating between a feeling of relative distance and a dreadful immediacy of the threat. People reluctantly embraced climate policies; and more often than not protests against proposed mitigation measures delayed or even precluded their implementation. The quest for social stability seems to clash with radical climate measures. Eventually, the task of considering environmental impacts of renewable energy sources is as important as ensuring societal support for mitigation measures.

No government can afford to ignore the multifaceted societal changes that are unfolding in a climate-constrained world. This brief overview has shown that societal, historical, and cultural aspects as well as perceptions of social justice determine how people imagine both the threat of climate change and mitigation options. In section 7.4. of chapter seven, this dissertation presents a triangular framework, consisting of the precautionary concepts, climate justice, climate resilience, energy security, and energy justice. Correlating this framework with the provisions of Paris Agreement and the Katowice Rulebook reveals the increasing importance of these concepts for the imagination of national measures to mitigate climate change as well as international climate cooperation.

Evolving shared understandings shape normative choices, such as laws that aim to regulate the procedures for closing fossil-fuel based facilities or building infrastructure to utilise renewables.[27] Since shared understandings regarding these matters vary in different regions of the world, from country to country, and among social groups, it takes time to arrive at globally shared understandings that can form the basis of international rules on climate change mitigation.

[26] Chapter three discusses the issue of the perception of the climate change threat and its influence on domestic policies in the EU, U.S., and China. Chapter five examines energy transition policies and their acceptance in these three jurisdictions; and chapter seven looks at the international level and considers how the imagination of climate change and its mitigation relates to climate action under the Paris Agreement and Katowice Rulebook.

[27] Chapter five relates the decarbonisation of the power generation in the EU, U.S., and China to the social construction of climate change.

During the first two decades of the UN climate regime's history, lawmaking at the international and national levels insufficiently acknowledged that both the imagination of the climate change problem and the reduction of greenhouse gas emissions pertain to notions of justice and stability.[28] Gradually, ever more matters became part of the climate debate. Yet, making norms to deal with climate change while paying more attention to social issues increases the task's complexity. The next subsection considers this third dimension that characterises the international climate action.

2.2.3. Complexity

Measures proposed by governments that aim to reduce greenhouse gas emissions frequently affect related social and environmental policies at national and local levels. In addition, they have to be in line with general economic regulation. The previous two subsections showed that international rules can hardly take into account the full extent of the time and imagination dimensions with respect to climate change. No doubt, only an interplay of different layers of lawmaking can address the *complexity* of climate change and its mitigation.

The low-carbon energy transition entails an epochal transformation. It tears apart the interrelationships that have been the basis of the global fossil economy for more than 200 years. During this period, demand for fossil fuels has shaped economic relations and trade patterns. From the first half of the 19th century onwards, the utilisation of coal facilitated global economic exchange. After World War II, oil replaced coal as the main fuel in the transport sector and enabled even faster shipments of goods and global mobility.[29] Hence, decarbonisation is redefining the foundations of economic globalisation. This process is open-ended. Maintaining stability under such circumstances becomes as an arduous task.

The notion of stability in this regard concerns international relations, domestic political affairs, society as whole, as well as each individual. The low-carbon energy transition affects international trade patterns and national economic strategies, while at a very personal level each household has to adjust its energy use.

[28] Chapter seven of this report reflects on these issues when it assesses the parameters for future international climate cooperation that the Paris Agreement entails.

[29] *See* for a comprehensive overview of the role that oil played in the global economic history of the 20th century, Yergin, Daniel, *The Prize: The Epic Quest for Oil, Money, and Power*. New York, NY: Free Press, 1990.

The increasing deployment of renewables and energy efficiency measures gradually create a new socio-economic, technological, and regulatory reality. Still, the fossil economy will not disappear any time soon. States that rely on revenues from the export of fossil fuels are less inclined to accelerate the energy transition than importing economies. There are many reasons for dissonance. These issues relate to the geopolitical impact of the low-carbon transition.[30]

In the context of this research project, the dimension of complexity primarily pertained to two global challenges and their normative aspects. First, governments have to reduce greenhouse gas emissions and manage the slow demise of the fossil economy. Second, in the course of international climate cooperation clarity is needed with respect to a fair burden sharing. This requirement concerns both the effects of global warming and the contribution to the low-carbon transition.[31]

The example of Norway's proposed path to carbon neutrality helps illustrate the shift from an economy based on fossil riches to a non-carbon future. The country's new energy policies rely on wind parks next to hydropower. Some of the wind parks are located in remote minority areas. The construction of the Storheia onshore wind park demonstrates the gravity of the issues at hand and explains how the dimension of complexity can help inform the analysis of legal norms that address climate change and regulate the decarbonisation of energy generation (*see* textbox 2.1).

[30] *See* for a discussion of the geopolitical changes that are brought about by the increasing deployment of the renewables and possible policy responses, Scholten, Daniel, ed., *The Geopolitics of Renewables*. Cham: Springer Nature, 2018.
[31] Chapter seven shows that the climate justice and energy justice relate to decision-making at both the national and international levels.

Textbox 2.1: Norway's conceptualisation of the low-carbon transition

Norway: Wind lashing against indigenous rights

Pursuant to the UNFCCC and Kyoto Protocol, developed states had to take the lead in reducing global greenhouse gas emissions, while the issue of fair burden sharing followed the dichotomy between developed and developing states.[1] The Paris Agreement, however, encourages each individual state to determine within its national context what an "ambitious" climate policy means, related to the global goal that seeks to limit global warming to 2°C compared to pre-industrial levels.[2]

A few months after the adoption of the 2015 Paris Agreement, a majority of Norway's law-makers approved a resolution that aims to achieve carbon neutrality of the Norwegian economy by 2030. At the time of voting, Norway's CO_2 emissions were slightly higher than in 1990, the base year for determining reduction commitments under the Kyoto Protocol.[3] Thus, achieving carbon neutrality – i.e. zero net emissions – within only one and a half decades would involve large-scale investments and enormous efforts to construct infrastructure that facilitates low-carbon energy generation.

Although the construction of wind farms had only begun in 2002, the effects of the energy transition on Norway's economy were already tangible by the time that the Norwegian parliament adopted this resolution. The environmental and social costs of deploying renewables were immense; and the generation of wind power increased significantly.[4]

Any further expansion of wind power in the country was not really necessary for domestic demand or emissions reductions in the electricity sector, mainly because Norway's electricity consumption already relied for about 96% on hydropower.[5] Yet, the Norwegian government eagerly embraced wind power and measures to offset CO_2 emissions, such as the carbon capture, storage and utilisation technology, and emphasised its willingness to follow the global trend towards decarbonisation. Indeed, after decades of selling crude oil and natural gas to its neighbours in western Europe many saw Norway as an exporter of "green" electricity and the "battery" of Europe, using renewable sources of energy and the capacity of its large hydropower storage reservoirs.[6]

Norway's case illustrates the difficult choice between the economic opportunities that the low-carbon energy transition offers and the challenging societal context of this transformation. Despite growing environmental and social concerns, electricity producers continued to increase the country's wind power capacity. Issues such as rights of vulnerable groups and access to justice played an increasingly important role during this phase of Norway's energy transition.

(continued)

Norway: Wind lashing against indigenous rights *(continued)*

These concerns became particularly evident in the case of the Storheia onshore wind park.[7] The construction of 81 wind turbines on the Fosen peninsula threatened the livelihood of southern Saami reindeer-herding communities, as they would lose about 44 percent of their winter pastures.[8] The Saami brought this case to court.[9] Nevertheless, the Norwegian government decided to continue the construction of the wind park, mainly because all necessary procedures had been completed and permissions had been obtained in accordance with the law.[10]

However, the government had not taken into account recent reports, which showed that wind power generation in grazing areas is harmful to reindeer.[11] Furthermore, it ignored international protests that highlighted the marginalisation of the Saami community and the destruction of their livelihood as a result of the wind park project.[12] Still, in June 2018 the High Court decided that the construction of the wind park could continue while it was considering the question of how to compensate the Saami. According to the judges, the developer's financial situation and the interests of investors were more important than the position of the Saami. Eventually, the narrative of both creating economic opportunities and contributing to the mitigation of climate change had won the argument and also found overwhelming support among the non-Saami public.[13]

Notes:

1 - *See*, Articles 3 (1), 4 (2) (a) UNFCCC; Articles 2 (1) (a), 3 (1) KP.
2 - *See*, Articles 2 (1) (a), 3, 4 (2) PA.
3 - In accordance with Annex B of the Kyoto Protocol, Norway was allowed to stabilise its greenhouse gas emission at 101% of 1990 levels. *See* also, Article 4 (2) (b) UNFCCC.
4 - By the end of 2017, its total installed wind power capacity had reached 1.188 MW; and wind power installations equivalent to 5.4 TWh were under construction. Based on public investment decisions as of late 2017, Norway's installed wind power capacity will increase to almost 8 GW by 2021. *See*, 2017 IEA Wind TCP Annual Report, "Norway," https://community.ieawind.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=ce784245-b440-8dd7-0c1b-893157bd1a6d&forceDialog=0, pp. 124, 127; Energy Facts - Norway, "Electricity Production," https://energifaktanorge.no/en/norsk-energiforsyning/kraftproduksjon/.
5 - Energy Facts - Norway, "Electricity Production," https://energifaktanorge.no/en/norsk-energiforsyning/kraftproduksjon/.Energy Facts - Norway, "Electricity Production," https://energifaktanorge.no/en/norsk-energiforsyning/kraftproduksjon/.
6 - Norway produced 149.3 terawatt hours (TWh) of electricity in 2017 and consumed 134.1 TWh. In that year, Norway's net electricity export was 15.2 TWh, which is roughly 1.5 times of Oslo's annual electricity consumption (9 TWh). In 2016, EU Commission Vice President for the Energy Union Maroš Šefčovič emphasised Norway's contribution to the EU's energy security alluding to the "Norwegian battery." *See*, Government.no, "Renewable Energy Production in Norway," 11 May 2016, https://www.regjeringen.no/en/topics/energy/renewable-energy/renewable-energy-production-in-norway/id2343462/; Wettengel, Julian, "Norway Bets on Gas and CCS to Complement Europe's Energy Transition," 31 August 2018, https://www.cleanenergywire.org/news/norway-bets-gas-and-ccs-complement-europes-energy-transition; Šefčovič, Maroš, "The Norwegian Battery," 4 March 2016, https://ec.europa.eu/commission/commissioners/2014-2019/sefcovic/blog/norwegian-battery_en.
7 - Storheia wind park is located on Fosen peninsula at the west coast of Norway. Together with five other wind park, it forms Fosen Vind - with 1057 megawatt (MW) Europe's largest onshore wind park. To be completed in 2019, Storheia would be the largest among the project's wind parks. Its 80 wind turbines, Storheia would have an installed capacity of 288 MW. *See*, Fosen Vind, "Vindparkene," https://www.fosenvind.no/vindparkene/; Fosen Vind, "Storheia vindpark," https://www.fosenvind.no/vindparkene/storheia-vindpark/.
8 - Society for Threatened Peoples, "Turbines Need Sami Consent!: Norway - The Construction of a Wind Power Plant on the Sami Winter Pastures in Storheia," December 2018, https://www.gfbv.ch/wp-content/uploads/sami_fact-sheet_layouten-def.pdf, p. 3
9 - Lasnes, Arim B., "Saami Reindeer Herders Fight Wind Farm Project," *Arctic Deeply*, 20 April 2016, https://www.newsdeeply.com/arctic/articles/2016/04/20/saami-reindeer-herders-fight-wind-farm-project.
10 - Saami Council, "Confound by Norway's Disrespect of the CERD's Request in the Fosen Case," 28 December 2018, http://www.saamicouncil.net/en/article/confound-by-norways-disrespect-of-cerds-request-in-the-fosen-case-1/.
11 - Nilssen, Trond Risto, "South Saami Cultural Landscape under Pressure," in *Historical and Political Perspectives on a Minority within a Minority*, ed. Håkon Hermanstrand et al (Cham: Springer Nature, 2019), 179.
12 - The UN Committee on the Elimination of Racial Discrimination had asked Norway to suspend the Fosen wind park project, as the Committee wanted to examine a complaint that local reindeer herders had filed. However, since the project had passed all domestic checks the Petroleum and Energy Ministry announced that the project could proceed. *See*, Karagiannopoulos, Lefteris, "Norway to Build Wind Farm despite Concerns of Reindeer Herder," Reuters, 21 December 2018, https://www.reuters.com/article/us-norway-wind-un/norway-to-build-wind-farm-despite-concerns-of-reindeer-herders-idUSKCN1OK1WS.
13 - Nilssen, 2019, 182-3.

As the example of the Storheia wind park shows, the low-carbon energy transition often forces policymakers and lawyers to choose between long-term energy relations, a country's position in the (future) global energy business, lucrative foreign investments, technological leadership, and the interests and rights of vulnerable constituencies. An adaptable legal framework can accommodate changing priorities and acknowledge that these choices are continuously renegotiated at local and national levels in the context of domestic political and socio-economic shifts. Hence, local and national circumstances largely define the nature and scope of measures to mitigate climate change as well as the pace of their implementation, while fair burden sharing constitutes an issue that pertains to every single step in this global transformation.

The Norwegian example of deploying renewables in a remote area in order to accelerate the low-carbon transition raises several normative questions that reflect the complexity of the topic. First, given Norway's international obligations is it worthwhile to destroy pristine ecosystems or parts of an indigenous culture and people's livelihoods for only reducing a relatively small percentage of global emissions? Second, what are the benchmarks for defining fair burden sharing in the context of international climate cooperation? Is fairness only considered at the international level or should the issue of fair burden sharing also be taken into account at the national and regional levels? And if so, how is fairness conceptualised in this regard? Is Norway, a developed state and major oil and gas exporter, obliged to contribute much more to the production of low-carbon electricity than its neighbours, regardless of domestic frictions that might call for a reconsideration of a project such as the Storheia wind park? Finally, how can basic concepts such as the rule of law, access to justice, and legal certainty for investors be upheld in a climate-constrained world where fast action is key to survival?

These questions underline the intricate interaction of legal, political, socio-economic, and environmental issues in the course of mitigating climate change. This interaction takes place against the backdrop of a global capitalist order that is founded on the use of fossil fuels. Conceptualising fair burden sharing in this respect is particularly challenging, because it was the very existence of unequal social relations that enabled the emergence and persistence of the "fossil economy."[32]

The fossil economy also formed the basis for the neoliberal global economic system. Since the late 1970s, neoliberal thinking has been the prevalent ideology to organise international economic

[32] Capitalism created the fossil economy in Great Britain at the national level and, beginning in the 19th century and in the wake of colonisation, it was responsible for spreading fossil fuel utilisation to other continents. *See* for a thoughtful analysis, Malm, Andreas "Who Lit This Fire?: Approaching the History of the Fossil Economy," *Critical Historical Studies* 3, no. 2 (2016): 215–48.

relations. This school of economic thought also left its mark on the organisation of modern energy systems as well as the design of the UN climate regime. The Kyoto Protocol in particular was inspired by neoliberal thinking.[33] Thus, after having discussed social stability and fairness, neoliberal thought – embedded in capitalist industrial relations – is the last building block of the complexity dimension that this dissertation includes in its analysis.

The ideational force of neoliberalism greatly influenced the development of the UN climate regime. First, neoliberalism thrived as a response to the 1970s debates on development at the UN General Assembly, which, on their part, had inspired salient concepts of international environmental law.[34] This resulted in a deep-rooted contradiction that affected the construction of the UN climate regime's instruments and its global implementation, as the following chapters will show.[35]

At national levels, neoliberal economic theory determined rules for the restructuring of the electricity sector in both developed and developing states during the 1990s that subsequently became the regulatory framework of the low-carbon transition of the entire energy system.[36] As a result, initial efforts to mitigate climate change faced the ideational impact of neoliberal thought in three forms – as remnants of the fossil economy, through some instruments of the UN climate regime, and in national legal frameworks that regulate the energy system, especially the electricity sector.

However, at the time when the Paris Agreement was adopted in 2015 some of the premises of organising economic relations in line with neoliberal thought were increasingly questioned. Indeed, the Paris Agreement and the Katowice Rulebook leave some room for the complexity of climate change beyond the rationality of market relations,[37] despite the fact that neoliberal capitalism remains the predominant socio-economic context of rulemaking on mitigating climate change.

Knowledge of trade patterns, norms, and financial flows that still foster the capitalist fossil economy is essential when imagining how to abandon or transform the global interdependencies of the fossil economy. Furthermore, it is critical to understand that the incumbent energy system maintains structures of inequality and injustice in national economies and at the global level.[38]

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[33] Chapter six discusses how market mechanisms sought to shape climate cooperation under the Kyoto Protocol and failed to deliver most of the objectives that initially justified their inclusion.
[34] *See* in more detail, chapter four.
[35] *See* in more detail on the instruments chapters six and chapter seven on the cycle of normative change that was required to adjust the UN climate regime's approach to fair burden sharing.
[36] These developments are discussed in chapter five.
[37] Section 7.4. of chapter seven introduces a triangular framework that depicts the components of climate cooperation that the Paris Agreement includes.
[38] Brown, Benjamin, and Samuel J. Spiegel, "Coal, Climate Justice, and the Cultural Politics of Energy Transition," *Global Environmental Politics* 19, no. 2 (2019): 151.

In its essence, the global fossil economy is a stereotypically "masculine" endeavour.[39] Imaginaries that come with fossil fuel exploration, extraction, transport, and combustion manifest its social construction.[40] An analysis of the UN climate regime after the adoption of the Paris Agreement necessarily has to assess whether this agreement creates a framework in which, through interaction,[41] the complexity of climate change mitigation can be appreciated beyond "masculine" discourses that primarily envision the transformation of the energy system as new technologies, large-scale economic instruments and applications, and complex computer modelling.[42]

The acknowledgement of broader societal contexts in which climate change mitigation takes place alters the boundaries of the legal analysis: It allows or even demands the inclusion of ideational shifts and the consideration of whether – and to which degree - the legal regime enables societies to (re)define their positioning in international climate cooperation, through national and international avenues.

Since the adoption of the UNFCCC in 1992, the UN climate regime's approach to mitigation has been shifting. At different moments in time, certain matters emerged and left their mark on the negotiation process and disappeared again, while other issues, especially the way in which a fair burden sharing can be achieved, remained at the centre of the debate. International climate cooperation under the UN climate regime has three dimensions that transcend a legal assessment, but shaped its rules. Indeed, the rules of the regime evolved in interaction with the dimensions of time, imagination, and the complexity of the problems that it seeks to solve. This dissertation reviews this interaction and outcomes of this process that pertain to the legality of the UN climate regime and its substance.

2.3. Methods and theories

Assessing the interplay between legal and non-legal issues related to international climate cooperation was essential to this research project. To elaborate its arguments and develop its reasoning, this dissertation adopts an interdisciplinary approach. The next subsection explains the

[39] Brown and Spiegel, 2019, 154.
[40] Think of the agents of the fossil economy: pitmen, drillers, oil company CEOs, lobbyists for natural gas pipelines, regulators, and car freaks.
[41] Chapter seven describes the interactional space that the Paris Agreement offers to the states parties in order to imagine a global energy and climate future, guided by parameters such as the precautionary approach, climate justice and resilience, and energy justice and security. These parameters guide the discourses that can evolve within this space and require a balancing out beyond market models.
[42] Brown and Spiegel, 2019, 157.

methods that were used and which choices were made in the course of structuring this project, while the last subsection gives an overview of the theories that help to present its research outcomes.

2.3.1. Choices and methods

This research project aimed to understand the evolution of the UN climate regime in its socio-economic context and related to domestic legislative developments. By focusing on the UN climate regime, the design of the project did not disregard the existence of other institutionalised efforts to combat climate change. It also acknowledges that international cooperation under the UN climate regime is hardly enough to address the issue. Yet, the choice was made to explicitly study the evolution of UN climate regime as a multilateral environmental agreement, emphasising that this regime particularly affects decision-making at the intersection of environmental, social, and economic policies.

When examining the evolution of the UN climate regime, the project explored the link between international climate cooperation and the regulation of the energy transition at the national level. Accordingly, the study of two levels of climate governance and their interaction was necessary – i.e. *domestic legislation and policies* and the *UN climate regime*. This research project set out to investigate the UN climate regime related to power sector legislation in the EU U.S., and China.

The reasons for considering the UN climate regime and domestic legislation are threefold. First, *the domestic legislator is indispensable* in passing laws and regulations that are able to provide investors with sufficient certainty to embark on the low-carbon transition. Chapter five highlights this issue with respect to the electricity sector. Furthermore, the domestic legislator also passes laws that implement the climate change measures envisioned in decisions under the UN climate regime. These laws specifically target the generation and use of energy, primarily the restructuring of the electricity sector. Broader climate legislation also includes the conservation of energy and, in some states, the creation of emission trading schemes. National or sub-national lawmakers adopt climate and energy laws that entail concrete measures to reduce greenhouse gas emissions. After 2005, legislators in many states have increasingly streamlined both fields of lawmaking.

Second, the UN climate regime stands out as the only nearly *universal international legal regime* that addresses climate change mitigation. For an attempt to manage international cooperation that deals with a global problem related to the survival of humankind, it is vital to ensure the participation of as many states as possible. Derived from the practice of differential treatment under other MEAs, the UN climate regime sought to assist developing states in

contributing to the regime's objective. The large annual conferences of the parties (COPs) under the UN climate regime with thousands of participants and wide media coverage about outcomes of the negotiations underline this regime's centrality to the institutionalisation of climate change mitigation at the global level.

Third, since this regime evolved under the auspices of the United Nations it carries *great weight in the international community*, especially with states that prioritise the United Nations in international affairs and treasure both the concept of state sovereignty and the position of the state as decisive actor at the international level. Furthermore, the United Nations is uniquely able to incorporate broader concerns of distributive justice. These issues played an important role throughout the history of the regime. Chapters four and seven discuss this aspect of the UN climate regime in detail.

In addition, the choice of sources of domestic legislation needs to explained, both with respect to the jurisdictions that were chosen and the focus on electricity sector regulation. The choice for the EU, U.S., and China almost suggested itself. By analysing legislation from these three jurisdictions, the research project included the largest emitters of greenhouse gases (*see* figure 1.3 in the previous chapter) and the most salient parties to the UN climate regime throughout the regime's history. The choice for the EU as legislator is justified, mainly because the EU aims to create a common market for electricity in the EU. Therefore, the EU has adopted several consecutive packages of energy legislation, including the regulation of the electricity market, starting in the late 1990s. Moreover, climate legislation and policy at the EU level set the parameters for measures that the member states have to implement. The author's training as an international and EU lawyer and sinologist facilitated a thorough study and analysis of all three jurisdictions. Adding further states parties to the UN climate regime would have decreased the depth of the analysis.

The choice for the electricity sector relates to the stage of the low-carbon energy transition. Obviously, the entire energy system will have to be decarbonised. Yet, measures to initiate this process were first implemented in the electricity sector, facilitating the use of renewable energy sources such as wind and solar power. The integration of renewable, non-carbon fuels into the electric grid necessitates far-reaching regulatory measures. Moreover, the share of electricity in global energy consumption will grow in the future, mainly because electricity will replace other fuels related to the trend towards e-mobility. The decarbonisation of electricity generation is a vital first step towards the decarbonisation of the entire energy system.

Since it relied on the study of legislation and academic publications, this project was conducted as a desk research. The material that was analysed included the treaties and decisions of the UN climate regime and secondary literature on the regime written by international legal scholars. In addition, publications by legal scholars on the history and main principles of international environmental law were studied, with special attention to the development of differential treatment in international environmental law.[43]

The research project thoroughly examined electricity sector regulation and the institutional development of the sector in general and specifically in the EU, U.S., and China. By doing so, legislative trends in the decarbonisation of electricity generation were identified and related to domestic economic and institutional characteristics of the three polities. This examination was based on publications by the International Energy Agency (IEA), the energy-policy research body of the OECD, and academic articles in the field of social science energy research.

The reliance on IEA publications is justified, as both the EU and its member states as well as the United States are members of this organisation. Moreover, Chinese government-backed energy think tanks had already been cooperating with the IEA for more than a decade when China officially activated its "association" status[44] with the IEA in 2015.

The IEA regularly publishes reports on global energy developments and country reports. Reviewing these publications over a longer period of time clearly helps to identify long-term trends and interrelationships between climate and energy policies and regulation. These publications warrant a certain degree of consistency with respect to methods and approaches to analysing electricity sector regulation and socio-economic factors that shape policies towards this component of the energy system. Therefore, IEA publications were primarily used to obtain information about developments in the three electricity sectors.

To complement the findings provided by IEA reports, this study relied on secondary academic literature as well as publications by the U.S. Energy Information Administration,[45] an agency of the U.S. Federal Statistical System that provides independent energy statistics and analysis. Finally, the study of China's electricity sector also included Chinese-language policy documents by Chinese government bodies as well as articles in academic journals. Given the lack of academic freedom in the People's Republic of China, some caution is advised when using Chinese academic publications.

[43] *See*, references in the following chapters.
[44] *See*, Joint Ministerial Declaration on the Occasion of the 2015 IEA Ministerial Meeting Expressing the Activation of Association, 18 November 2015, https://www.iea.org/media/news/2015/press/IEA_Association.pdf.
[45] The parent agency of the U.S. Energy Information Administration is the U.S. Department of Energy (DOE). *See* for more information about the agency, U.S. Energy Information Administration, https://www.eia.gov/.

Where this dissertation includes findings that Chinese articles present, they were critically assessed and judged to the best of the author's knowledge, relying on more than two decades of experience in studying the country's political economy.

Finally, this research project did not design the assessment of electricity sector regulation in the EU, U.S., and China as case studies to find empirical evidence for validating a hypothesis. The purpose of covering developments in these three electricity sectors is to show how during the initial stage of the energy transition domestic legislative and socio-economic developments interacted with the UN climate regime. The next subsection explains the theoretical framework that helps to present the research outcomes in this dissertation.

2.3.2. Theoretical framework and methodology

The evolution of the UN climate regime, the CBDR principle's re-definition, and important developments in the electricity sector regulation can hardly be studied from a single theoretical perspective. This dissertation relies on three theoretical approaches to present and contextualise the project's findings – i.e. the interactional theory of international law, norm constructivism in international relations (IR), and constructivist international political economy (IPE). As will be shown below, these three approaches are mutually compatible, mainly because they are all based on a constructivist approach to the study of international relations.

From the late 20th century onwards, the study of the international system in IR has increasingly been influenced by constructivism or social constructivism. The end of the Cold War triggered the emergence of constructivism in this subfield of political science, mainly because this sudden shift in world politics posed a considerable analytical problem for existing IR theories. It challenged rationalist theorising. Constructivism could fill this gap, as it is primarily concerned with the non-material world and studies the formation of ideas and identities. It examines how social interaction produces social identities, which play an important role in constructivist approaches, both related to individuals and states. Interaction among actors forms the basis for the construction of shared or collective understandings (or shared beliefs, ideas). Thus, social phenomena create identities and guide actions. History, societal values, social practices, and institutions condition the identity of actors. Actors' identities then influence which ideas they share. Norms and institutions eventually

arise from an intersubjective consensus of shared understandings about preferable political practices, acceptable social behaviour, and common values.[46]

In their account, Brunnée and Toope use constructivist IR theory, especially the vehicle of "shared understandings," to present a new perspective on the role and functioning of international law. By relying on Lon L. Fuller's theory, they understand law as a purposeful endeavour that is shaped by human interaction and, subsequently, seeks to guide this continuing interaction. Thus, actors arrive at shared understandings and maintain norms in order to "uphold [the] legality" of normative structures that they rely upon.[47] Yet, Brunnée and Toope stress that actors have to work hard and engage in the "distinctive practices" that law demands in order to retain a norm's legality.[48]

With their interactional account of international law, Brunnée and Toope challenge the conception that law is adhered to only when it constitutes a constraint that comes with a sanction.[49] They show how law is able to influence the horizontal international system of state actors.[50] Indeed, their interactional theory of law is based on the premise that shared understandings are the foundation of legal norms. To count as interactional law, these norms must meet the eight criteria of legality and have to be practiced. Only norms that fulfil these criteria are considered as legitimate and can carry a sense of legal obligation.[51] Brunnée and Toope derive these criteria from Fuller's work and apply them to international law.[52]

The criteria of legality distinguish social norms from legal norms.[53] They concern the following characteristics of international legal norms: generality, promulgation, clarity, non-contradiction, non-impossibility, non-retroactivity, constancy and predictability, and congruence between practice and requirement.[54] In chapter seven, this dissertation applies the eight criteria of legality, as proposed by Brunnée and Toope, to mitigation provisions and the operationalisation of the re-defined CBDR principle in the Paris Agreement and the Katowice Rulebook. A brief summary of the criteria suffices for the purposes of this methods section.[55]

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[46] *See*, Sterling-Folker, Jennifer, "Constructivist Approaches," in *Making Sense of International Relations Theory*, ed. Jennifer Sterling-Folker (Boulder, CO: Lynne Rienner, 2013), 127–8; Klotz, Audie, and Cecilia Lynch, *Strategies for Research in Constructivist International Relations*. London: Routledge, 2007, 7; Encyclopaedia Britannica, "Constructivism: International Relations," https://www.britannica.com/topic/constructivism-international-relations.
[47] Brunnée and Toope, 2010, 7.
[48] Brunnée, Jutta, and Stephen J. Toope, "History, Mystery, and Mastery," *International Theory* 3, no. 2 (2011): 354.
[49] Brunnée and Toope, 2010, 2.
[50] Brunnée and Toope, 2001, 187.
[51] Brunnée and Toope, 2010, 129–30.
[52] Ibid., 15.
[53] Brunnée and Toope, 2011, 350.
[54] Brunnée and Toope, 2010, 117–84.
[55] A more extensive discussion is included in chapter four that uses the criteria to assess the legality of mitigation commitments under the Kyoto Protocol; and chapter seven relies on these criteria to examine the mitigation rules of the Paris Agreement and Katowice Rulebook as well as the operationalisation of the CBDR principle under the Paris Agreement.

Generality as the first criterion points to the scope of participation in the adoption process and application of legal norms. Universal participation enhances the legality of an international regime and its norms. The second criterion is *promulgation*. A treaty or instruments must be adopted in a legally binding form to ensure its legality. Third, the norms have to fulfil the criterion of *clarity*. Actors need to understand the procedural and substantive content of the norms that they commit to. The fourth criterion that determines the legality of a regime demands that its norms are *not contradictory*. The fifth criterion continues this line of thinking and requires that the *fulfilment* of the norms must be *possible*. The sixth criterion stresses that norms must *not* be *applied retroactively*. Seventh, a norm needs to entail a sufficient degree of constancy to ensure the *predictability* of its application. The eighth criterion holds that *congruence between practice and required behaviour* is necessary to maintain the legality of the norm in question. Thus, it matters how actors live up to a norm's obligation in practice.[56] Norms that meet these criteria are legitimate and create an obligation that states fulfil whether a sanction is attached to non-compliance or not. Hence, rules in international treaties that meet these criteria and are rooted in shared understandings, which arise through social interaction, are able to "promote adherence."[57]

Brunnée and Toope apply their theory to the mitigation commitments under the Kyoto Protocol and to the CBDR principle as it was operationalised under the UNFCCC and Kyoto Protocol.[58] This dissertation uses the interactional theory to examine the regulation of mitigation action and the re-defined CBDR principle under the Paris Agreement and Katowice Rulebook. Since the CBDR principle serves the internal coherence and functioning of the UN climate regime, it is of utmost importance that this principle is derived from a shared understanding among states parties and that its *interpretation* within the regime continues to reflect a shared understanding.

Interactional facets of law, as defined by Brunnée and Toope, can be discovered where rules in a regime open up spaces where states parties can continue to engage and further develop the legal and substantive quality of the regime's norms. Thus, such rules provide the basis for future interaction.[59] In chapter seven, this dissertation considers the CBDR principle's role in the enhancing the UN climate regime's legality after describing the cycle of norm contestation that the principle underwent after 2005. The dissertation will show that the legality of the UN climate regime hinges on the operationalisation of the CBDR principle. The principle's redefinition in the Paris Agreement

[56] Brunnée and Toope, 2010, 2.
[57] Ibid., 15.
[58] Ibid., 177–90.
[59] Ibid., 356.

eventually resulted in more room for interaction among states parties to further elaborate substantive aspects of their cooperation under the restructured UN climate regime.

Before this dissertation analyses the role of the redefined CBDR principle, as described in the preceding paragraph, it investigates the principle's evolution as a cycle of normative change that followed an instance of norm contestation (*see* figure 2.2). This model has its origins in the field of norm constructivism or norm research, which is a subfield of international relations and examines the lifecycle of international norms. It emphasises that norms are not static and the system of norms is constantly evolving.[60] Norms can be imagined as processes.[61]

Actors interpret these norms, as soon as they feel the need to translate general obligations contained in norms into concrete action. Their interpretation derives from a subjective understanding of what a norm's intersubjective context demands. Different actors will come up with diverging interpretations as to what kind of action is appropriate.[62] Since norms in international society are often not sufficiently explicit or concrete, it is likely that international actors understand their meaning differently in the context of specific situations. This results in debates and conflicts among actors, even if the norm in question is not contested and actors try to comply with it. Hence, contestation is an inherent feature of normative structures.[63]

Normative structures "cannot stand still," because "inescapable tension between general norms and specific actions ceaselessly casts up disputes," which lead to arguments that subsequently reshape the norms and the conduct of the actors, which operate within the normative framework in question.[64] Shared understandings are continuously reconsidered and respond to new developments and interpretations. As a result, norms are renegotiated, reconstructed, and eventually redefined. Wayne Sandholtz visualises the elements of this process as a cycle of normative change.[65] In chapter seven, this dissertation presents the CBDR principle's evolution and re-definition based on Sandholtz's model.

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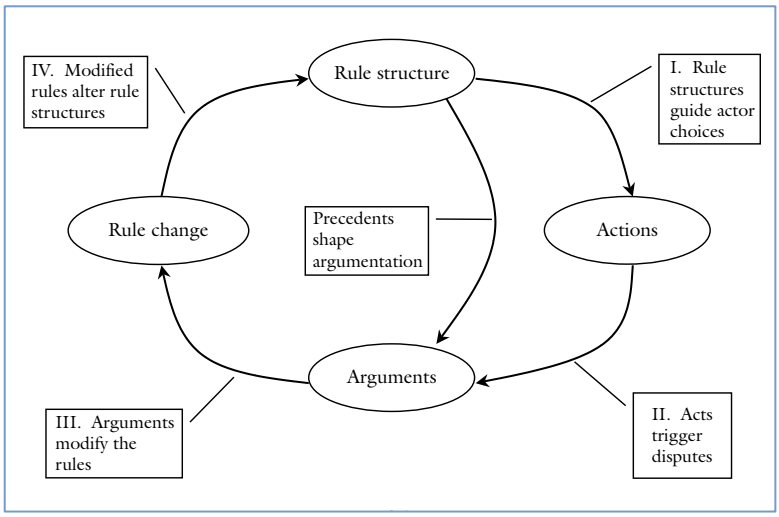
[60] Sandholtz, Wayne, "Dynamics of International Norm Change: Rules against Wartime Plunder," *European Journal of International Relations* 14, no. 1 (2008): 104.
[61] Kook, Mona Lena, and Jacqui True, "Rethinking the Life Cycles of International Norms: The United Nations and the Global Promotion of Gender Equality," *European Journal of International Relations* 18, no. 1 (2012): 103–27.
[62] Hoffmann, Matthew J., "Norm Constructivism: Contesting International Legal Norms," in *Making Sense of International Relations Theory*, ed. Jennifer Sterling-Folker (Boulder, CO: Lynne Rienner, 2013), 150.
[63] Ibid.
[64] Bailey, Jennifer, "Arrested Development: The Fight to End Commercial Whaling as a Case of Failed Norm Change," *European Journal of International Relations* 14, no. 2 (2008): 290.
[65] Sandholtz, 2008, 104.

Figure 2.2: Cycle of normative change



***Source*: Sandholtz, 2008, p. 104.**

The model depicts the cycle of normative change. This change unfolds in four main stages. A given treaty or provision forms the *rule structure* that shapes actors' choices (I). Certain *actions* by parties can lead to disputes among the parties to a specific regime (II). *Disputes* about the proper application of a rule or the necessity to adjust its interpretation then result in *arguments*. These arguments are driven by the criticisms of the parties concerning specific actions and disagreement about the norm's interpretation. The argumentation does not happen in a vacuum, but is influenced by *precedents* – i.e. rule application in the same regime or in other regimes under comparable circumstances. By including precedents, negotiators or parties that contest a norm can shape expectations and increase the persuasiveness of their reasoning. Over time, the presentation of arguments *modifies rules* (III). At that moment, the adjusted rule has become a shared understanding, which eventually leads to rule change. The modified rules then *transform the rule structure* (IV). The changed rule structure subsequently (re-)defines actors' choices and actions, which might ultimately lead to a new round of normative change. It is useful to imagine normative change as circles. Yet, the circles eventually form a spiral, because after a round of normative change the rule structure ends up at a different level, either at a higher or lower stage in its normative evolution. [66] Hence, norms are processes that unfold and respond to changing shared understandings as well as the way in which actors interpret the norms that facilitate their interaction.

[66] Sandholtz, 2008, 103–10.

The third theoretical approach that this dissertation deploys concerns the analysis of economic developments. It follows the theoretical approach of constructivist international political economy, which, as the field of norm constructivism, centres on shared understandings and actors' identities.

International political economy (IPE) generally studies the interactions among states and markets across countries. IPE investigates the connections between economics and politics beyond the confines of a single state, by integrating market studies and political analysis.[67] However, in essence IPE is a subfield of international relations (IR) and follows this field's theoretical traditions.[68] Constructivists that ponder on the world economy consider their subject of study as a *political system* and seek to explain its functioning from a non-materialist perspective. Thus, constructivist IPE scholars want to know how "social facts" (shared understandings or economic ideas) shape the political economy.[69]

When studying stability and change in the world economy, constructivist IPE scholars emphasise that material facets of cross-border economic activity offer few explanations.[70] Instead, they stress that practices and rules of international markets derive from social construction. By doing so, they show that economic exchanges are not driven by rational actors but primarily socially constructed. This does not mean that material aspects are irrelevant. Yet, they are not central to actors' decisions; they contribute to the decision making process together with other considerations. Accordingly, outcomes of economic developments are not inevitable. Hence, constructivist IPE scholars present alternative explanations to the notion that the market and its allocation of resources is a materially given.[71]

For the study of international economic developments, constructivism offers a language that is not available to rationalist approaches.[72] This language is capable of including identities, norms, and shared ideas into the study of economic developments. Interaction shapes identities and shared understandings and creates social facts. Constructivist IPE scholars identify several "bases" that affect interactions and influence economic developments.[73] Among these bases for explaining economic developments, the notion of uncertainty is particularly relevant for the purpose of this research project.

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[67] Cohen, Benjamin J., *International Political Economy: An Intellectual History*. Princeton, NJ: Princeton University Press, 2008, 1.
[68] Abdelal, Rawi, "Constructivism as an Approach to International Political Economy," in *Routledge Handbook of International Political Economy (IPE): IPE as a Global Conversation*, ed. Mark Blyth (Abingdon: Routledge, 2009), 62.
[69] Ibid., 63.
[70] Ibid.
[71] Ibid., 64–5.
[72] Ibid., 71.
[73] Rawi Abdelal identifies meaning, cognition, uncertainty, and subjectivity as bases for construction. *See* in more detail, Abdelal, 2009, 72–5.

Confronted with situations of deep uncertainty,[74] when actors can hardly predict the probabilities of outcomes of choices that are available to them, economic ideas can provide solutions. As shared understandings, economic ideas help people to understand instances of uncertainty and suggest means to regain stability. They thus can form the ideational foundation for the creation of norms and institutions.[75] This dissertation appreciates uncertainty as a catalyst for social construction and the emergence of norms that result from shared understandings. Many choices that actors make based on shared understanding are not necessarily rational – and not predetermined – but relate to actors' perceptions of uncertainty. Thus, norms that evolve in times of uncertainty attest to actors' beliefs of how to deal with it.

This is the backdrop against which this dissertation considers ideas about the structure of the international economic system. Neoliberal thought influenced the establishment of norms during the period that this dissertation covers. During the 1990s, this persuasion of economic theorising guided rulemaking in many economic sectors, as a socially constructed response to uncertainty.[76]

This dissertation specifically assesses the liberalisation of the electricity sector from this perspective. In fact, neoliberal thinking also inspired the conceptualisation of some forms of mitigation action under the Kyoto Protocol. Thus, to adopt constructivist reasoning, neither the choice for an environmental law approach to agree on a global treaty to solve the problem of climate change was inevitable nor the Kyoto Protocol's reliance on flexibility mechanisms. These normative structures resulted from the shared understanding of global warming as an emissions-based atmospheric phenomenon and of market mechanisms as socially constructed responses to uncertainty that actors perceived.

Accordingly, this dissertation embraces the notion that the norms and institutions derive from shared understandings. It considers the rules that guide economic activity, including energy and climate measures, as socially constructed. They are neither predetermined by material facts nor inevitable. The UN climate regime, as the predominant international legal response to the threat of climate change, is based on shared understandings that have been evolving since the regime's establishment. Thus, investigating the regime's evolution from this perspective allows the inclusion of factors that have altered the initial fundamental understandings.

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[74] *See* for the role of economic ideas in situations of uncertainty, Blyth, Mark, *Great Transformations: The Rise and Decline of Embedded Liberalism*. Cambridge: Cambridge University Press, 2002.
[75] Abdelal, 2009, 74.
[76] Mark Blyth specifically examines the correlation between the notion of uncertainty and the emergence of neoliberal economic thinking as the basis of globalised economic exchange. *See*, Blyth, 2002, 252–4.

The dimensions of time, imagination, and complexity are useful to track long-term developments that affect shared understandings, mainly because these ideas and beliefs evolve in response to the reality that agents of social construction face. Shared understanding are prone to change and, over time, rules that are based on these beliefs will reflect this change, especially when new circumstances offer other solutions to a situation of uncertainty.

The feeling of uncertainty formed an inspiring point of departure for the study of the UN climate regime. Chapter three shows how the adoption of the Kyoto Protocol, greatly influenced by neoliberal thinking, was the basis for constructing the identities of the EU, U.S., and China vis-à-vis the UN climate regime. Chapter five relies on the constructivist approaches to developments in the global economy in order to discuss the outcome of the liberalisation of the electricity sectors in the EU, U.S., and China and the introduction of low-carbon policies in the electricity sectors. It particularly uses constructivist thinking to show how decarbonisation became an add-on to the economic idea of liberalising the electricity sector. In this conceptualisation decarbonisation entered the UN climate regime, bridging the gap between national and international lawmaking, albeit as a concept that has its origins in the fossil economy and carries connotations of market-based solutions and rationally behaving actors.

Chapter six then shows how the approach of the UN climate regime was reversed and market approaches became less relevant at the international level. Finally, chapter seven relies on the analytical tools of norm constructivism to trace the evolution of the CBDR principle during the period of 2005 and 2015, while subsequently the interactional theory of international law is deployed to assess the legality of the UN climate regime after the adoption of the Paris Agreement.

Constructivist thinking formed a rich source of inspiration for this dissertation and informed its legal reasoning. The following chapters illustrate how the combination of legal analysis and constructivist theoretical approaches can shine a light on the development of the UN climate regime and reflect on rulemaking in an uncertain, climate-constrained world. This dissertation thus offers a novel framework of methods and theories that can help to comprehend the UN climate regime's legal and substantive evolution.

OUTLINE – CHAPTER THREE

The United Nations climate regime: Rescuing and developing the world in one go

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CHAPTER THREE

The United Nations climate regime:

Rescuing and developing the world in one go

3.1. Introductory remarks

The UN climate regime has been evolving in the wake of a continuing global conversation about practicable responses to global warming. The regime's main legal documents are its treaties – the 1992 UNFCCC,[1] the 1997 Kyoto Protocol (hereafter through chapter seven KP),[2] and the 2015 Paris Agreement.[3] These treaties not only mark different phases in the evolution of the UN climate regime but also reflect the dominant dynamics of the global conversation during these phases. They reveal how the shared understandings about the climate change mitigation developed. Increasing knowledge about both global warming and the scope of the mitigation task guided this process. In addition, from the outset the regime has been shaped by attempts to ensure a fair burden sharing among the members of the international community with respect to mitigation and adaptation efforts. The integration of provisions that reflect these concerns also evolved during the course of the UN climate regime's evolution.[4]

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[1] *See* for an in-depth assessment, Bodansky, Daniel, "The United Nations Framework Convention on Climate Change: A Commentary," *Yale Journal of International Law* 18 (1993): 451–558.

[2] *See* for an overview of the negotiation history and an assessment of the provisions of the KP, Grubb, Michael, Christiaan Vrolijk, and Duncan Brack, *The Kyoto Protocol: A Guide and Assessment*. London: Royal Institute of International Affairs/Earthscan, 1999; Depledge, Joanna, "Tracing the Origins of the Kyoto Protocol: An Article-by-article Textual History," Technical Paper, prepared under contract to UNFCCC, 25 November 2000, http://unfccc.int/resource/docs/tp/tp0200.pdf, pp. 1–135.

[3] *See* for an analysis of the Paris Agreement's approach and main provisions, Klein, Daniel, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham, eds. *The Paris Agreement on Climate Change: Analysis and Commentary*. Oxford: Oxford University Press, 2017.

[4] Differentiation under the UN climate regime, as a tool to acknowledge the position of developing states, is the topic of chapters four and seven.

This chapter provides an overview of the first two treaties that established the UN climate regime – i.e. the UNFCCC and KP. The treaties' contents and structure reveal the difficulties to devise international legal norms that are able to address global warming in a meaningful way. The chapter considers the UN climate change regime's conception in the context of three ideas that were essential for its evolution – i.e. sustainable development, economic liberalisation, and global distributive justice.[5] The chapter shows that these ideas form the basis of the international legal approach to deal with the threat of climate change. Economic liberalisation and distributive justice particularly influenced the provisions of the KP. Chapters four and six of this dissertation will further dive into these specific facets of the UN climate regime and examine the consequences of the choices that were made during the mid-1990s.

Indeed, these choices were also driven by the dynamics among the parties to the UNFCCC and in particular the positions of the main actors. This chapter explores how the EU, U.S., and China, as three main emitters of greenhouse gases,[6] participated in the global conversation and cultivated their identities vis-à-vis the emerging regime. Chapter five will discuss in more detail how the establishment of the UN climate regime created a new social fact – a normative structure – in relation to which each of the three parties subsequently defined its domestic policies. In fact, efforts in this regard were reflected in domestic energy and climate policies and legislation in many states after the adoption of the KP.

To explore interactions between the international and domestic levels, this chapter starts by briefly examining the positions of the three parties in response to the establishment of the UN climate regime. After the adoption of the KP, their attitudes towards the regime were vital for the commencement of international climate cooperation. Thus, at various stages of the UN climate regime's evolution, the three parties to the regime played crucial roles. Without considering their positioning, it is difficult to understand the directions that the regime took whenever it was at a crossroads.

Above all, the contributions by the EU, U.S., and China to limit and reduce greenhouse gas emissions are of utmost importance to UN climate regime's overall success. These parties not only played a vital role in the development of the regime, its development also triggered a response, such as the adoption of domestic climate policies, adjustment of energy legislation, and enactment of far-reaching climate measures. This chapter provides an overview of the early phase of the UN climate

[5] *Cf*. Bodansky et al, 2017, 4–9.

[6] From the outset, the EU (counting its emissions of the 28 member states retroactively, including the United Kingdom that until early 2020 was a member state of the EU), U.S., and China were the largest emitters. *See* figure 1.3 in chapter one for the development of the greenhouse gas emissions of these three emitters (1990–2015).

regime that forms the point of departure for the following chapters. Chapter four discusses the formulation of the CBDR principle and how its operationalisation resulted in a period of contestation that saw China and the U.S. as main opponents. Chapter five summarises the domestic energy and climate measures that were adopted and (partly) enacted in the three jurisdictions, which subsequently became part of the nationally determined contributions under the Paris Agreement and were communicated to the international level. Thus, the following chapters consider specific aspects of the UN climate regime's evolution in more detail in order to collect arguments that help answer the research question in chapters six and seven.

The main provisions of the UNFCCC and KP as well as the Berlin Mandate[7] are the focus of this chapter. The Berlin Mandate, the first decision under the UNFCCC, was of great significance for the further development of the regime, mainly because it cemented the UN climate regime's approach to differentiation for two decades. As will be shown in the following chapters, this decision by the parties greatly influenced the UN climate regime's legal and substantive development. Nevertheless, the first two treaties laid a basis that enabled the states parties to institutionalise and manage international climate action. This chapter argues that the first two treaties of the UN climate regime were vital steps in the formulation of a global response to climate change and a first attempt to conceptualise international climate cooperation. Eventually, the procedural rules of the UN climate regime enabled the states parties to incorporate new insights and address some significant flaws that marred cooperation under the KP.

The next section summarises the main provisions of the UNFCCC and KP. It briefly introduces to the ideas that influenced the regime's approach to climate cooperation. Section three discusses the first attempts of the parties to the UN climate regime to conceptualise the task of mitigating climate change and how this process was influenced by the three above-mentioned ideas. The section then explores the positioning of the three pivotal parties to the regime – EU, U.S., and China – and their response to the establishment of the UN climate regime. The last section concludes.

3.2. UN Framework Convention on Climate Change and Kyoto Protocol

During the second half of the 20th century, the international community became increasingly cognizant of the dangers of global warming. Since the 1960s, natural scientists and environmentalists had been publishing and debating research findings and observations that showed an undeniable

[7] The Berlin Mandate: Review of the Adequacy of Article 4, paragraph 2 (a) and (b), of the Convention, including Proposals Related to a Protocol and Decisions on Follow-up, Decision 1/CP.1 (FCCC/CP/1995/7/Add.1), 6 June 1995.

trend towards higher average temperatures, which were caused by human activity. Several international forums[8] addressed the issue of climate change during the 1980s and early 1990s. The international community gradually realised the need for action. In 1988, the United Nations General Assembly recognised climate change as "a common concern of mankind"[9] and urged for "timely action" to deal with this threat "within a global framework."[10]

In 1989, the signatories of The Hague Declaration on the Environment[11] proposed to develop a "new institutional authority" that would be responsible for combating global warming and establish accompanying decision-making procedures.[12] In December 1989, the UN General Assembly supported the United Nations Environment Programme (UNEP) in its request to "begin preparations for negotiations on a framework convention on climate."[13] Their efforts should lead to "a framework convention on climate and associated protocols containing concrete commitments" that take into account "the specific development needs of developing countries."[14]

These initial steps reveal both the growing concerns about the global scope of the problem and the necessity of universal participation in a cooperation effort to respond to the threat of global warming. Given the nature of global warming as an emissions-based problem, the UN climate regime was established under international environmental law. The UNFCCC constitutes a multilateral environmental agreement (MEA).[15] It sought to ensure universal participation and address climate change globally.[16] Thus, from the outset the concerns of developing states played a vital role. Their situation greatly influenced the formulation of the provisions of both the UNFCCC and KP. This section highlights the main steps in the regime's evolution. It also considers three ideas that influenced its establishment and the conceptualisation of the task that the UN climate regime sought to solve. Chapter four builds on this chapter's findings and assesses the participation of developing states in the UN climate regime and, in particular, the issue of differential treatment under the UN climate regime.

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[8] Major steps in the pre-negotiation phase were the 1985 Villach Conference in Austria, the 1988 Toronto Conference in Canada, the 1989 Hague Summit and the 1989 Noordwijk Conference in the Netherlands, and the Second World Climate Conference that took place in Geneva, Switzerland, in 1990. The United Nations General Assembly also began to give attention to the issue of climate change between 1988 and 1990. *See* for a brief overview, Bodansky, Daniel, "The History of the Global Climate Change Regime," in *International Relations and Global Climate Change*, ed. Urs Luterbacher and Detlef F. Sprinz (Cambridge, MA: MIT, 2001), 24–31.
[9] UN GA Res. 43/53, 6 December 1988 (Protection of global climate for present and future generations of mankind), para 1.
[10] Ibid., para 2.
[11] The Hague Declaration on the Environment, 11 March 1989, 28 ILM 1308 (1989).
[12] Ibid., 1309.
[13] UN GA Res. 44/207, 22 December 1989 (Protection of global climate for present and future generations of mankind), para 10.
[14] Ibid., para 12.
[15] *See* on the nature and institutional features of MEAs, Hey, Ellen, *Advanced Introduction to International Environmental Law*. Cheltenham: Edward Elgar, 2016, 87–8, 96–107.
[16] Bodansky et al point to the fact that general international law is not suited to address complex global environmental problems. It is of great importance that sufficient numbers of key actors agree to be bound by the treaty and are willing to further develop the regime. *See*, Bodansky et al, 2017, 36.

3.2.1. Regime evolution

The UN climate regime's development can be divided into three phases – i.e. the regime's negotiation, establishment, and maturing.[17] First, the UN General Assembly created the Intergovernmental Negotiating Committee (INC) in 1990 in order to *negotiate* a framework convention.[18] This process lasted until the first half of 1992. The United Nations adopted the UNFCCC in May 1992. The UNFCCC was open for signature during the Earth Summit in Rio de Janeiro, Brazil, in June 1992. It entered into force in 1994. Subsequently, the parties to the UNFCCC negotiated the KP and adopted it in 1997. This was the commencement of the regime's second phase – i.e. the regime's *establishment* phase. When the KP eventually entered into force in 2005, the regime's *maturing* phase began. This phase is still ongoing. It is marked by the strengthening of regime's substantive content, as chapters six and seven will show.

From 2005 onwards, developed states parties started enacting policies and laws that aimed to reduce emissions in accordance with their commitments under the KP. The KP specifies emissions reduction obligations for developed states.[19] These obligations had to be fulfilled during the period from 2008 to 2012,[20] which constituted the first commitment period. Developed states also began to engage in climate cooperation with developing states under the provisions of the KP.[21]

At the beginning of the regime's maturing phase, climate action was already underway and, based on their initial experiences, the states parties started negotiating an adjustment of the regime.[22] Initially, they tried to agree on more ambitious post-2012 measures under the KP.[23] During the following years, however, the states parties embarked on the process of negotiating a legal instrument to replace the KP after 2020.[24] The adoption of the 2015 Paris Agreement finished this

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[17] Bodansky et al propose another approach considering the UN climate regime's legal and regulatory development: 1985–90 agenda setting, 1990–95 first constitutional phase, 1995–2005 regulatory phase, and 2005–16 second constitutional phase. Joyeeta Gupta divides the process of climate negotiations into five phases based on substantive and leadership dynamics: pre-1990 framing the problem, 1991–6 leadership articulation, 1997–2001 conditional leadership, 2002–7 leadership competition, and post-2008 leadership during recession. *See*, Bodansky et al, 2017, 96; Gupta, 2014, 38.

[18] UN GA Res. 45/212, 21 December 1990 (Protection of global climate for present and future generations of mankind), para 1.

[19] Article 3 KP.

[20] Ibid.

[21] Cooperation between developed and developing states was organised under the clean development mechanism pursuant to Article 12 KP.

[22] *See* for a brief overview of this period of the UN climate regime, Mayer, 2018, 42–5.

[23] *See*, the decision taken by the first meeting of the parties to the KP in Montreal, Canada, 2005, Consideration of Commitments for Subsequent Periods for Parties Included in Annex I to the Convention under Article 3, Paragraph 9, of the Kyoto Protocol, Decision 1/CMP.1 (FCCC/KP/CMP/2005/8/Add.1), 9–10 December 2005, para 1.

[24] The 2007 Bali Action Plan launched "a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision at its fifteenth session", *see* Bali Action Plan, Decision 1/CP.13 (FCCC/CP/2007/6/Add.1), 14–15 December 2007, para 1. Subsequently, COP-17 at Durban established an Ad Hoc Working Group on the Durban Platform for Enhanced Action and launched "a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties." This process had to be finalised at the 21st session of the conference of parties in 2015. Its outcome would then come into effect and be implemented from 2020 onwards. *See*, Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action, Decision 1/CP.17 (FCCC/CP/2011/9/Add.1), 11 December 2011, para 2, 4.

process and *continues* the regime's maturing phase. This periodization of the UN climate regime's development takes into account the open-ended nature of the Paris Agreement that is emphasised by the Agreement's effort to facilitate a steady progression of international climate action, which chapters six and seven elaborate further.

The UN climate regime follows the framework agreement-protocol approach.[25] The drafters of the UNFCCC drew inspiration from the Ozone regime. Indeed, the Convention for the Protection of the Ozone Layer[26] and the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer[27] were considered particularly viable models for the UN climate regime.[28] Given the expectation that further protocols would provide more substantive detail, the UNFCCC primarily includes procedural provisions and principles that guide the institutionalisation of the regime.[29]

The UNFCCC's substantive provisions are limited and do not prescribe legally binding emissions reduction targets. Article 2 UNFCCC formulates the objective of the regime – i.e. stabilising "greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." Article 3 UNFCCC sums up the Convention's guiding principles. Article 4 UNFCCC lists the general commitments of the parties. Articles 7 to 10 UNFCCC concern the institutions of the convention; and Articles 15 to 18 UNFCCC specify the applicable decision-making procedures with respect to the further development of the regime. Thus, the UNFCCC leaves room for the elaboration of specific and more precise commitments in subsequent protocols. Pursuant to Article 17 (1) UNFCCC the parties "may, at any ordinary session, adopt protocol to the Convention."

Generally, the framework agreement-protocol approach provides a high degree of flexibility to the parties and allows the regime to both adapt to a transforming context of the environmental problem in question and embrace growing scientific certainty about causes and effects of the

[25] *See* for more detail, Bodansky, Daniel, "The United Nations Framework Convention on Climate Change: A Commentary," *Yale Journal of International Law* 18, no. 2 (1993): 493–6.
[26] Vienna Convention for the Protection of the Ozone Layer, 22 March 1985, 1513 UNTS 293, [1988] ATS 26, 26 ILM 1529 (1987).
[27] Montreal Protocol on Substances that Deplete the Ozone Layer, 16 September 1987, 1522 UNTS 3, 26 ILM 1550 (1987), [1989] ATS 18.
[28] As early as autumn 1989, Working Group III under the International Panel on Climate Change (IPCC) voiced its support for a framework convention on climate change that should be based on the format of the Vienna Convention for the Protection of the Ozone Layer and its protocols. *See* for a detailed account of the events prior to the establishment of the negotiation process, Zaelke, Durwood, and James Cameron, "Global Warming and Climate Change: An Overview of the International Legal Process," *The American University Journal of International Law and Policy* 5, no. 2 (1990): 249–90. However, the complexity of the climate change issue and the difficulties to address this issue with available international legal tools became apparent during the negotiations. Winfried Lang participated in the negotiations about both the ozone regime and the UNFCCC. He sums up several significant differences of the climate change negotiations as compared to the ozone regime: The economic stakes were higher with respect to the climate change. The scientific uncertainty about climate change was much higher when the UNFCCC was finalised. The public was less mobilised. The politicised debates between developed and developing states particularly polarised the negotiations. There was a lack of strong leadership, as industrialised states disagreed on several issues. The presence of developing states and their interests was felt much more intensely. *See*, Lang, Winfried, "Auf der Suche nach einem wirksamen Klima-Regime" [The quest for an effective climate change regime], *Archiv des Völkerrechts* 31, no. 1–2 (1993): 18–9.
[29] *See*, Brunnée, Jutta, "Reweaving the Fabric of International Law?: Patterns of Consent in Environmental Framework Agreements," in *Developments of International Law in Treaty Making*, ed. Rüdiger Wolfrum and Volker Röben (Berlin: Springer, 2005), 105.

environmental problem.[30] Yet, by pursuing this approach the parties also need to accept the responsibility to persist in refining the obligations and mechanisms under the regime in accordance with changing circumstances. The negotiations after the KP's entry into force showed that, in the case of the UN climate regime, this proved to be an arduous process.

The framework-protocol structure also allows parties to deal with difficult issues incrementally. Indeed, some salient issues have shaped the negotiations for decades. Divisions among states on certain matters already became apparent during the regime's pre-negotiation phase between 1988 and 1990.[31] These divisions concern disagreements among industrialised states, between industrialised states and developing states, and those among developing states about the conceptualisation and extent of emissions reduction obligations.[32] These tensions particularly affected the initial cooperation under the regime and the negotiation of more ambitious climate action from 2005 onwards. They also revealed the strong link between climate change mitigation and economic development.

Some vital trends that would influence future interactions between the parties emerged during the early negotiation phase. They concern the fact that, starting with the drafting of the UNFCCC, *governments* played a leading role in the negotiation process. By 1990, climate change had become an intergovernmental issue.[33] During the pre-negotiation stage, the climate change debate featured natural scientists and non-governmental organisations that made significant contributions to the process of organising support for a global response. Moreover, the participating governments clearly preferred *consensus* decision-making. This essentially gave each party veto power. Finally, during the negotiations the debates among government representatives were often more concerned with semantic details than substantive issues, mainly because they are used to substitute *political*

[30] Ibid.; Boockmann, Bernhard, and Paul W. Thurner, "Flexibility Provisions in Multilateral Environmental Treaties," ZEW Discussion Paper, no. 02-44, 2002, ftp://ftp.zew.de/pub/zew-docs/dp/dp0244.pdf, pp. 1–36; Bodansky, Daniel, and Elliot Diringer. "The Evolution of Multilateral Regimes: Implications for Climate Change." December 2010, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1773828, pp. 3, 7.
[31] Bodansky, Daniel, and Lavanya Rajamani, "The Evolution and Governance of the Climate Change Regime," paper, 15 January 2015, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2168859, p. 4.
[32] Disagreements among industrialised states emerged at the conference in Noordwijk in 1989. The division concerned the inclusion of quantitative limitations on national emission levels. During the Second World Climate Conference in autumn 1990, cleavages became apparent between industrial and developing states as well as among developing states. The differences between developed and developing states related to the nexus between environmental and developmental policies, while the refusal of quantitative limitations on national emissions by most developing states confronted these states with the Alliance of Small States (AOSIS). *See*, Bodansky and Rajamani, 2015, pp. 6–8.
[33] Grubb et al note that by the late 1980s climate change had become a political issue and governments acted and responded accordingly. *See*, Grubb et al, 1999, 27.

confrontations for linguistic subtleties.[34] These trends continued throughout the second and into the current third phase of the UN climate regime's evolution.

The combination of government-centred debates, the preference for consensus decision-making, and considerable political differences among main actors had a profound impact on the drafting process of the UNFCCC. They also greatly influenced the negotiation of the KP, and numerous consecutive decisions that sought to further develop the regime, which chapters four, six, and seven discuss in more detail.

3.2.2. Three guiding ideas

The debates about a global response to the threat of climate change reflected the intricacy of policies that would need to be pursued in order to solve this problem. From the outset, three ideas have been shaping the UN climate regime – i.e. liberalisation in the economic realm, sustainable development, and global distributive justice. They emphasise the global socio-economic and environmental challenges that humankind faces when designing policy and regulatory measures to deal with climate change.

Although the three concepts derive from intellectual movements that emerged during the second half of the 20th century, they are not interrelated; and they definitely do not converge. Indeed, this non-convergence results in an inherent tension within the UN climate regime. This is an important characteristic of the UN climate regime. Given the content of the ideas, which are difficult to balance at best, the regime's evolution is by no means predetermined. Therefore, the construction of climate action under the UN climate regime does not follow one inevitable path. Instead, the evolution of the UN climate regime, depending on the nature of shared understandings among the parties at decision-making moments, can proceed in previously unexpected directions. Chapters six and seven show how a complete reversal of the Kyoto approach was accomplished with the adoption of the Paris Agreement. Rather than convincingly presenting a better approach to climate cooperation, states parties' choices are based on the zeitgeist and prevalent perceptions that the parties shared at crucial moments in the regime's evolution.

During the 1990s, the narrative of free markets and rational actors captured the zeitgeist. Neoliberal economic theory became mainstream economic thinking and influenced economic reforms in all parts of the world. This theoretical approach began to inform national economic

[34] *See* on intergovernmental trends and the politicisation of the matter, Bodansky, Daniel, "The History of the Global Climate Change Regime," in *International Relations and Global Climate Change*, ed. Urs Luterbacher and Detlef F. Sprinz (Cambridge, MA: MIT, 2001), 28; *see* on the linguistic "cover up" of political disagreements and issue of consensus, Bodansky and Rajamani, 2015, p. 8.

policymaking during the 1980s. U.S. President Ronald Reagan and UK Prime Minister Margaret Thatcher were the leading proponents of neoliberal reforms. At the international level, neoliberal thinkers sought to respond to the ideas of the New International Economic Order[35] that developing states promoted at the UN level during the mid-1970s.[36] The principles of neoliberalism particularly affected the negotiation of the KP.

However, neoliberal preferences for transnational economic activity in free markets and a limited role of government in economic affairs contrasted sharply with increasing public interest in the consequences of unfettered economic growth for the environment. Fast economic development in industrialised economies had caused severe environmental degradation during the 1950s and 1960s. In many developed states, societal movements emerged that sought to address this crisis. The United Nations Conference on the Human Environment that took place in 1972 was a first response to growing concerns about global environmental issues.[37] This broad intellectual and societal movement continued to thrive. From the 1980s onwards, sustainability has been its primary concept to engage in a broad socio-environmental debate.[38]

The idea of sustainable development is concerned with a transformed relationship between human society and the environment in the long term.[39] The 1987 Brundtland Report[40] combined this notion with global developmental aspects. It describes the concept of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[41] It contains two components – i.e. to give "overriding priority" to "the essential needs of the world's poor" and the realisation that "the state of technology and social organization" impose limitations "on the environment's ability to meet present and future needs."[42] This concept had a far-reaching impact on the further evolution of international environmental law. Its core elements are inter-generational equity, intra-generational equity, the need to protect the environment, as well as the demand to integrate economic, social, and environmental policies.[43]

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[35] *See* for an account of the intellectual counter-movement to undo the legacy of the New International Economic Order in international law, Slobodian, Quinn, *The Globalists: The End of Empire and the Birth of Neoliberalism*. Cambridge, MA: Harvard University Press, 2018, 245–62.
[36] *See* for an in-depth discussion of the debate about a New International Economic Order at the UN level, including its main documents and outcomes, as well as its relevance to the establishment of the UN climate regime, subsection 4.2.2. of the next chapter.
[37] *See* for a summary of the first steps to institutionalise international environmental protection, section 4.2. of the next chapter.
[38] *See*, Brown, Lester R., "Building a Sustainable Society," *Society* 19, no. 2 (1982): 75–85.
[39] Arias-Maldonado, Manuel, "Rethinking Sustainability in the Anthropocene," *Environmental Politics* 22, no. 3 (2013): 436.
[40] UN Doc. A/42/427, (Report of the World Commission on Environment and Development), Annex (Report of the World Commission on Environment and Development – "Our Common Future"), 4 August 1987.
[41] Ibid., p. 54.
[42] Ibid.
[43] In order to conceptualise sustainable development, Lucas Seghezzo outlines a framework that facilitates the discussion of personal, temporal, physical, geographical, and culturally aspects of development, while Justice Mensah considers the economic, social, and

Given its broad approach, the concept of sustainable development is a salient feature of international agreements that respond to so-called second-generation environmental problems. These problems are less readily identifiable forms of "pollution" and involve deep-rooted social practices. Generally, complex approaches are required to deal with this kind of environmental issues. Accordingly, MEAs are concerned with an international response to transnational or even global environmental problems and usually seek to address interrelated developmental issues.[44]

The concept of sustainable development played an important role during the Earth Summit (United Nations Conference on Environment and Development) that was held in Rio de Janeiro, Brazil, in June 1992.[45] At that time, the concept of sustainable development was omnipresent. It was mentioned in all major documents[46] that were adopted ahead of or in the context of the 1992 Earth Summit, including the UNFCCC.

Debates about global developmental challenges frequently cite the concept of distributive justice. This concept relates to questions of equity in the international realm. Deliberations about equity are generally driven by the existence of a huge wealth gap. This inequality has consequences for international cooperation, both in a practical and ethical sense. Thus, the concept of distributive justice points to the relations between developed or industrialised states (mainly the members of the OECD) and developing states and how wealth is distributed globally. The above-mentioned debate about a New International Economic Order in the UN General Assembly during the mid-1970s formed a peak moment for voicing demands for a more equal distribution of wealth at the global level.

Eventually, the concerns that were raised during this debate entered international lawmaking in a more subtle form. International legal documents that relate to socio-economic problems – such as environmental matters – usually include provisions that express concern for the needs of developing states. Thus, MEAs enshrine the concept of distributive justice in their negotiating contexts and the enactment of the treaties by providing differential or preferential treatment.

Differential treatment in international environmental law tries to address vulnerabilities and weaknesses of developing states that relate to the implementation of the MEA in question, in order

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environmental dimensions of sustainable development. *See*, Seghezzo, Lucas, "The Five Dimensions of Sustainability," *Environmental Politics* 18, no. 4 (2009): 539–56; Mensah, Justice, "Sustainable Development: Meaning, History, Principles, Pillars, and Implications for Human Action: Literature Review," *Cogent Social Sciences* 5, no. 1 (2019): 1–21.

[44] Magraw, Daniel Barstow, and Lisa D. Hawke, "Sustainable Development," in *The Oxford Handbook of International Environmental Law*, ed. Daniel Bodansky, Jutta Brunnée, and Ellen Hey (Oxford: Oxford University Press, 2007), 628–37.

[45] See on streamlining the negotiations, Adede, Andronico O., "The Treaty System from Stockholm (1972) to Rio de Janeiro (1992)," *Pace Environmental Law Review* 13, no.1 (1995): 33–48.

[46] Rio Declaration on Environment and Development, 14 June 1992, UN Doc. A/CONF.151/26 (vol. I), 31 ILM 874 (1992), principle 8; Articles 2, 3 (4) UNFCCC; Convention on Biological Diversity, 29 December 1993, [1993] ATS 32, 1760 UNTS 79, 31 ILM 818 (1992), Article 8 (e); and throughout the Agenda 21, https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf.

to enable these states to participate in efforts to solve global environmental problems. The UN climate regime is a prominent example for this trend. In this regime, differential treatment based on the concept of distributive justice plays a crucial role. The UN climate regime incorporates concerns of distributive justice by operationalising the principle of common but differentiated responsibilities, both in the context of procedural and substantive provisions, as chapter four discusses in detail.[47]

To sum up, three vital concepts shaped the negotiation and establishment phases of the UN climate regime. They concern the structuring of economic activity, the balance between development and environmental protection, and a response to global inequality. The concepts reflect the prevalence of market forces in the course of solving the environmental problem at hand, while adhering to the notion of sustainable development and responding to the call for global distributive justice and equity. The influence of these concepts on the UN climate regime varied during its evolution, depending on the direction in which the shared understandings of the parties developed. The next section summarises how, under these circumstances, the UN climate regime initially conceptualised the task of combating global warming.

3.3. The establishment of the UN climate regime

Following the negotiation phase that concluded with the adoption of the UNFCCC, the regime's substantive provisions needed to be strengthened, in order to initiate international efforts to mitigate climate change. The definition of the regime's objective and the design of the parties' obligations were vital tasks. During the establishment phase of the UN climate regime, the states parties conceptualised globally coordinated climate action for the first time. They discussed these issues in the context of the objective of the UNFCCC. Subsection 3.3.1. explores the construction of the regime's approach to international climate cooperation. It also provides an overview of how the provisions that regulate these vital components of the UN climate regime were influenced by the three above-described ideas. Then, subsection 3.3.2. summarises how the resulting conceptualisation of climate cooperation influenced the positioning of the EU, U.S., and China vis-à-vis the UN climate regime.

[47] The origins of the CBDR principle and its operationalisation in the UN climate regime are the topic of chapter four.

3.3.1. Conceptualising international climate action

Climate change is a global environmental problem that necessitates joint efforts of the broadest possible coalition of states. Since the commencement of the initial climate negotiations the imperative of universality[48] has guided the evolution of the regime. To obtain the support of developing states, the drafters of the UNFCCC were mindful of developmental issues. As already mentioned, the concept of sustainable development also featured during the negotiations of all documents of the 1992 Earth Summit. It is also included in the Kyoto Protocol that was adopted in 1997.[49] Finally, market approaches played a particularly important role in the drafting of the Kyoto Protocol.[50]

Article 3 UNFCCC reflects all three above-mentioned ideas. This article lists the principles of the regime and demands that measures to achieve the Convention's objective should be guided by these principles. Paragraphs 1 and 2 of Article 3 UNFCCC address equity and distributive justice concerns by demanding that the states parties protect the climate system for present and future generations "on the basis of equity and in accordance with their differentiated responsibilities and respective capabilities"[51] and by urging that "full consideration" should be given to the "specific needs and special circumstances" of developing states, "especially those that are particularly vulnerable to the adverse effects of climate change" and those that would disproportionately be burdened under the UNFCCC.[52]

Article 3 (4) UNFCCC declares that the parties "have a right to, and should, promote sustainable development," while measures that are taken to mitigate climate change "should be integrated with national development programmes." Paragraph 3 of the same article is remarkable in the sense that, in its first sentence, it demands that the parties "should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects," but in the next sentence it expects measures to be "cost-effective so as to ensure global benefits at the lowest possible cost."[53]

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[48] From the outset, international efforts to address climate change acknowledged the fact that "climate change affects humanity as a whole" and that the international community should respond "within a global framework." See, UN GA Res. 43/53, 6 December 1988 (Protection of global climate for present and future generations of mankind), para 1.

[49] *See* Articles 2 (1), 10, 12 (2) KP.

[50] The negotiations conveyed a preference for cost-effective instruments to reduce emissions. This conceptualisation was reflected in the so-called flexibility mechanisms. Subsection 6.2.2. of chapter six discusses the effects of this approach. *See* for a summary of the flexibility mechanisms, Mayer, 2018, 134–7; Soltau, Friedrich, *Fairness in International Climate Change Law and Policy*. Cambridge: Cambridge University Press, 2009, 70–92.

[51] Article 3 (1) UNFCCC.

[52] Article 3 (2) UNFCCC.

[53] Article 3 (3) UNFCCC.

Article 3 (5) UNFCCC also gives prominence to the economic context of mitigating climate change by demanding that the states parties "should cooperate to promote a supportive and open international economic system," which would lead to "sustainable growth and development" in all states. This paragraph also cautions that mitigation measures, "including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade."[54]

Article 4 UNFCCC sums up the obligations that the parties have under the Convention. Paragraph 1 lists the commitments that all parties must fulfil. Paragraph 2 only addresses parties included in Annex I (developed states and states with economies in transition). These parties are required to "adopt national policies and take corresponding measures on the mitigation of climate change."[55] Since no specific targets for the reduction of greenhouse gas emissions were included in the UNFCCC, this task remained vague. The negotiation of the Kyoto Protocol had to fill this gap.

The KP refers to the principles of Article 3 UNFCCC in its fourth preambular paragraph. Its fifth preambular paragraph, however, was even more consequential for the conceptualisation of international climate action under the UN climate regime, mainly because it mentions the Berlin Mandate. This document was the first decisions that the parties adopted under the UNFCCC. It concerned the initiation of a process that would result in "appropriate action for the period beyond 2000, including the strengthening of the commitments of the Parties included in Annex I to the Convention […] through the adoption of a protocol or another legal instrument."[56] Paragraph 2 (b) of the Berlin Mandate includes this document's most important provision. It emphasises that the process to negotiate a protocol or legal instrument would not introduce "any new commitments" for non-Annex I parties (developing states); it would only reaffirm existing commitments included in Article 4 (1) UNFCCC. Hence, developing states would not be obliged to reduce their emissions as part of international climate action that the negotiations envisioned for the period after the year 2000.

By doing so, the nature of climate cooperation was characterised by a rigid differentiation between developed and developing states.[57] The Berlin Mandate also mentions the concept of sustainable development.[58] However, next to the operationalisation of differentiation, the emphasis of market approaches is the most prominent feature that distinguishes the design of the KP.

[54] Article 3 (5) UNFCCC.
[55] Article 4 (2) (a) UNFCCC.
[56] Second preambular paragraph of Decision 1/CP.1.
[57] Chapter four discusses differential treatment under the KP in detail.
[58] Decision 1/CP.1, para 1 (c), 2 (a), (b).

During the negotiation of the KP, the U.S. proposed market-based solutions that would be flexible and cost-effective. In addition, the U.S. demanded verifiable and binding mid-term emissions targets that could be met by flexible implementation measures and international trading. Without presenting much more substance than this, the EU accepted this initial con-ceptualisation. The negotiation continued on this path, while most participants were uncertain about the broader implications of the U.S. proposal.[59]

Nevertheless, the U.S. was only willing to accept binding emissions reduction targets if market-based approaches were available to Annex I parties to achieve their reduction targets. This should enable the states parties to make reductions where it is most cost-effective.[60] These measures were included in the KP. Articles 6 and 12 KP establish the so-called flexibility mechanisms that allow developed states to support projects abroad and obtain credits that can be used to achieve their own emissions reduction targets.[61]

The functioning of these mechanisms aside, it was primarily the ideational impact of these mechanisms that determined their relevance for the development of the UN climate regime. The inclusion of these mechanisms into the KP resulted in a prolonged debate about their institutionalisation and the rules and procedures that were needed to enact these mechanisms. This debate dominated the conversation about climate action. Proponents of neoliberal market theories promoted the narrative that market mechanisms would be sufficient to address the climate change problem.[62]

In addition, a basket of greenhouse gases was identified that would count as valid emissions reductions, although the main task was the reduction of CO_2 emissions.[63] Indeed, at the time of the adoption of the KP, most parties were unsure which measures would have to be implemented in order to achieve the binding emission targets that Annex B of the KP sets for developed states. Arguably, the market mechanisms were the most tangible instruments that the KP established. Thus, the KP reflected a very reduced version of the major undertaking that the parties would have to

[59] *See* for an in-depth recount of the negotiation process, Mintzer, Irving M., and J. Amber Leonard, eds., *Negotiating Climate Change: The Inside Story of the Rio Convention*. Cambridge: Cambridge University Press, 1994; Grubb et al, 1999.
[60] Bodansky et al, 2017, 179.
[61] Section 6.2. discusses their functioning and contribution to climate change mitigation.
[62] The 2007 Stern Review, for instance, deemed the costs of mitigating climate change "manageable" and emphasised emissions trading as "a powerful way to promote cost-effective reductions in emissions and to bring forward action in developing countries: strong targets in rich countries could drive flows amounting to tens of billions of dollars each year to support the transition to low-carbon development paths." *See*, Stern, Nicholas, *The Economics of Climate Change: The Stern Review*. Cambridge: Cambridge University Press, 2007, iiv, ix.
[63] Some parties supported a counting method that preferred the most cost-effective emissions reduction path, instead of targeting the most important greenhouse gas. *See*, Grubb et al, 1999, 71–2.

engage in, in order to combat global warming.[64] Hence, at this stage of its evolution the UN climate regime did not convey a vision of the large-scale global transformation that was required to combat global warming.

3.3.2. Identity formation during difficult conversations

The regime that was established during the 1990s was characterised by a rigid differentiation of the commitments that the parties had to fulfil, based on their inclusion in Annex I of the UNFCCC. Moreover, the previous section showed that the parties to the UN climate regime faced much uncertainty as to the right measures that would allow them to achieve the objective of the UNFCCC – i.e. stabilising the concentration of greenhouse gases in the atmosphere at safe levels.[65] Indeed, the conceptualisation of climate action and a better understanding of its necessary scope would only emerge after 2000. The establishment phase of the UN climate regime was thus marked by doubts and ambivalence at the global level.

Individual states and societies perceived and addressed the threat of climate change very differently at the national level. The conceptualisation of climate change depended on the awareness and understanding of the kind of ongoing global environmental degradation, visible effects of climate change, the dependence of the domestic economy on fossil fuel exports, as well as a broad range of socio-economic issues that would easily divert attention to much more urgent policy matters.

This dissertation focuses on the role and position of the EU, U.S., and China in the UN climate regime. The positioning of these three parties during the establishment phase of this regime was vital for its further development. At this point, a brief summary of the perceptions that shaped the three parties' approaches suffices.[66] It describes the political and socio-economic situation of the three parties in relation to global warming and the mitigation of climate change.

During the second half of the 1980s, the issue of climate change was widely debated in developed states. Throughout the 1990s, the public in the U.S. and in the member states of the EU was aware of the threat and debated the necessity of a policy response. In China, however, the official line was that pollution was a capitalist problem. If people were concerned with environmental issues, these forms of environmental degradation were largely the result of outdated industrial

[64] Chapters five and six discuss how substantive adjustments evolved from domestic climate and energy legislation and shifting trends in the energy sector and subsequently informed substantive provisions of the UN climate regime.
[65] Article 2 UNFCCC.
[66] *See* for more detail on the evolution of the climate debates and the initiation of mitigation policies in the EU, U.S., and China, Carlarne, Cinnamon Piñon. *Climate Change Law: EU and US Approaches*. Oxford: Oxford University Press, 2010; Gallagher, Kelly Sims, and Xuan Xiaowei, *Titans of the Climate: Explaining Policy Process in the United States and China*. Cambridge, MA: MIT Press, 2018; Pettenger, Mary E., ed., *The Social Construction of Climate Change: Power, Knowledge, Norms, Discourses*. London: Routledge, 2007.

installations[67] and an utterly wasteful use of resources, especially soil and water. Air pollution issues were most visible in large cities and industrial areas where heating and power generation relied on coal.[68] There was little awareness of and concern for global environmental issues among the public.[69] Arguably, during the 1990s there were more urgent problems,[70] as the country and the Chinese people were recovering from three decades of devastating socialist policies.[71]

The positioning of the three parties vis-à-vis the UN climate regime included societal perceptions of the climate change issue, but was also driven by broader economic strategies. This process commenced during the establishment phase of the UN climate regime when specific measures were negotiated. The EU was most supportive of a global regime to mitigate climate change. In fact, emissions in the EU had decreased from the late 1980s onwards. It was expected that this trend – with specific measures – could even be strengthened. However, the attitudes among the member states varied considerably. Internal debates evolved along with international climate negotiations. Eventually, the EU secured an EU "bubble" as a collective reduction target pursuant to Article 4 KP, which internal negotiations subsequently split up in individual assignments for the member states.[72]

During the establishment phase of the UN climate regime, the EU largely failed to translate its pro-active attitude into substantive proposals that would be accepted by other parties to the UN climate regime. Although the EU emerged as a leader in international climate negotiations, it was rather unsuccessful in shaping the design of major decisions and instruments. The KP and 2001 Marrakech Accords are cases in point.[73] Indeed, the EU both supported the rigid approach to

[67] Parts of China were industrialised prior to World War II – in particular the northeast and east of China – and during the 1950s. Economic development stalled during the second half of the 1960s and early 1970s as a result of political campaigns.
[68] *See* for an account of China's environmental problems, Shapiro, Judith, *China's Environmental Challenges – Second Edition*. Cambridge: Polity, 2016.
[69] Only in 1997, the Chinese government began to publish reports on global environmental challenges and its positioning at the international level. *See* for an overview of China's position on international issues from the 1990s onwards, Liu Nengye, "China's Position on International Environmental Issues," in *Research Handbook on Chinese Environmental Law*, ed. Qin Tianbao (Cheltenham: Edward Elgar, 2015), 375–93.
[70] During the period from 1979 – the beginning of economic reform – until 1992, the Chinese GDP increased from U.S.$178 billion to U.S.$423 billion, while the population crossed the one-billion milestone (1982). Political upheaval during the Cultural Revolution (1966–76) had brought the economy on the verge of collapse. Severe political disagreements among the leadership over the direction of economic reform resulted in a cautious and incremental approach to the transformation of the Chinese economy. Initial reform measures in agriculture were successful, while the reform of state-owned enterprises of the industrial sector proved difficult. In 1993, the Central Committee of the Chinese Communist Party decided to establish a socialist market economy. *See*, Wu Jinglian, *Understanding and Interpreting Chinese Economic Reform*. Mason, OH: Thomson, 2005, 57–89; World Bank, "Data: China," https://data.worldbank.org/country/china.
[71] *See* for an overview of China's evolving approach to environmental problems, Finamore, Barbara, *Will China Save the Planet?* Cambridge: Polity, 2018.
[72] *See* subsection 5.3.2.1. for a discussion of the EU's internal carbon emissions policies and legislation.
[73] Van Schaik, Louise, and Simon Schunz, "Explaining EU Activism and Impact in Global Climate Politics: Is the Union a Norm- or Interest-driven Actor?," *Journal of Common Market Studies* 50, no. 1 (2012): 180.

differentiation of the Berlin Mandate that developing states had insisted on as well as the market mechanisms, which the U.S. and other like-minded OECD member states favoured.[74]

The U.S. public was highly aware of the climate debate and many people supported coordinated action to combat the threat of climate change. However, the position of the Clinton administration, which was supportive of a global agreement on emissions reductions, was weakened by internal politicisation of the issue and lobbying by the fossil industry and representatives of federal states that feared the economic consequences of far-reaching emissions reductions. Thus, socio-economic interests constructed the perception of the threat of climate change vis-à-vis more imminent economic losses as a result of a fast enactment of climate measures. Public opinion was increasingly divided. The subject became politicised,[75] followed by Congress's decision that it would not ratify an agreement in which developing states with large and fast growing economies had no obligations to start limiting their emissions at a certain point in time.[76] Thus, the U.S. eventually left the Kyoto process under President George W. Bush. Yet, the proposals that had been submitted by U.S. negotiators – especially those concerning the flexibility mechanisms – have largely shaped international climate cooperation during the first two decades of the 21st century.[77]

When comparing their approaches to international climate cooperation, this course of events was the culmination of a development that reversed the positions that the EU and U.S. had held in relation to international cooperation on environmental affairs. Daniel Kelemen and David Vogel relate this change to the political economy of domestic regulation. During the 1980s, the U.S. was the leading force in the debate on environmental issues and, in particular, in efforts to institutionalise international cooperation to address climate change. However, domestic support for environmental policy declined in the U.S. during the 1990s, while companies based in the U.S. faced no federal regulation to reduce greenhouse gas emissions.[78] Moreover, domestic environmentalist pressures

[74] *See* for a summary of the EU role during the establishment phase of the UN climate regime and the development of Union's internal climate policy, Yamin, Farhana, "The Role of the EU in Climate Negotiations," in *Climate Change and European Leadership: A Sustainable Role for Europe?*, ed. Joyeeta Gupta and Michael Grubb (Dordrecht: Springer, 2000), 47–66, and Wettestad, Jørgen, "The Complicated Development of EU Climate Policy," in *Climate Change and European Leadership: A Sustainable Role for Europe?*, ed. Joyeeta Gupta and Michael Grubb (Dordrecht: Springer, 2000), 25–45.

[75] At that time, those politicians who opposed the KP expected that China's greenhouse gas emissions would overtake those of the U.S. by 2015. They feared a slowdown of economic growth in the U.S. and a loss of jobs of about 1.5 million as well as a dramatic rise in energy prices. Hagel, Chuck, "Kyoto: The Political Realities," *IPA Review* 50, no. 1 (1997): 16.

[76] *See* for a broader discussion of this issue section 4.4. of chapter four.

[77] *See* for a summary of the role of the U.S., Depledge, Joanna, "Against the Grain: The United States and the Global Climate Change Regime," *Global Change, Peace and Security* 17, no. 1 (2005): 11–27.

[78] The U.S. Congress can set binding national reduction targets for emissions. However, it failed to pass any comprehensive climate change legislation in this regard. *See*, Gallagher and Xuan, 2018, 88, 26.

were relatively weak. Thus, having their government opt against rigid international rules on greenhouse gas emissions gave U.S. businesses a big competitive advantage.[79]

During the same period, public awareness in the EU, developments in the member states, and the European Commission's growing regulatory competence strengthened the EU's role in international environmental rulemaking.[80] This enabled the EU to fulfil a leadership role in international negotiations about environmental issues. Kelemen and Vogel conclude that the EU emerged as a strong proponent of international climate cooperation and an important leader in international environmental lawmaking in general, mainly because the EU's domestic regulatory conditions became much more favourable to actively promoting international environmental agreements.[81] Indeed, based on this domestic legal environment the EU could convince other parties that it would be able to implement the agreements in question.

This also influenced the EU's position in international climate negotiations. At that time, however, environmentalist pressures in EU member states and the Union's initial domestic climate policies had already begun to shape the EU's leadership role in climate change affairs.[82] Thus, from the outset the EU considered itself as a leader in international climate negotiations. It was instrumental in ensuring the adoption of the UNFCCC and the KP.[83] EU representatives continued to promote the cause of international climate action and particularly stressed the economic benefits of early action, which also reflected the internal communication of the European Commission. Subsection 5.3.2. will further elaborate on this linkage between the EU's international stance and supranational decision making.

Economic arguments also determined China's position on international climate action. The Chinese leadership considered the climate change issue as an economic problem, in the sense that developed states had a responsibility (and the means) to solve it and, most importantly, any international agreement should not interfere with China's economic development strategy. During the early 1990s, the political situation in China was tense. The members of the Politburo, the highest decision-making institutions within the Chinese party-state, were at loggerheads over the

[79] Kelemen, Daniel R., and David Vogel, "Trading Places: The Role of the United States and the European Union in International Environmental Politics," *Comparative Political Studies* 43, no. 4 (2010): 446–7.
[80] Ibid., 438–47.
[81] Ibid., 437–8.
[82] The EU's initial climate change policy was a failure. It included various climate measures; many of them were controversial among member states. The institutional and economic basis of most measures was questionable. However, Wettestad points to the "symbolic importance" of EU climate policies. *See*, Wettestad, Jørgen, "The Complicated Development of EU Climate Policy: Lessons Learnt," in *Climate Change and European Leadership: A Sustainable Role for Europe?*, ed. Joyeeta Gupta and Michael Grubb (Dordrecht: Springer, 2000), 27–35.
[83] This was the case with respect to both the UNFCCC and KP, despite the fact that the design of the KP and its instruments – especially the flexibility mechanisms and the emissions trading – were not priority items for the EU. *See*, Yamin, Farhana, "The Role of the EU in Climate Negotiations," in *Climate Change and European Leadership: A Sustainable Role for Europe?*, ed. Joyeeta Gupta and Michael Grubb (Dordrecht: Springer, 2000), 49, 54, 65.

continuation of economic reforms. The disagreements could only be resolved in early 1992. Economic growth emerged as the sole means to achieve a stabilisation of the fragile socio-economic and political situation. The Chinese leadership had no room for manoeuvre during the negotiations of the KP.[84] In addition, its international position was imperilled after the imposition of economic sanctions by the U.S. and other developed states following the Tian'anmen massacre in Beijing in 1989.[85] Therefore, the Chinese leadership closely cooperated with the G-77 grouping in the climate negotiations during the 1990s and primarily supported the positions that developing states favoured.[86]

In line with this approach and based on domestic socio-economic difficulties throughout the 1990s, China positioned itself with respect to the UN climate regime as a developing state. The leadership continued to adhere to this positioning during the first decade of the 21st century, and even after China had become the largest emitter of greenhouse gases and its per capita emissions were on par with those the EU.[87] Given the rigid differentiation that the Berlin Mandate had introduced, the positioning of the Chinese leadership greatly influenced the prospect of strengthening climate cooperation under the UN climate regime after the KP's entry into force in 2005. This impasse essentially led to the initiation of further negotiations alongside the commencement of the KP's first commitment period (2008–12) during which developed states began to enact measures aimed to reduce or limit their economies' greenhouse gas emissions. Chapters six and seven explore this negotiation process and its outcomes, primarily focusing on the evolution of the differentiation among states parties and the conceptualisation and regulation of mitigation commitments.

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[84] Zhang Haibin (张海滨), "中国与国际气候变化判断" [China and the international climate change negotiations], 国际政治研究 [International political research], no. 1 (2007): 21–36.

[85] *See* for a retrospect, Wang Dan, "What I Learned Leading the Tiananmen Protests," *New York Times*, 1 June 2019.

[86] *See* for an overview of China's domestic economic constraints that shaped its climate policy and international stance, Heggelund, Gørild, "China's Climate Change Policy: Domestic and International Developments," *Asian Perspective* 31, no. 2 (2007): 155–91; on China's cooperation with the G-77, Kamga, Serges Djoyou, "The G77 and the Transformation of Global Relations: Challenges and Opportunities," in *Inclusive Development in Africa: Transformation of Global Relations*, ed. Vusi Gumede (Pretoria: Africa Institute of South Africa, 2018), 205–27.

[87] In 2011, China's average per capita CO_2 emissions were on par with those of the EU for the first time. In 2014, it overtook the EU in terms of per capita emissions. *See*, PBL Netherlands Environmental Assessment Agency, "Per Capita CO2 Emissions in China Reached European Level," 18 July 2012, https://www.pbl.nl/en/news/2012/per-capita-co2-emissions-in-china-reached-european-level; McGrath, Matt, "China's Per Capita Carbon Emissions Overtake EU's," *BBC*, 21 September 2014, https://www.bbc.com/news/science-environment-29239194.

3.4. Concluding remarks

The international community's first attempt to institutionalise international climate cooperation was the topic of this chapter. The parties to the UNFCCC faced great difficulties when they tried to conceptualise the task of mitigating climate change. Domestic economic concerns hindered many parties to commit to far-reaching mitigation obligations under the KP. Beginning in the late 1980s, the evolution of the UN climate regime proceeded in three phases: The *negotiation* phase lasted until the adoption of the UNFCCC. Subsequently, during the *establishment* phase the parties negotiated the KP and reached agreement about detailed emissions reduction obligations. The *maturing* phase began with the entry into force of the KP in 2005 and further negotiation efforts to strengthen the regime's substantive provisions. This phase is still ongoing.

From the outset, three ideas have shaped the design and content of the UN climate regime. The concept of sustainable development influenced all major documents that were adopted during the 1992 Earth Summit. The negotiation of the KP, however, showed that ideas derived from neoliberal market theories prevailed over considerations about environmental integrity concerns and the precautionary approach. Eventually, the parties sought to frame the reduction of greenhouse gas emissions in terms of cost-effectiveness. This diverted attention away from the core concern of limiting and reducing CO_2 emissions.

The third idea that shaped the UN climate regime is the concept of distributive justice. It entered the regime's provisions in the form of the CBDR principle that seeks to ensure differential treatment for vulnerable and weak developing states, while also facilitating their participation in the regime. At the same time, developed states should take the lead to mitigate climate change. Following the adoption of the Berlin Mandate, however, the negotiators of the KP adhered to a very inflexible approach to differentiation.

This hampered the progress of international climate cooperation, mainly because it closely related to the positioning of the U.S. and China, two major emitters whose contribution to the regime has been of utmost import. The EU was unable to either prevent the strong reliance on market mechanisms or soften the approach to differentiation. Its pro-active approach to climate action mainly worked internally, resulting in early Union-wide climate measures. During the establishment phase of the UN climate regime, however, the EU failed to convince other parties to consider its proposals.

This chapter tentatively relates to the storylines of differentiation and decarbonisation. During the establishment phase, differentiation became highly politicised and subsequently led to a difficult

start of international climate cooperation under the KP after the U.S. had left the Kyoto process. Differentiation under the UN climate regime remained contested.

The decarbonisation storyline is largely invisible during the establishment phase of the UN climate regime, mainly because the states parties were not yet able to conceptualise the task that they would have to accomplish in order to meaningfully address the threat of climate change.

Throughout the negotiation and establishment phases, the dimension of time played an important role. Negotiations took place under severe time constraints. Under these circumstances, most parties were hardly in a position to elaborate strategies and plans for far-reaching climate action. This affected the negotiation of both the UNFCCC and KP. Furthermore, the parties were unable to determine the time scales during which future climate action should take place. As a result, the conceptualisation and institutionalisation of international climate cooperation was vague and weak at the end of the UN climate regime's establishment phase.

The conceptualisation of the task touches upon the dimension of imagination. The states parties imagined the threat of climate change and possible mitigation measures differently. In each state, the initial imagination and specific socio-economic circumstances contributed to the perception of the climate change problem among the public. The outcomes of this process varied considerably across the globe. This effect is also reflected in the positioning of the three large emitters – EU, U.S., and China – public debates, economic concerns, and political considerations shaped their approach to international negotiations about the issue. The input of these three parties, based on domestic perceptions and interests, greatly influenced the regime's development.

This leads to the dimension of complexity. After the adoption of the UNFCCC and the call to strengthen its substantive approach, most governments examined the economic and social consequences of climate measures. Obviously, there was not yet a viable path to constructive climate action. Therefore, most governments were reluctant to agree to intrusive measures, while the issue of differentiation increasingly sowed discontent among the parties. The international regime that was established was incoherent. Instead of appreciating the complexity of the task, the parties tried to both rescue and develop the world on the cheap.

In sum, two main findings stand out and are essential for developing the storylines of differentiation and decarbonisation in the following chapters. First, the concepts that relate to neoliberal market approaches, sustainable development, and global distributive justice greatly influenced the establishment of the UN climate regime. Yet, they also introduced an inherent tension into the regime. Second, the states parties were very uncertain about the scope of the task and the

amount of resources that the mitigation of climate change would involve. With the KP, they adopted a treaty to engage in climate cooperation whose approach to differentiation was insufficiently adaptable to global economic changes and which was weak from a substantive perspective. The next chapter continues the assessment of the differentiation issue, before chapters five and six will consider the UN climate regime's substantive development – its quest for meaningful climate action.

OUTLINE – CHAPTER FOUR

Common but differentiated responsibilities: Contested quest for development in a changing climate

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CHAPTER FOUR

Common but differentiated responsibilities:

Contested quest for development in a changing climate

4.1. Introductory remarks

The issue of inequality in the global economy shaped the negotiations of the UNFCCC and the UN climate regime's subsequent development. The framework convention was scheduled to be adopted during the 1992 United Nations Conference on Environment and Development (UNCED or Earth Summit) in Rio de Janeiro, Brazil. The past weighed heavily on representatives of more than 170 governments that prepared this part of the Earth Summit.[1] In fact, the negotiations of the UNFCCC were reminiscent of the heated debates at the United Nations about a reform of the post-war international economic system during the 1970s.[2] Once again, the main source of contention was global inequality. As a legacy of this period, arguments and concepts presented and conceived during these debates became a major thread running through the successive negotiations about global efforts to mitigate climate change, especially with respect to the UN climate regime's approach to differential treatment.

In international environmental law, differential treatment is a salient tool in international negotiations to accommodate diverging economic circumstances of states parties to an agreement.

[1] Separate preparatory committees met to agree on the legal instruments that were adopted in the context of the UNCED or Earth Summit. The International Negotiating Committee for a Framework Convention on Climate Change met to negotiate the United Nations Framework Convention on Climate Change. It was established by a resolution of the UN General Assembly. *See*, UN GA Res. 45/212, 21 December 1990 (Protection of global climate for present and future generations of mankind).

[2] A delegate who participated in the preparatory work for the UNFCCC concluded that the Earth Summit had been "the last great U.N. conference of the *1970s*." *See*, Bodansky, Daniel, "The United Nations Framework Convention on Climate Change: A Commentary," *Yale Journal of International Law* 18, no. 2 (1993): 480, at note 183. (italics in the original quote)

As will be shown, this tool has been developing in the context of international environmental law since the early 1970s. The principle of CBDR, as included in Articles 3 UNFCCC and 10 KP, alludes to this tool of international environmental lawmaking, as it seeks to address global economic inequality. The operationalisation of the CBDR principle in the KP resulted in different obligations for developed and developing states in order to accommodate their diverging economic circumstances, based on the situation during the late 1990s.

Differential treatment of states in the context of international legal efforts to combat climate change is not an exceptional phenomenon. In international law, this instrument evolved slowly in the first half of the 20th century and entered various international regimes during the post-war decades.[3] By deviating from the principle of sovereign equality between states, differentiation among states according to their socio-economic situation often helped to deal with imbalances in the international economic system.

During the 1950s and 1960s, the liberation movement of colonised peoples and, subsequently, the formal independence of former colonies created a new, urgent momentum for departing from the equal treatment of states, in particular in dealing with global environmental problems. In fact, at around the same time the global scope of environmental degradation became ever more apparent. More awareness of an unfolding global environmental disaster and the shift in global affairs following the decolonisation movement coincided.

However, newly independent and developing states did not have the means to engage in meaningful environmental protection. Therefore, differential treatment seemed particularly useful in order to ensure a wide or even universal reach of MEAs. Hence, differential treatment became an instrument in international environmental law, linking the common concern of humankind for the environment to developmental matters. Based on the evaluation of the history of differential treatment and other MEAs, this chapter answers the first sub-question that guided this research project:

1. *Which determinants should be considered relevant for assessing the **meaning and role of the CBDR principle** in the UN climate regime?*

[3] *See* examples of differentiation in: Article 405 (3) Treaty of Peace between the Allied and Associated Powers and Germany, signed 28 June 1919, 225 CTS 188; Article 19 (3) Constitution of the International Labour Organization, signed 9 October 1946, 15 UNTS 40; Article XVIII General Agreement on Tariffs and Trade, 30 October 1947, 55 UNTS 194; Articles 61 (3) and 62 United Nations Convention on the Law of the Sea, concluded 10 December 1982, 1833 UNTS 3; *see* also, Hey, Ellen, "Common but Differentiated Responsibilities," *Max Planck Encyclopedia of Public International Law*, 2011, https://opil.ouplaw.com/, para 2.

From the outset, the intrinsic linkage between environmental degradation and development has been most palpable at the UN level. In 1972, the UN Conference on the Human Environment took place in Stockholm. From the early 1970s onwards the response to global environmental degradation in international lawmaking progressed alongside developmental issues. The debate about global deprivation crystallised into a struggle for a reform of the entire post-war international economic system. This struggle reached its peak in 1974 when the UN General Assembly contemplated establishing a new international economic order in an attempt to eliminate global socio-economic inequalities.[4]

The demands that were voiced during this debate profoundly influenced the evolution and conceptualisation of differential treatment in international environmental law. As will be shown, during the following decades differential treatment evolved further and increasingly guided the cooperation of state parties under international environmental regimes.

In the early 1990s, the wording "common but differentiated responsibilities" emerged to express differential treatment. At the 1992 Earth Summit in Rio de Janeiro, this wording premiered as a stipulation of differential treatment in international environmental law. The formulation was included in both the 1992 Rio Declaration[5] and the UNFCCC.[6] Subsequently, the CBDR principle became "a permanent feature of international environmental law-making and diplomacy"[7] and evolved into a principle of good global environmental governance.[8] Undoubtedly, the CBDR principle in the UN climate regime has become the most prominent and most consequential articulation of differential treatment in international environmental law.

Legal scholars who analyse differential treatment generally focus on developmental issues related to international cooperation on environmental affairs. Authors who specifically discuss differential treatment under the UN climate regime primarily focus on three actors or groups of actors that shaped the regime – i.e. the U.S., the EU, and developing states. Some researchers follow the so-called North-South narrative that emphasises the dichotomy between developed and developing states and regulatory aspects of the CBDR principle's distributional role in international

[4] Subsection 4.2.2. discusses the origins and main arguments as well as prominent actors of the debate about a revision of the international economic system.
[5] Rio Declaration on Environment and Development, 14 June 1992, UN Doc. A/CONF.151/26 (vol. I), 31 ILM 874 (1992), Principle 7.
[6] Articles 3 (1), 4 (1) UNFCCC.
[7] Honkonen, Tuula, "The Development of the Principle of Common but Differentiated Responsibilities and its Place in International Environmental Regimes," in *International Environmental Law-making and Diplomacy: Insights and Overviews*, ed. Tuomas Kuokkanen, Ed Couzens, Tuula Honkonen and Melissa Lewis (Abingdon: Routledge, 2016), 181.
[8] Hey, 2012, 365–76.

regimes,[9] while others examine the competition for global leadership on climate change between the U.S. and the EU and their positions on the operationalisation of the CBDR principle.[10] Further topics are the role of coalitions of states in climate change mitigation, their interaction with the UN climate regime, and their different stances on the CBDR principle.[11]

This body of research mainly scrutinises the issue of differential treatment in the UN climate regime in the context of the polarity between developed and developing states. By doing so, it overlooks China's role at several critical junctures in the history of international environmental law. At these crucial moments, China succeeded in dominating the discourse and eventually determined how differential treatment entered the UN climate regime. To grasp the UN climate regime's history, it is vital to evaluate China's contribution to the regime's evolution. Therefore, this chapter assesses how China influenced the consideration of developing states' concerns in international environmental law and, specifically, the CBDR principle's role in the UN climate regime.

In order to examine differentiation among states parties in the UN climate regime, this chapter takes a historical perspective and starts off by recounting the debate among members of the United Nations about inequality in the international economic system that took place during the 1970s. The assessment of the historical context and main documents of this debate helps to understand the political, economic, and institutional background of differential treatment. The analysis of the CBDR principle in UN climate regime in this chapter and, subsequently, in chapter seven shows that, given the interlinkages between developmental and environmental issues, the legacy of this UN debate greatly influenced the design of the UN climate regime as well as its procedural and substantive evolution.

This chapter highlights China's efforts to include the wording of the CBDR principle in the UNFCCC and, particularly, to determine its operationalisation in the KP. The chapter argues that China played a key role in shaping the principle's interpretation in the UN climate regime. In fact, the Chinese leadership managed to control the discourse until the KP's entry into force in 2005. This important milestone in the UN climate regime's history was followed by a round of norm contestation that reassessed the interpretation and operationalisation of the CBDR principle. This chapter outlines the developments until the starting point of the contestation. The findings in this

[9] *See*, Rajamani, Lavanya, *Differential Treatment in International Environmental Law*. Oxford: Oxford University Press, 2006; Honkonen, Tuula, *The Common but Differentiated Responsibility Principle in Multilateral Environmental Agreements: Regulatory and Policy Aspects*. Alphen aan den Rijn: Kluwer, 2009; Kellersmann, Bettina, *Die gemeinsame, aber differenzierte Verantwortlichkeit von Industriestaaten und Entwicklungsländern für den Schutz der globalen Umwelt* [The common but differentiated responsibility of industrial and developing states for the protection of the global environment]. Berlin: Springer, 2000.

[10] *See*, for instance, Brunnée, Jutta, "Europe, the United States, and the Global Climate Regime: All together Now?," *Journal of Land Use* 24, no. 1 (2008): 1–43.

[11] *See*, for instance, Gupta, Joyeeta, *The History of Global Climate Governance*. Cambridge: Cambridge University Press, 2014, 147–72.

chapter form the point of departure for the analysis in chapter seven that will evaluate how the meaning of the CBDR principle evolved during the annual rounds of UN climate negotiations from 2005 to 2015 that resulted in the adoption of the Paris Agreement. Thus, this chapter forms the basis for the discussion in chapter seven of the re-defined CBDR principle that makes a marked contrast to the deficiencies of the principle's operationalisation in the KP.

The next section explains the origins of the CBDR principle. It sketches the debate at the UN General Assembly about global inequality during the 1970s and summarises the development of differential treatment in international environmental law, including an assessment of this tool in several international legal documents that guide international cooperation on environmental affairs. Section three focuses on the operationalisation of the CBDR principle in the UNFCCC and the KP. It also includes a brief overview of the discourse among legal scholars on the principle's operationalisation in the UN climate regime prior to the adoption of the Paris Agreement. The fourth section examines why the CBDR principle emerged as the lynchpin of contestation among states parties, as exemplified by the conflict over the KP, especially after the passage of the Byrd-Hagel Resolution[12] in the U.S. Senate. The final section concludes.

4.2. The origins and nature of the CBDR principle

The emergence of differentiation in international environmental law relates to developing states' demands for an equitable international economic system. This section correlates the quest for more equality in global economic affairs with China's role in shaping the discourse on differentiation and promoting the CBDR principle. It will show that divergent factors influenced the CBDR principle. As a result, the CBDR principle not only communicated a legal meaning based on equity concerns but also a strategic political vision of shielding national economic development from global environmental concerns. This section argues that the principle inadvertently obtained a hybrid role. From an international legal perspective, the principle's function of enabling cooperation on environmental matters and addressing inequalities in the global economy in the context of environmental cooperation is the CBDR principle's most obvious facet. Yet, the principle's role in the UN climate regime also reflects China's involvement in international environmental lawmaking and its concern for the country's own economic development.

[12] S.Res. 98 (1997) – A resolution expressing the sense of the Senate regarding the conditions for the United States becoming a signatory to any international agreement on greenhouse gas emissions under the United Nations Framework Convention on Climate Change, 27 July 1997.

To delve into the CBDR principle's hybrid nature in the UN climate regime, this section first examines Chinese moves to push for more attention for developmental aspects of international efforts to protect and conserve the environment (subsection 4.2.1). Subsequently, this section relates the international political economy of the early 1970s to the UN debate about global socio-economic issues and its institutional outcomes (subsection 4.2.2). China's role in voicing the demands of developing states during the UN debate about a new international economic order is particularly noteworthy. Between 1972 and 1992, China evolved from ideologue to a pragmatic leader of the developing world in international forums. This position was vital for China's efforts to promote the inclusion of the CBDR principle in the UNFCCC.

Finally, this section summarises how the inclusion of differential treatment in international legal documents to manage international environmental cooperation increasingly acknowledged the nexus between development needs and the necessity to address global environmental problems (subsection 4.2.3). It shows how differential treatment became part of international documents on environmental matters and MEAs in order to facilitate the participation of developing states in global environmental governance. The section finishes with an overview of several international environmental regimes to analyse how the CBDR principle conveys ideas about a fairer international order.

4.2.1. China's influence on the 1972 Stockholm Declaration and its legacy

The evolution of UN governance in environmental matters differs from other global challenges that emerged during the 20th century. In this field of international policymaking, China has been part of the debate from the very beginning and contributed to the substance and institutionalisation of vital international norms. In 1972, the international community for the first time addressed global environmental problems at the UN level when the Stockholm UN Conference on the Human Environment took place. This was also the first big UN conference in which representatives of the People's Republic of China participated.[13] It was the first time that Chinese negotiators had the opportunity to promote the cause of the developing world in the context of drafting a major international document. Interestingly, the dynamics that unfolded during the Stockholm Conference

[13] After the rapprochement between the United States and the People's Republic of China in 1971, thirty states recognised the PRC. On 25 October 1971, the UN General Assembly adopted a resolution on "the restoration of the lawful rights of the People's Republic of China" in the United Nations. *See*, Garver, John W., *China's Quest: The History of the Foreign Relations of the People's Republic of China*. Oxford: Oxford University Press, 2016, 304–5; UN GA Res. 2758 (XXVI), 25 October 1971 (Restoration of the lawful rights of the People's Republic of China in the United Nations).

on the Human Environment would eventually dominate the negotiations of the UN climate regime two decades later.

The preparation of the conference in Stockholm and the debate during the conference centred on two issues that became even more interrelated in the decades to come – i.e. the concern for environmental problems on the part of industrialised states and the demands of developing states for an improvement of their difficult socio-economic circumstances. During the conference, China succeeded in reformulating many of the principles of the proposed Stockholm Declaration.[14]

The most important contribution that China's negotiators made, together with the Group of 77,[15] concerned the notion that environmental problems of developing states were a result of underdevelopment.[16] In the 1970s, the Chinese discourse on the link between development and environmental issues generally identified colonial and imperialist exploitation as the root cause of environmental degradation in most developing states. Thus, these states needed to rid themselves of the oppression by "superpower hegemonism"[17] and "develop their national economies, gradually build up a modern industry and modern agriculture and achieve economic independence so as to consolidate their political independence."[18]

Although this line of thought acknowledges that economic development harms the environment, it clearly emphasises that economic and technological progress will enable developing states to solve these problems.[19] China's stance at the Stockholm Conference clearly reflected this thinking.[20] It had its origins in late Maoist ideology,[21] which continued to inform China's domestic policies with respect to the relationship between economic development and environmental

[14] On China's request, a working group on the declaration was established. The text of 21 of the 23 principles was revised. Four new principles were added to the proposed declaration, while one principle was referred to the plenary session (supply of information by states concerning activities that have environmentally adverse effect beyond their territory) and one principle was directly referred to the UN General Assembly. The principle that was referred to the UN GA concerned nuclear weapons. China wanted to include "inhuman biological and chemical weapons." A revised version of this principle was added as Principle 26. *See*, Sohn Louis B., "The Stockholm Declaration on the Human Environment," *Harvard International Law Journal* 14, no. 3 (1973): 430–31.

[15] The Group of 77 is an intergovernmental organisation that represents the "collective economic interests" of developing states in the United Nations. The G-77 was established by 77 developing states in 1964. Today, more than 130 states belong to this group. The group lists China as one of its members. However, China does not consider itself a member of the group. Since the 1970s, China has been cooperating on various issues with the group. *See* on the G-77, "The Group of 77 at the United Nations," http://www.g77.org/doc/; *see* on the relations between China and the G-77, Kamga, 2018, 205–27.

[16] Sohn, 1973, 44; *see*, preamble para 4 and Principle 9 Stockholm Declaration.

[17] According to the Chinese leadership, both the Soviet Union and the United States were responsible for the continued oppression of the developing world.

[18] Chu Ko-ping (Qu Geping), "Environment and Development," *Peking Review* 20, no. 20 (1976): 19.

[19] Ibid.

[20] Paragraph 4 of the preamble of the Stockholm Declaration is mainly based on a Chinese proposal: Yet, the final version of this paragraph omitted reference to independence and sovereignty as well as the notion that developing states should expand their economies and "solve their own environmental problems." Paragraph 4 instead calls on industrialised states to reduce the gap between them and developing states. Compare UN Doc A/CONF.48/WG.I/CRP.23 (1972) and the final paragraph 4 of the preamble of the 1972 Stockholm Declaration, UN Doc. A/Conf.48/14/Rev. 1 (1973), 16 June 1972 (Declaration of the United Nations Conference on the Human Environment), 11 ILM 1416 (1972). *See* in more detail, Sohn, 1973, 443–4.

[21] Mao Zedong (1893–1976) was the paramount leader of Communist China from its foundation in 1949 until his death in 1976.

concerns during the following decades.[22] This thinking also shaped China's proposals in international environmental forums,[23] including the negotiations about the UNFCCC.

Following China's and other developing states' proposals, the link between the objectives of pursuing economic development and addressing environmental problems was high on the political agenda of the Stockholm Conference. During the conference, it became clear that economic development was at the core of international cooperation on environmental affairs. Yet, it was also noticeable that economic development can transform into a "polemical issue" and, together with the insistence on sovereignty as the "loadstar of national existence," it hampers progress with respect to environmental measures.[24]

Nevertheless, the conference's substantive focus remained on nature conservation and the prevention of pollution.[25] The conference report included an Action Plan with 109 recommendations for governments and international organisations that highlighted the areas of concern: restoration, preservation, and prevention.[26] In fact, it was a major achievement that the conference brought together governments in order to discuss environmental protection. Furthermore, the Stockholm Conference started a process of institutionalising international cooperation on environmental issues and international environmental lawmaking.[27] The debates during the conference also indirectly suggested a solution to the diverging views of developed and developing states regarding the urgency of environmental measures compared to the need of fast economic development – i.e. techno-financial aid from developed states.[28]

During ensuing major conferences on global environmental issues, the link between socio-economic deprivation in the developing world and environmental degradation became increasingly pronounced.[29] International documents on environmental affairs that were adopted in the context of the 1992 Earth Summit, such as the 1992 Rio Declaration and the UNFCCC, broadly acknowledge the

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[22] In 2013, Qu Geping, one of the participants of the Chinese delegation at the Stockholm Conference, deplored his country's environmental situation after decades of fast economic development. Qu concluded that China had repeated the mistakes of other industrialised states. Yet, China's problems have become particularly challenging, due to its huge population and the enormous size of its economy. He attributed the magnitude of China's current environmental problems to an insufficient supervision of sub-national governments and the country's political system that lacked the rule of law. *See*, "Ex-minister Blames China's Pollution Mess on Lack of Rule of Law," *South China Morning Post*, 21 January 2013.

[23] *See* in general on China's environmental diplomacy and its priorities at the Stockholm Conference, Cai Shouqiu, and Mark Voigts, "The Development of China's Environmental Diplomacy," *Pacific Rim Law and Policy Journal* 3, no. 1 (1993): 21–22.

[24] Joyner, Christopher C., "Stockholm in Retrospect: Progress in the International Law of Environment," *World Affairs* 136, no. 4 (1974): 349.

[25] Hey, 2016, 15.

[26] Joyner, Christopher C., "Symbolic Reflections of the Environmental Crisis: Some International Implications," *International Interactions* 2, no. 3 (1976): 137; *see*, Action Plan for the Human Environment, UN Doc. A/Conf.48/14/Rev. 1 (1973), 16 June 1972 (Action Plan for the Human Environment), 11 ILM 1416 (1972).

[27] Joyner, 1974, 357; Elliott, Lorraine, *The Global Politics of the Environment*. Basingstoke: Macmillan, 1998, 15.

[28] Joyner, 1976, 137, 136.

[29] Rajamani, Lavanya, "The Changing Fortunes of Differential Treatment in the Evolution of International Environmental Law," *International Affairs* 88, no. 3 (2012): 614.

situation of developing states. This approach was necessary for two reasons. First, the participation of developing states was required to obtain a global reach of the regime in question. Second, the situation of developing states had to be specifically addressed following the emerging principle of CBDR in international environment law. This is, in part, an achievement of Chinese diplomats and negotiators.

Accordingly, China's role in this process cannot be overestimated. It is vital to understand the link between this principle of international environmental law and China's domestic economic priorities when assessing the country's stance in the international climate negotiations. In fact, Chinese commentators describe the evolution of international environmental law, and especially the UN climate regime, as a process in which China and other developing states continuously "defended" the CBDR principle against attempts by developed states to "correct" the principle's meaning or even "eradicate" the principle from the UN climate regime.[30] The principle's core meaning in their reading is the "foremost responsibility" that developed states have with respect to global environmental degradation. Hence, this principle is a "powerful weapon" in the hands of developing states during international negotiations.[31] The next subsection provides an overview of the heated debates that inspired the conceptualisation of the CBDR principle.

4.2.2. Demands of developing states and the United Nations

International law alone cannot overcome global socio-economic cleavages. However, the international debate about global socio-economic problems influenced legal concepts, especially in international environmental law. Developmental issues entered this field of law from the outset. Understanding the interrelationship between the position of developing states in the international economic system and their posture in the UN General Assembly is vital, mainly because the UN climate regime, despite its design as an MEA, particularly impacts the future of energy sector – i.e. the most essential sector of every modern economy.[32] From the perspective of state sovereignty, the calls against international climate cooperation often cater to the fear that interference with a state's

[30] Bo Yan (薄燕), " '共同但有区别的责任' 原则与中国环境外交话语" [The principle of 'common but differentiated responsibilities' and China's environmental diplomatic discourse], 复旦国际关系评论 [Fudan international relations comments] (2013): 207, 215.

[31] Yang Xing (扬兴), "国际环境法的'共同但有区别的责任原则'刍议 " [Commentary on the principle of 'common but differentiated responsibilities' in international environmental law], 安徽大学法律评论 [Anhui university law review] 5, no. 2 (2005): 302.

[32] From the mid-1990s onwards, many analysts understood the fact that the energy sector would play a critical role in the mitigation of climate change. Despite the fact that the framing of the problem in terms of international environmental law was maintained, the need to make far-reaching adjustments to the production of energy and its economic consequences informed the political debate about an international approach to climate change mitigation. Hence, the problem of mitigating climate change was understood as an issue that potentially had tremendous consequences for domestic economic policymaking and economic development in general.

energy production in an attempt to protect the environment would "deprive" the state in question from economic opportunities. Climate measures would essentially interfere with this state's right to development.

During the negotiations about a proposed New International Economic Order (NIEO) in the 1970s, the climax of the development debate, postulations were made that greatly influenced the conceptualisation of differential treatment in MEAs. This conceptualisation paved the way for the formulation of the CBDR principle. In order to understand the legacy of the differentiation discourse, it is important to consider the UN climate negotiations from the perspective of the previous UN debates on international socio-economic issues.

Ideas that would inform the NIEO movement had been maturing since the 1950s. At the beginning of the ensuing decades, attempts were made at UN level to improve the situation in the poorer parts of the world. The UN General Assembly gradually turned into a forum where developing states could voice their concerns about their position in the governance of the international economic system.[33] It facilitated some first steps to foster international cooperation in order to ameliorate the living standards in the poorest states. By doing so, the United Nations honoured its founding vision that put equal emphasis on socio-economic and military security.[34] Indeed, Article 2 (3) of the Charter of the United Nations (UN Charter)[35] calls for a peaceful settlement of disputes "in such a manner that international peace and security, and justice, are not endangered," while Article 55 UN Charter[36] mentions the promotion of socio-economic development as one of the tasks of the United Nations. Hence, after World War II the United Nations, to some degree, became "the bearer of extravagant, even utopian hopes for the development and maintenance of an international order."[37]

During the 1960s and 1970s, the UN development agenda took shape. In 1961, the United Nations General Assembly adopted the resolution *Programme for International Economic Co-operation (I)* and designated the following decennium as the "United Nations Development

[33] As early as 1948, UN General Assembly addressed the situation of developing states in a resolution. Low standards of living were considered to have "bad economic and social effects in countries directly concerned and on the world as a whole." These circumstances could cause "instability" that affects the "peaceful and friendly relations among nations" and the "development of conditions of economic and social progress." The resolution recommended to "give further and urgent consideration to the whole problem of the economic development of under-developed countries in *all* its aspects." (italics in the original) *See*, UN GA Res. 198 (III), 4 December 1948 (Economic development of under-developed countries).

[34] Toye, John, and Richard Toye, *The UN and Global Political Economy: Trade, Finance, and Development*. Bloomington, IN: Indiana University Press, 2004, 1.

[35] *See*, Charter of the United Nations, 26 June 1945, [1945] ATS 1, TS 993.

[36] Article 55 of the Charter of the United Nations relates socio-economic progress, solving international socio-economic problems, and the universal respect for human rights to "the creation of conditions of stability and well-being which are necessary for peaceful and friendly relations among nations based on respect for the principle of equal rights and self-determination of people" that UN "shall promote."

[37] Toye and Toye, 2004, 1.

Decade."[38] This resolution acknowledged the "need for concerted action to demonstrate the determination of Member States to give added impetus to international economic co-operation in the current decade, through the United Nations system and on a bilateral or multilateral basis."[39] Together with Resolution 1715 (XVI),[40] which called on UN member states to provide funding for cooperation with developing states, this resolution aimed to achieve "a minimum annual rate of growth of aggregate national income of 5 per cent at the end of the Decade."[41]

By 1970, at the end of the First United Nations Development Decade, the situation had not improved. The UN General Assembly concluded in Resolution 2626 (XXV) that the living standard of millions of people in developing states was "still pitifully low."[42] Many people in the developing part of the world were "still undernourished, uneducated, unemployed and wanting in many other basic amenities of life."[43] Having made these observations, the UN General Assembly called for a Second United Nations Development Decade.[44] Furthermore, Resolution 2626 (XXV) linked poverty to the problem of global security. It noted a widening disparity between a part of the world that lives "in great comfort and even affluence" and a larger part of the world that suffers from "abject poverty" – a "lamentable situation" that "contributed to the aggravation of world tension."[45]

Yet, in the early 1970s novel facets widened the debate at UN level, resulting from changed politico-economic circumstances and increasing desperation in many developing states. Demands for a new international economic order became more numerous and audible. To some, the time seemed right to broadly address developmental issues at UN level. It was obvious that the Bretton Woods system[46] had failed the needs of these states.[47]

The post-war international economic system derived its name from Bretton Woods, New Hampshire, United States. In July 1944, a conference was held there at which the structure of future

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[38] UN GA Res. 1710 (XVI), 19 December 1961 (United Nations Development Decade: A Programme for International Economic Co-operation (I)), para 1.
[39] Toye and Toye, 2004, 1.
[40] UN GA Res. 1715 (XVI), 19 December 1961 (United Nations Development Decade: A Programme for International Economic Co-operation (II)).
[41] UN GA Res. 1710 (XVI), 19 December 1961, para 1.
[42] UN GA Res. 2626 (XXV), 24 October 1970 (International Development Strategy for the Second United Nations Development Decade), para 3.
[43] Ibid.
[44] Ibid.
[45] Ibid..
[46] *See*, Bordo, Michael D., "The Bretton Woods International Monetary System: A Historical Overview," in *A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform*, ed. Michael D. Bordo and Barry Eichengreen (Chicago, IL: University of Chicago Press, 1993), 3–108, 49–50; Helleiner, Eric, "Reinterpreting Bretton Woods: International Development and the Neglected Origins of Embedded Liberalism," *Development and Change* 37, no. 5 (2006): 956–65; Helleiner, Eric, "The Development Mandate of International Institutions: Where Did It Come from?," *Studies in Comparative International Development* 44, no. 3 (2009): 207–9; Rodrik, Dani, *The Globalization Paradox: Why Global Markets, States, and Democracy Can't Coexist* (Oxford: Oxford University Press, 2011), 69–76.
[47] Ruggie, John Gerard, "International Regimes, Transactions, and Change: Embedded Liberalism in the Postwar Economic Order," *International Organization* 36, no. 2 (1982): 413.

international governance was discussed. This conference adopted respective *Articles of Agreement* and established the International Monetary Fund and the International Bank for Reconstruction and Development (this institution was further transformed into the World Bank). These bodies formed the institutional framework of the Bretton Woods system. They mainly aimed to ensure enough international discipline that would allow steady progress towards trade liberalisation, while giving governments regulatory space to respond to social and economic needs at the national level.[48]

However, the norms and institutions of the Bretton Woods system were primarily conceptualised to guide and facilitate economic exchange between developed states, mainly because experiences of the 1930s influenced the design of the trade and monetary regimes of the Bretton Woods system. Strong multilateral institutions should help to avoid the mistakes that were made in the period before World War II. [49]

The Bretton Woods system remained incomplete. The organisation that would focus on trade liberalisation,[50] the International Trade Organization, did not come into being as envisioned. The Truman administration decided not to submit the Havana Charter, the organisation's establishing document, to the U.S. Congress for approval.[51] Parallel negotiations on tariffs resulted in the General Agreement on Trade and Tariffs (GATT). This agreement largely fulfilled the task of promoting free trade within the boundaries of internationally agreed rules.[52] Yet, its adoption and implementation left the United Nations "on the sidelines" in the field of global trade. [53] GATT developed the standards for commercial policies,[54] while issues that were vital for socio-economic progress in developing states only received little attention.[55] The voices of many of these states were left unheard in a multilateralism that pre-dated their declaration of independence.

Interestingly, negotiators at Bretton Woods had paid attention to developmental issues. The U.S. delegation's drafters of the Bretton Woods agreements drew on the experiences of the Good

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[48] Protectionism, driven by nationalist political movements, had inhibited international economic cooperation and stability before World War II. Therefore, the kind of liberalism that was restored after World War II differed from pre-war arrangements. In essence, embedded liberalism was unlike the economic nationalism of the 1930s, as it would be multilateral in character, and unlike the liberalism of the gold standard and free trade era, as its multilateralism would be predicated upon domestic interventionism. Ruggie, 1982, 413, 392–3.

[49] The International Monetary Fund and the International Bank for Reconstruction and Development, which later became the World Bank, were established to provide assistance during economic crises. *See*, U.S. Department of State Archive, "The Bretton Woods Conference, 1944," http://2001-2009.state.gov/r/pa/ho/time/wwii/98681.htm.

[50] The liberalisation of global trade was considered as an essential component for achieving monetary stability and full employment. *See*, Irwin, Douglas A., "The GATT in Historical Perspective," *The American Economic Review* 85, no. 2 (1995): 324–5.

[51] The Havana Charter was approved in April 1948, including the establishment of the International Trade Organization. During the following years, U.S. businesses lost their interest in the implementation of the Charter. Furthermore, the international situation changed in the late 1940s and early 1950s. *See*, Irwin, 1995, 325.

[52] Weiss, Thomas G., and Ramesh Thakur, *Global Governance and the UN: An Unfinished Journey*. Bloomington, IN: Indiana University Press, 2010, 178.

[53] Ibid., 183.

[54] Irwin, 1995, 327.

[55] Weiss and Thakur, 2010, 183.

Neighbour policies in U.S. relations with Latin America since the late 1930s. Several issues were part of the discussion, including debt relief and tariffs to support infant industries, and the prevention of capital flight from poorer states. Although provisions in the initial drafts were watered down, international development remained a core part of the final agreements. Yet, eventually the governance system of the international economy was quite different from the original intentions of the drafters.[56]

Essentially, the Bretton Woods system was geared to pre-empting domestic interventionism. The so-called system of embedded liberalism formed a compromise between multilateralism, free trade, and domestic social policy.[57] The free-trade, rules-based global liberal order was thus embedded in domestic socio-economic institutions. Moreover, the system's multilateral institutions would offer support in order to prevent states from taking protectionist measures and compromising the liberal international economic order.[58] But this system could hardly work for political elites in institutionally weak developing states. These elites would rather emphasise the notion of state sovereignty and seek exemptions from international obligations that they perceived as unfavourable or imposed by a superior economic and political order.[59]

Most developing states were unable to benefit from the socio-economic stability that the embedded liberalism in the form of the Bretton Woods system sought to provide. Although this system shaped their economies, the governments of developing states could hardly partake in the system's formal and informal processes of management.[60] Hence, adjustments in the global institutional set-up seemed inevitable. By the late 1960s, the legitimacy of the established international economic system was waning. Criticism of Bretton Woods was widespread.[61]

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[56] The trade component of the Bretton Woods system did not come into being. The draft document to establish the International Trade Organization, the Havana Charter, reflected the demands of developing states, including the principle of one-country-one-vote. Yet, neoliberals lobbied hard against this deviation from the "orthodox rules of free trade." They effectively ended the process of establishing this organisation. *See*, Slobodian, 2018, 125–33.

[57] By embedding economic liberalism in a set of domestic measures to achieve social objectives, which had become commonplace in most industrial states, the post-war international economic order gained sufficient legitimacy among capitalist industrial states. They accepted the leading role of the United States and relied on domestic policies to lessen negative effects of global free trade. To the U.S., stability of the economic transactions with its main trading partners and a reliable monetary system were most important. The liberalism that was restored after World War II differed in kind from the economic systems of the pre-war era. It was unlike the economic nationalism of the 1930s, mainly because embedded liberalism would be multilateral in character; and was distinct from the liberalism of the gold standard and free trade era during the late 19th and early 20th century, as its multilateralism would be predicated upon domestic interventionism. These arrangements resonated with the primary concerns of the U.S.: Global free trade would guarantee global peace and prosperity. Thus, this U.S.-led international economic system combined multilateral decision-making and economic liberalism at the international level with the requirements of domestic policies to address socio-economic frictions. *See*, Ruggie, 1982, 379–415, especially at 392–3.

[58] *See*, U.S. Department of State Archive, "The Bretton Woods Conference, 1944."

[59] Wälde, Thomas W., "A Requiem for the 'New International Economic Order': The Rise and Fall of Paradigms in International Economic Law and a Post-Mortem with Timeless Significance," in *Liber Amicorum Professor Ignaz Seidl-Hohenveldern in Honour of His 80th Birthday*, ed. Alfred Rest, Gerhard Hafner, Gerhard Loibl, Karl Zemanek, and Lilly Sucharipa-Behrmann (The Hague: Kluwer, 1998), 798.

[60] Spero, Joan E., and Jeffrey A. Hart, *The Politics of International Economic Relations* (Belmont, CA: Thomson, 2003), 174.

[61] Kindleberger, Charles P., "World Populism," *Atlantic Economic Journal* 3, no. 2 (1975): 1.

Generally, developing states wanted to obtain better controls on global resources and their own financial and material assets. There was a strong desire among these states to participate more effectively in decision-making on international economic issues and set the political agenda.[62] Former colonies felt particularly excluded from the emerging system of global economic governance, as they had not been represented at the negotiations at Bretton Woods. Since export-oriented commodity sectors had driven the integration of many former colonies into the globalising economy, their economic development was lopsided and vulnerable to changes in global commodity prices. Hence, resource-rich former colonies among the developing states would gain most from a structural transformation of the international economic system.

In the early 1970s, two important economic premises of the U.S.-led international economic order changed. They concerned the monetary underpinnings of the Bretton Woods systems and the price and availability of crude oil – the world's most important commodity. First, in 1971 U.S. President Richard Nixon suspended the free convertibility of the U.S. dollar into gold at a fixed rate. This ended the original form of the Bretton Woods system.[63] Second, the U.S. could no longer act as "supplier of last resort" of crude oil. Subsequently, Arab oil exporters in the Persian Gulf region saw the opportunity to benefit from their market position politically by cartelising their production. In 1973, they successfully deployed their "oil weapon"[64] against Western industrial states for the first time.[65]

Inspired by this move, developing states' efforts to promote structural changes to the international economic system gained momentum. The UN General Assembly became the staging ground for their demands; and institutional changes at UN level added to the momentum. After consecutive

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[62] Bhagwati, Jagdish N., "Introduction," in *The New International Economic Order: The North-South Debate*, ed. Jagdish N. Bhagwati (Cambridge, MA: MIT Press, 1977), 1, 7–8.

[63] The U.S. Treasury had pegged the price of the dollar at U.S.$35.00 per ounce of gold by freely buying and selling gold. Other states maintained the parity of their currencies with the U.S. dollar by either buying or selling dollars. By doing so, each currency was anchored to the dollar and indirectly to gold. This virtual fixed exchange rate system had been operational since 1958. Yet, gold convertibility only applied to monetary authorities of other states and certain international organisations, as private citizens had lost the rights to convert dollars into gold in 1934. In the late 1960s, the system lost its appeal when adjusting exchange rates proved increasingly difficult. There were also concerns about the liquidity in the face of increasing trade volumes and the future convertibility of U.S. dollars into gold at fixed prices. *See*, Bordo, 1993, 49; Slobodian, 2018, 241.

[64] The 1973 embargo had a great impact on the international political economy. After the embargo and subsequent price hikes, several rounds of oil diplomacy between consumer and producer states took place. Yet, in the debate between developed and developing states broader issues of economic cooperation eventually replaced energy as the single topic. Industrial states became more inclined to negotiate about a new international economic order. Nevertheless, for most industrial states this topic only occupied a peripheral place on the hierarchy of important policy issues. At that time, differences had emerged between the U.S. and some member states of the European Economic Community (EEC), in particular France, on how to approach negotiations with OPEC. France countered an initiative by the U.S. to pursue a collective oil diplomacy of consumer states by proposing both a meeting between the EEC and Arab oil producers and a conference on energy under the auspices of the United Nations. By doing so, France brought oil diplomacy from its Atlantic context to the global stage and initiated the call for the Sixth Special Session of the General Assembly. On the request of Algeria, the subject of the session would be raw materials and development. *See* for more on the link between oil diplomacy and the negotiations about the NIEO, Gosovic, Branislav, and John Gerard Ruggie, "On the Creation of a New International Economic Order: Issue Linkage and the Seventh Special Session of the UN General Assembly," *International Organization* 30, no. 2 (1976): 309–45.

[65] Yergin, Daniel, *The Prize: The Epic Quest for Oil, Money, and Power* (New York, NY: Simon and Schuster, 1991), 588–612.

waves of decolonisation,[66] developing states outnumbered industrial ones in the UN General Assembly. They felt encouraged to collectively pursue their interests at the international level by relying on strategies such as trade unionism[67] and cartelisation.[68] Fairer prices for commodity exports and a greater share of the global income and wealth were the developing world's main long-term objectives. This time, developing states specifically focused on political and institutional aspects in pursuing these objectives.[69] This was a clear shift away from the more general calls for development policies at international level that dominated the 1950s and 1960s.[70] An institutional transformation of the global economic order seemed possible.

The NIEO debate in the UN General Assembly and the documents that emerged from it shaped the discourse on development issues and, subsequently, the evolution of international environmental law. Knowledge of the dynamics of NIEO debate that took place in the mid-1970s is vital, mainly because this discourse greatly influenced the UN climate regime. Therefore, a closer look at the main topics that shaped the NIEO debate is warranted.

Developing states' efforts to create a new economic order led to the Sixth Special Session of the UN General Assembly on Raw Materials and Development that took place from 9 April to 2 May 1974.[71] This was the first time in the history of the United Nations that developing and developed states discussed the link between the institutional predicaments in the international economic system and the lack of socio-economic development.[72]

The debates during this special session of the UN General Assembly produced a framework for a new international economic order. The documents can be described as "a body of general legal, political and economic principles" that were "intended to provide a blueprint for an alternative

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[66] The period from 1945 to 1960 witnessed a broad movement of decolonisation that added 54 newly independent, mainly poor states to the world community and the institutions of the United Nations.

[67] This term describes a behaviour that resembles actions of trade unions – and socialist parties – in industrial states vis-à-vis the employers of the workers they represent or the industrial elites in general. Yet, Mayall points to the fact that the analogy on which this comparison with domestic politics in industrial states was based, was false in one crucial respect – at that time, democratic parties were able to insist on positive reforms aimed at the redistribution of income because workers were also citizens. *See*, Bhagwati, 1977, 1; Green, Reginald Herbold, and Hans W. Singer, "Toward a Rational and Equitable New International Economic Order: A Case for Negotiated Structural Change," *World Development* 3, no. 6 (1975): 428; Mayall, James, "The Liberal Economy," in *The Community of States: A Study in International Political Theory*, ed. James Mayall (London: Allen and Unwin, 1982), 109.

[68] The effective use of cartelisation by the Organization of the Petroleum Exporting Countries (OPEC) reinforced the choice for this approach. De Montbrial, Thierry, "For a New World Economic Order," *Foreign Affairs* 54, no. 1 (1975): 61–2; *see* for an analysis of the relationship between Arab oil policies and the establishment of a new international economic order, Shihata, Ibrahim F.I., "Arab Oil Policies and the New International Economic Order," *Virginia Journal of International Law* 16, no. 2 (1976): 261–88.

[69] Several bodies and programmes under the UN GA that facilitate developing states' needs were established under the UN GA during the 1960s and early 1970s, especially the United Nations Conference on Trade and Development (UNCTAD) in 1964, the United Nations Development Programme (UNDP) in 1965, and the United Nations Environmental Programmes (UNEP) in 1972.

[70] Bhagwati, 1977, 7.

[71] Gamble Jr, John King, and Maria Frankowska, "International Law's Response to the New International Economic Order: An Overview," *Boston College International and Comparative Law Review* 9, no. 2 (1986): 258; Chatterjee, S.K., "The Charter of Economic Rights and Duties of States: An Evaluation after 15 Years," *International and Comparative Law Quarterly* 40, no. 3 (1991): 683.

[72] Gosovic and Ruggie, 1976, 316–7.

international economic system."[73] Three documents constitute the core of the rule-making efforts to effect change in the international economic system – i.e. the *Declaration on the Establishment of a New International Order*, the *Programme of Action on the Establishment of a New International Economic Order*, and the *Charter of Economic Rights and Duties of States*.[74]

The *Declaration on the Establishment of a New International Economic Order* (NIEO Declaration) contains 20 principles that emphasise the core values of the new order.[75] Three principles stand out. Principle (n) calls for "[p]referential and non-reciprocal treatment for developing states, wherever feasible, in all fields of international economic co-operation whenever possible."[76] Principle (o) demands "favourable conditions for the transfer of financial resources to developing countries."[77] Principle (p) stipulates that developing states should have "access to the achievements of modern science and technology" and receive technology "in forms and in accordance with procedures which are suited to their economies."[78] Both the *Programme of Action on the Establishment of a New International Economic Order* and the *Charter of Economic Rights and Duties of States* reiterate the notions of non-reciprocity in trade relations between developed and developing states as well as the need for preferential treatment of developing states and financial assistance.[79] The Charter of Economic Rights and Duties was adopted at the 29th Session of the UN General Assembly on 12 December 1974 by a vote of 120 in favour to six against, with ten abstentions, mainly because of the numerical superiority of developing states in this forum. The states that voted against it or abstained were all developed states.[80]

Despite the need to address the considerable imbalances in the international economic system, the adoption of multilateral agreements could not overhaul the existing international economic order. In the 1950s and 1960s many governments were concerned about the urgency to assist developing states and willing to alleviate the suffering in these parts of world. Yet, a fast solution to these problems was impossible. Complex structural adjustment were necessary.

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[73] Tomuschat, Christian, "New International Economic Order," in *Encyclopedia of Public International Law – Vol 3*, ed. Rudolf Bernhardt, (Amsterdam: Elsevier, 1997), 578.
[74] UN GA Res. 3201 (S-VI), 1 May 1974 (Declaration on the Establishment of a New International Economic Order); UN GA Res. 3202 (S-VI), 1 May 1974 (Programme of Action on the Establishment of a New International Economic Order); UN GA Res. 3281 (XXIX), 12 December 1974 (Charter of Economic Rights and Duties of States).
[75] UN GA Res. 3201 (S-VI), 1 May 1974, para 4.
[76] Ibid., para 4 (n).
[77] Ibid., para 4 (o).
[78] Ibid., para 4 (p).
[79] UN GA Res. 3202 (S-VI), 1 May 1974, para I, 3 (b), II, 2, III, (a) and (b); UN GA Res. 3281 (XXIX), 12 December 1974, Articles 13, 18, 22.
[80] Belgium, Denmark, the Federal Republic of Germany, Luxembourg, the United Kingdom, and the United States voted against the Charter, while Austria, Canada, France, Ireland, Israel, Italy, Japan, the Netherlands, Norway, and Spain abstained. *See*, Tiewul, S. Azadon, "The United Nations Charter of Economic Rights and Duties of States," *The Journal of International Law and Economics* 10, no. 2–3 (1975): 645; *Cf*., (1975) 16 ILM 263 and 265.

Thomas W. Wälde observes that an economic order cannot exist separately from society, neither nationally nor internationally. An economic order entails relationships in society and prevailing economic ideas. Therefore, international economic law can merely facilitate existing trends in the global economy. The international legal system that governs economic interaction – in the broadest sense of the word – necessarily reflects current ideas or shared understandings of how to conduct economic relations.[81] Neglecting this instrumental and formal function of law rendered the NIEO movement illusionary, while changes in the global economy made the implementation of the NIEO resolutions impossible.[82]

Despite the fact that the *Charter of Economic Rights and Duties* only was a political declaration that presented new concepts for economic relations, it had an important ideational effect on future legal instruments. The principles included in this Charter carried an inspiring meaning. The proponents of the NIEO saw law not as an instrumental and facilitative tool but intended to restructure existing interests, socio-economic relations, and the underlying legal and institutional culture by introducing principles of a new order.[83]

Indeed, a new trend was noticeable at the international level towards adopting principles of economic policy conduct rather than enforceable rules. This was in contrast to the period immediately after World War II, when the principles were already agreed upon and rules were made to establish the economic order.[84] The principles that were included in the NIEO documents failed to become shared understanding of the international community, in particular in the economic realm. Nevertheless, the NIEO movement shaped perceptions and approaches of developing states for decades, both with respect to national policies and their initiatives in international organisations, especially within the UN system.[85] The negotiations of the first international legal instrument to mitigate climate change more than one and a half decades after the NIEO debate underpinned its unabated relevance.

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[81] *See* for an account of how predominant ideas change the structure of economies, Blyth, Mark, *Great Transformations: Economic Ideas and Institutional Change in the Twentieth Century*. Cambridge: Cambridge University Press, 2002.

[82] The political and economic premises of the NIEO proved unworkable. Furthermore, other approaches to development entered the discourse. In addition, economic developments in the developing world hampered an implementation of ideas that had inspired the NIEO debate, as the debt crisis that plagued many developing states in the 1980s made the maintenance of subsidised state-owned companies impossible. With the economic downturn of the Soviet Union during the 1980s and its collapse in the early 1990s, a real-world alternative to the capitalist economic system had vanished; and by that time the unity of the developing world with respect to preferable economic policies was fading. *See*, Wälde, 1998, 778–782, 800, 802.

[83] Ibid., 800.

[84] Learning the lessons of the 1930s, negotiators of the post-war arrangements agreed to limit the economic sovereignty of states by rules of positive law, in order to achieve stability and prosperity. *See*, Roessler, Frieder, "Law, De Facto Agreements and Declarations of Principle in International Economic Relations," *German Yearbook of International Law* 21 (1978): 28, 29.

[85] Tomuschat, Christian, "Die Charter der wirtschaftlichen Rechte und Pflichten der Staaten: Zur Gestaltungskraft von Deklarationen der UN-Generalversammlung" [The Charter of Economic Rights and Duties of States: On the creative power of declarations of the UN General Assembly], *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht* 35 (1976): 446, 490; Wälde, 1998, 773.

The NIEO debate put forward drivers of structural change and saw the rise of new actors at the international level. Indeed, a significant novelty of the NIEO debate was the leading role that China sought to play. During the 1974 plenary debate, Deng Xiaoping addressed the UN General Assembly on behalf of the Chinese leadership.[86] He presented the leadership's view of the global division of power and described the "two superpowers" – the United States and the Soviet Union – as the biggest sources of "exploitation and oppression." He also criticised Western developed states – the "Second World" – for maintaining paternalistic relations with their former colonies. The world, according to Deng, consisted of these two parts and an overwhelmingly poor and deprived third part, i.e. the "Third World." Deng declared that China belonged to the poor and deprived. Therefore, he explicitly endorsed all proposals on adjusting the international economic order that developing states had prepared for this session.[87]

Obviously, the spirit of this debate differed from the interactions at the UN in the 1950s and 1960s. At that time, there was a willingness among the members of the UN to address development at the international level. However, institutional, political, and ideological complexities impeded progress in this respect.[88] More often than not, developing states were divided on vital issues of international economic relations.[89] International instruments could not lead to an improvement of the situation in developing world.

The NIEO debate revealed irreconcilable differences between developed and developing states. The debate's nature was adversarial. In many ways, the NIEO debate foreshadowed the deliberations that would shape the climate negotiations two decades later, when the main themes would again be preferential and non-reciprocal treatment of developing states and the necessity of technological assistance. The NIEO debate, similar to the Stockholm Declaration's drafting process, saw China play an active role in support of developing states' demands when these were in line with its own priorities.

Samuel S. Kim notes that in the 1970s China's participation was most devoted in negotiations when the institutional framework did not predate its admission to the UN and the issues at stake

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[86] This speech was the first major address given by a Chinese leader in the history of the United Nations. *See* for the text of Deng's speech, "邓小平在联大第六届特别会议上的发言" [Deng Xiaoping's speech at the Sixth Special Session of the UN General Assembly] of 10 April 1974, 人民网 [People's net], 23 October 2001, http://www.people.com.cn/GB/shizheng/252/6688/6715/20011023/588430.html.

[87] Deng Xiaoping's speech at the Sixth Special Session of the UN General Assembly, 10 April 1974.

[88] Throughout the post-war decades, time lags and distortions characterised the coordination of development at international level, mainly because these efforts relied on experiences made in the previous decade or development phase. This deferred process resulted in inappropriate measures, unable to deal with new challenges. *See*, Singer, Hans W., and Sumit Roy, *Economic Progress and Prospects in the Third World: Lessons of Development Experience since 1945* (Aldershot: Edward Elgar, 1993), 10.

[89] An example was the inability to come together in order to adopt a resolution to remedy global inequalities in trade in 1961. *See*, Kamga, 2018, 209.

were "broad declaratory principles or normative rules to guide the future of international politics."[90] The Chinese leadership focused on activities that involved the development of new rules, principles, and norms in the international legal order.[91]

During the climate change negotiations in the early and mid-1990s, when once again new rules were made and fundamental economic interests were at stake in the context of global environmental problems, China resumed and further expanded this role.[92] Ahead of the 1992 Earth Summit, China presented itself as a leader of the developing world.[93] To facilitate its participation in the international climate negotiations, the Chinese leadership set up an inter-agency group in 1988. In 1990, the Chinese government created the National Climate Change Coordination Group that assessed the negotiations about the framework convention on climate change and prepared a response strategy, including the formula that states have a common but differentiated responsibility for causing climate change.[94]

During the Ministerial Conference of Developing Countries on Environment and Development that took place in Beijing in June 1991, forty-one developing states summarised their perspectives on global efforts to achieve sustainable development and issued the Ministerial Declaration on Environment and Development (Beijing Declaration).[95] This Declaration reiterates the responsibility of the developed world for global environmental degradation (para 7). Based on their responsibility for the harm they have caused to the global environment and the resources they have to tackle these problems, developed states have to take the lead to implement protection and conservation measures (para 8). Paragraph 13 points to the responsibility of developed states for causing climate change. It rejects any obligations for developing states "in the near future." It also calls for technological and financial assistance for developing states in their efforts to cope with climate change. This declaration was a foretaste of how the adversarial undertones of the NIEO debate would resurface again during the climate negotiations.

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[90] Kim, Samuel S., *China, the United Nations, and World Order* (Princeton, NJ: Princeton University Press, 1979), 331.
[91] Ibid., 428–9.
[92] In the 1990s, China began to caucus with the G-77. Yet, it did not officially apply for membership. Since the G-77 does not grant states observer status, it considers China as a member with special status. In the 1990s, China intensified its cooperation with the G-77, mainly because western states had implemented sanctions against China after the leadership had ordered the People's Liberation Army to suppress non-violent protests in Beijing and other large cities on 4 June 1989 (known as Tiananmen massacre). *See* Swart, Lydia, "Organizational Framework of the Group of 77," in *The Group of 77: Perspectives on Its Role in the UN General Assembly*, ed. Lydia Swart and Jakob Lund (New York, NY: Center for UN Reform Education, 2013), 28–9.
[93] Heggelund, Gørild, and Ellen Bruzelius Backer, "China and UN Environmental Policy: Institutional Growth, Learning and Implmentation," *International Environmental Agreements* 7, no. 4 (2007): 421.
[94] Tangen, Kristian, Gørild Heggelund, and Jørund Buen. "China's Climate Change Positions: At a Turning Point?" *Energy and Environment* 12, nos. 2–3 (2001): 238; Bo Yan, 2013, 198.
[95] 北京宣传[Beijing ministerial declaration on environment and development], 19 June 1991 [Chinese text with author].

The ministerial meeting also clarified its position on the concept of common but differentiated responsibilities and other principles. As a result, the Chinese delegation was able to forge a common position within the G-77 and China grouping on the principles that should be incorporated in the Convention. This common position was published in a joint statement in December 1991, preceding of the Earth Summit in 1992.[96]

In Paragraph 2 (d), the joint statement considers the protection of the climate as an obligation of all states. This obligation should be

> "*carried out with different time-frames for implementation in accordance with common but differentiated responsibilities and capabilities between developing and developed countries and taking fully into account that the largest part of emissions of greenhouse gases have been originating from the developed countries and those countries have the main responsibility in combating climate change and the adverse effects thereof*."[97]

It is important to highlight the fact that this proposal for the CBDR principle was published by the G-77 and China grouping. Although China was the main promoter of the CBDR principle, it deliberately sought the support of other developing states. This approach greatly influenced how the principle was received among other participants in the negotiation process. The CBDR principle was not considered as a Chinese proposal but entered the negotiations as a demand of the developing world. This strategic choice might have helped the proposal to find support among many developed states. Yet, it also resulted in the hybrid nature of the CBDR principle in the UN climate regime. The CBDR principle in the UN climate regime was thus informed by both China's interest in unimpeded economic development and economic sovereignty as well as the legacy of the UN developmental debates of the 1970s. Most international commentators emphasise the latter facet of the CBDR principle, while the Chinese discourse centres upon the principle's usefulness in international negotiations. Meanwhile, the discourse on developmental issues in international law absorbed the CBDR principle. It became a principle of international environmental law in the broader context of differential treatment.

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[96] *See*, INC document A/AC.237/WG.1/L.8, 19 December 1991 (Joint Statement of the Group of 77, made by its Chairman (Ghana) at the fourth session of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change); Dasgupta, Chandrashekhar, "The Climate Change Negotiations," in *Negotiating Climate Change: The Inside Story of the Rio Convention*, ed. Irving M. Mintzer and J. Amber Leonard (Cambridge: Cambridge University Press, 1994), 138.

[97] INC document A/AC.237/WG.1/L.8.

This brief overview of the evolution of UN efforts to deal with developmental concerns showed that addressing these concerns has been a two-pronged process. Two contrasting approaches to global socio-economic inequalities influenced the emergence of international environmental law and the way in which it deals with developmental issues. First, from the 1950s onwards consecutive UN GA resolutions tried to deal with increasing poverty and deprivation in the developing world. The 1960s and 1970s were even designated as "development decades." This process was cooperative, involving both developed and developing states. It accompanied the debate about environmental cooperation. By including the concept of sustainable development in the 1992 Rio Declaration, this legacy was continued.

Second, during the 1970s a new trait became obvious in the development discourse related to the NIEO debate. This discourse was based on ideology and antagonism. A systemic change was envisaged. At crucial moments in the evolution of international environmental law – such as the Stockholm Conference and Rio Earth Summit – China, together with the Group of 77, chose this assertive approach to influence outcomes of international rulemaking. Sections three and four of this chapter will show that this method had considerable impact on the design and reception of the UN climate regime. The last part of this section summarises how developmental concerns contributed to the evolution of differential treatment in international environmental law.

4.2.3. Differentiation in international environmental law

By adopting the above-mentioned UN development-decade resolutions, the UN General Assembly tried to foster economic growth in the deprived parts of the world. Although they could hardly improve the overall situation in the developing world, these resolutions point to two salient matters. First, from the 1950s onwards there has been a growing awareness of disparities in the level of socio-economic development among the members of the international community. Second, many states supported the idea of a collective response to developmental issues at the international level. Promoting development in the poorer parts of the world gradually turned into a vital aspect of international cooperation.[98] Subsequently, efforts to accommodate the needs of developing states in international legal agreements became commonplace in the form of differential treatment, especially in international environmental law.

[98] Georges Abi-Saab notes that during the Cold War the United Nations spent 80% its financial resources to activities in the field of development assistance. *See*, Abi-Saab, Georges, "Whither the International Community?," European Journal of International Law 9, no. 2 (1998): 263.

In the post-war period, differential treatment in international law emerged from preferential provisions that were part of international agreements in the field of trade and economic cooperation[99] – such as Articles XVIII and XXXVI (8) GATT 1947.[100] In the wake of decolonisation, preferential treatment was afforded in order to acknowledge developing states' difficulties to prosper in an international economic system that is based on the formal legal equality of states.

Following the debt crisis in the 1980s and the end of the Cold War in 1990, preferential treatment in favour of developing states became less common in international economic lawmaking. By that time, the impetus for achieving equity in international economic relations had diminished. Beginning in the 1980s neoliberal economic ideas that emphasised reliance on market forces influenced national economic policies both in developed and developing states. During the 1990s, neoliberal globalism emerged, including international institutions that promoted and implemented its economic ideas. Systemic change at the international level to take into account the needs of developing states was no longer an issue. At the same time, however, the emphasis on global equity or fairness was increasing in other fields of international law.[101] The important role that differential treatment played in the evolution of international environmental law, especially after the end of the Cold War, is a case in point.

This subsection first explains the nature and purpose of differential treatment. Then, it shows how differential treatment is afforded in instruments of international environmental law. This overview helps to reflect on the role of the CBDR principle in the UN climate regime (section 4.3.). The purpose of this subsection is to elaborate a definition of the CBDR principle as a specific form of differential treatment and to proceed to the examination of the CBDR principle in the UNFCCC and KP.

4.2.3.1. Defining differential treatment

Differential treatment relates to several concepts of international (environmental) law – i.e. sovereign equality, solidarity, substantive equality, and equity and distributive justice. The instrument of differential treatment in international environmental law acknowledges both the interdependence of states in a globalising economy and the internationalisation of problems,

[99] Cullet, Philippe, "Common but Differentiated Responsibilities," in *Research Handbook on International Environmental Law*, ed. Malgosia Fitzmaurice, David M. Ong, and Panos Merkouris (Cheltenham: Edward Elgar, 2010), 172.

[100] Article XVIII GATT 1947 recognises the situation of states with low standards of living "in the early stages of development" and allows governmental assistance as well as the implementation of protective measures or other instruments that affect imports. Article XXXVI GATT 1947 states principles and objective and allows for special measures for less-developed states parties "to promote their trade and development." *See*, GATT 1947, https://www.wto.org/english/docs_e/legal_e/gatt47_e.pdf.

[101] Cullet, 2010, 173; Slobodian, 2018, 283.

especially the degradation of the environment. Under these circumstances, the international community cannot restrict itself to merely regulating the co-existence of sovereign states and international cooperation based on reciprocity.[102] In addition, the task of solving global problems that result from environmental degradation clearly constitutes a common or "shared interest"[103] of all states. Legal instruments and concepts can help to effectively respond to such challenges through collective international action, while avoiding interference with the principle of *state sovereignty*.[104]

Differential treatment in international environmental law has evolved as a tool through which negotiators of international environmental instruments can manage tensions and strike a balance between the need for a collective response and state sovereignty. In this regard, treaty provisions that assign different commitments to different categories of states parties are the most obvious form of differential treatment.

Generally, developing states are the addressees of provisions that differentiate between states parties. These provisions offer some form of support for a certain category of states in order to enable them to participate in the implementation of the regime in question.[105] The notion of support can be phrased differently. Norms that differentiate are the opposite of absolute norms that apply to all states in the same way and contain a precise description of what is expected of the parties. When applying an absolute norm, it is not necessary to take into account any factors that might distinguish states parties' individual circumstances.[106]

Accordingly, two types of norms can be used to facilitate the participation of developing states in international environmental instruments.[107] First, differential norms provide more preferential standards for a certain category of states. Examples are delayed implementation of emissions reductions (grace periods) or less rigid reporting requirements.[108] Second, contextual norms seem to treat all states identically. However, the application of the norms permits or even requires the consideration of certain characteristics that distinguish the states parties. Therefore, the application of contextual norms involves a balancing of various interests and characteristics. Given the flexibility that contextual norms entail, parties can easily adapt their application to changing circumstances.

[102] Historically, the neutrality of the law is based on the premise that all states are legally equal. Thus, under this premise treaties are "just" when they entail a reciprocity of obligations among the parties. *See* on the shift from managing co-existence towards more cooperation, albeit with contention, Abi-Saab, 1998, 248–65; *see* on differential treatment in this context, Cullet, Philippe, "Differential Treatment in International Law: Towards a New Paradigm of Inter-state Relations," *European Journal of International Law* 10, no. 3 (1999): 553; Cullet, 2010, 3.
[103] *See* for the definition of the notion of "shared interest," Brunnée, Jutta, "'Common Interest' – Echoes from an Empty Shell: Some Thoughts on Common Interest and International Environmental Law," *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht* 49 (1989): 807.
[104] Cullet, 1999, 549, 550.
[105] Ibid., 551.
[106] Magraw, 1990, 76.
[107] Ibid., 73.
[108] Ibid., 73–4.

An example of contextual norms is the requirement of considering the socio-economic situation of developing states.[109]

From a conceptual perspective, the practice of differential treatment entails a notion of *solidarity and partnership*.[110] No doubt, solidarity and partnership are vital features of the international community.[111] A sense of solidarity emerged with the further expansion of international cooperation during the second half of the 20th century, including the promotion of development in the poorest parts of the world. States work together based on the notion of partnership. Principle 7 of the 1992 Rio Declaration urges states to "cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem."[112] In addition, embracing solidarity in international relations acknowledges that states have common interests and collective action is the best way to realise these interests. When pursuing a common goal, it can be expected that developed states assist developing states. Yet, this also implies that developing states have corresponding obligations.[113]

Generally, pursuing shared global interests is a lasting cooperative effort. Differential treatment is thus afforded based on the expectation of a long-term relationship.[114] Being party to a treaty suggests a long-term engagement with the subject matter. Therefore, solidarity as basis for differential treatment is circumscribed by the factor of time in two ways. First, differentiation aims to create a long-term balance of the parties' interests. Second, the inequality of obligations is not permanent.[115]

Solidarity entails the expectation of long-term mutual benefits in exchange for a short-term deviation from the principle of reciprocity and sovereign equality. Differential treatment does not result in permanent exceptions, mainly because it is closely related to the socio-economic circumstances that were relevant for including differentiated provisions in a legal regime in the first place. In other words, for a certain period specific support is justified based on the actual situation of

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[109] Ibid., 74–6.

[110] The notion of solidarity implies a sense of partnership. Both concepts form the ethical basis of inter-state relations and are essential for addressing problems when common action is necessary. *See*, Cullet, 1999, 558; Cullet, Philippe, *Differential Treatment in International Law*. Oxford: Oxford University Press, 2003, 1.

[111] The term "international community" seeks to communicates the fact that there are interests that transcend those of individual states. These interests are not fully contextualised by the notion of bilateralism, the classic paradigm in international relations. *See*, Simma, Bruno, and Andreas L. Paulus, "The 'International Community': Facing the Challenge of Globalization," *European Journal of International Law* 9, no. 2 (1998): 268.

[112] Principle 7 Rio Declaration.

[113] Cullet, 2010, 168; MacDonald, Ronald St. John, "Solidarity in the Practice and Discourse of Public International Law," *Pace International Law Review* 8, no. 2 (1996), 281.

[114] Cullet, 2010, 168–9; MacDonald, 1996, 280–2.

[115] MacDonald, 1996, 281.

the state in question. Therefore, differential treatment creates a temporary legal inequality to achieve *substantive equality*.[116]

Supporting developing states in this way is only possible when inequalities in wealth or natural endowment are recognised and related to the cooperation on the subject matter. By assisting a weaker state party in contributing to the objective of the treaty in question, the weaker state is enabled to contribute to a regime in a substantively more equal way.[117] This state is brought into a position in which cooperation with other states to realise the treaty's objectives is more feasible and likely, which benefits the international community as a whole.

Treating "weak" and "strong" states equally produces inequitable outcomes.[118] Compensating (temporary) weaknesses is thus a way to realise more *equity* in international relations, albeit limited to the treaty regime in question. Differential treatment thus translates the concept of intra-generational equity to the inter-state level.[119] Therefore, the material assistance that is provided in the context of differential treatment does not constitute a form of outreach. The material contributions that developed states provide as part of differential treatment aim to bring about *distributive justice*, albeit in a contextualised way.

Since differential treatment empowers the weak instead of promoting charitable actions based on benevolence, it is important to note that contributions of developed states in the context of differential treatment are not considered as developmental aid. The main purpose of differential treatment is to increase the level of cooperation within the legal system by adapting it to socio-economic realities, which rules based on the notion of legal equality are unable to adequately incorporate.[120] This aspect is vital for addressing global environmental problems, mainly because the implementation of MEAs usually affects the socio-economic situation of the participating states.

Differential treatment helps to accommodate various extra-legal factors, either by making available financing or other resources or by refraining from economic development opportunities that damage the environment. By doing so, it enables drafters of international legal instruments to opt for balancing the principle of sovereign or judicial equality in international environmental law through differentiating rights and obligations, based on extra-legal considerations. Factors that justify differentiation can be divergences in socio-economic development and unequal capacities to implement a specific norm. Overlooking these circumstances would lead to substantively unjust

[116] Cullet, 1999, 557; Cullet, 2003, 30; Cullet, 2010, 166; Kellersmann, 2000, 39.
[117] *See* also, Cullet, 1999, 553–5.
[118] Ibid., 554.
[119] Hey, "Common but Differentiated Responsibilities," 2011, para 12.
[120] Cullet, 2010, 162, 166.

outcomes. Thus, differential treatment can enhance the substantive equity in the context of international environmental regimes relating both to the aim of the regime and the situation of developing states that receive assistance as a result of differential treatment. By contextualising the provision of justice, differential treatment helps to make cooperation in the existing legal order more equitable and constructive.[121]

Finally, the degradation of the environment necessarily entails the issue of responsibility. Generally, states are to different degrees responsible for harmful impacts on the global environment, mainly because levels of industrialisation vary. The UN GA Resolution 44/228 that announced the 1992 UN Conference on Environment and Development points to the responsibility of states and notes that "the largest part of the current emission of pollutants into the environment […] originates in developed countries" and concludes that "those countries have the main responsibility for combating such pollution."[122] Since global environmental degradation is difficult to trace to one individual state or polluting entity in a state, developed industrialised states as a category are considered to have a greater responsibility for global environmental problems.

In this context, the polluter-pays principle might come to mind.[123] Indeed, the polluter-pays principle is one of the basic principles of environmental law that authorities apply in cases of environmental pollution. However, the term "responsibility" related to differential treatment does not entail this legal meaning.[124] Principle 16 of the Rio Declaration leaves enforcement with respect to instances of pollution with national authorities.[125] Thus, the designation of greater responsibility with respect to differential treatment does not infer any legal responsibility or liability that occur to developed states in the international realm. Above all, regarding global environmental problems their actions or those by actors on their territories cannot be pinned down on any specific polluting activity and the damage it might have caused. Instead, the notion of developed states' greater responsibility alludes to the *contribution* to environmental degradation, while the degree of individual states' contributions remains indeterminate. In this reading, responsibility means that developed states should own the global environmental crisis and be the first to respond to its

[121] Cullet, 1999, 551, 556; Honkonen, 2016, 161.
[122] UN GA Res. 45/228, 22 December 1989 (United Nations Conference on Environment and Development), para I (9).
[123] The International Law Association states that Principle 7 of the Rio Declaration "reflects" the polluter-pays principle. International Law Association (ILA), "International Law Association Buenos Aires Conference (1994): International Committee on Legal Aspects of Sustainable Development," *ILA Reports of Conferences* 66 (1994): 116; *see* also, Honkonen, 2009, 198.
[124] The final version of Principle 7 of the Rio Declaration that includes the CBDR principle removed any notion of legal responsibility of developed states for causing environmental degradation. *See*, French, 2000, 38; Cullet, Philippe, "Principle 7: Common but Differentiated Responsibilities," in *The Rio Declaration on Environment and Development: A Commentary*, ed. Jorge E. Viñuales (Oxford: Oxford University Press, 2015), 235.
[125] Principle 16 of the Rio Declaration leaves the polluter-pays principle in the context of national law enforcement. Principle 7 (CBDR) thus creates a separate international responsibility. *See*, Kellersmann, 2000, 42.

consequences. The term "responsibility" is used in this meaning in the following sections (*see* the overview of the Rio Declaration in subsection 4.2.3.3.).

The intrinsic link between the contribution to a global problem and responsibility for its mitigation is also included in the formulation of the principle of common but differentiated responsibilities. In this wording, responsibility for the common problem that an international instrument aims to solve is explicit. The CBDR principle greatly influenced international environmental rulemaking, especially on climate change mitigation. The next subsection explores how differentiation and the CBDR principle is operationalised in international instruments that guide cooperation on environmental issues.

4.2.3.2. International environmental cooperation and the emergence of the CBDR principle

The principle of CBDR is either part of or implicitly inspires provisions applicable to developing states in several international environmental instruments.[126] It seems justified that developing states expect the inclusion of differentiated provisions in MEAs and other instruments to ensure a broad participation. Yet, developed states have been cautious to create strong "precedents" that would lead to an automatic application of the CBDR principle to environmental affairs.[127] Hence, the explicit inclusion of the CBDR principle and the scope of differentiated provisions that are inspired by the principle are specific to the instrument or regime that state them. The following overview explores the CBDR principle's emergence.

To contextualise the subsequent evaluation of the CBDR principle in the UN climate regime, the following overview of the operationalisation of the CBDR principle focuses on the 1992 Rio Declaration on Environment and Development[128] and three MEAs that were adopted at about the same time as the UNFCCC and KP. The overview begins with an analysis of the CBDR principle in the 1992 Rio Declaration and then discusses differentiated provisions in the 1992 Convention on Biological Diversity (CBD)[129] and 1994 United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD).[130]

[126] Honkonen, 2016, 166, 180.
[127] Ibid., 177.
[128] Rio Declaration on Environment and Development, 14 June 1992, UN Doc. A/CONF.151/26 (vol. I), 31 ILM 874 (1992).
[129] Convention on Biological Diversity, 29 December 1993, [1993] ATS 32, 1760 UNTS 79, 31 ILM 818 (1992).
[130] United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, 14 October 1994, 1954 UNTS 3, [2000] ATS 18, 33 ILM 1328 (1994).

The subsection finishes with an examination of differentiation in the UN ozone regime, consisting of the 1985 Vienna Convention for the Protection of the Ozone Layer[131] and 1987 Montreal Protocol on Substances that Deplete the Ozone Layer.[132] This regime is generally hailed as a success story. Given its numerous similar features, the fight against the depletion of the ozone layer is often compared with climate change mitigation. The final part of this subsection will show that the ozone regime can be regarded as an eye-opening microcosm of the UN climate regime.

A) Rio Declaration on Environment and Development

The 1992 Rio Declaration is different from the documents that will be discussed in the rest of this subsection, as it constitutes a non-binding declaration. The Rio Declaration had a great ideational influence on international environmental law. It primarily establishes "a new and equitable global partnership"[133] that helps to structure global environmental cooperation. The Rio Declaration presents 27 principles that aim to guide the further institutionalisation of international cooperation on environmental affairs. The goal of global cooperation in this realm is the pursuit of sustainable development,[134] which can only be achieved when environmental protection is "an integral part of the development process."[135] Most importantly, the Rio Declaration includes the CBDR principle in the formulation that is also used in the UNFCCC and KP.

The wording of the principle appears in the second sentence of Principle 7:

> ***Principle 7***
>
> *States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.*

[131] Vienna Convention for the Protection of the Ozone Layer, 22 March 1985, 1513 UNTS 293, [1988] ATS 26, 26 ILM 1529 (1987).
[132] Montreal Protocol on Substances that Deplete the Ozone Layer, 16 September 1987, 1522 UNTS 3, 26 ILM 1550 (1987), [1989] ATS 18.
[133] Preamble of the Rio Declaration, para 4.
[134] Principle 1 Rio Declaration.
[135] Principle 4 Rio Declaration.

Principle 7 has a dual conceptual foundation – i.e. partnership and equity. Its three sentences reflect this dual foundation. The first sentence contains the duty of all states parties to "cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem." Subsequently, the second sentence acknowledges diverging past and current contributions to global environmental degradation. By doing so, this sentence creates the basis for addressing equity concerns in the context of environmental degradation. It also introduces the dichotomy that emerges from the stated commonality of responsibilities and an available basis for differentiation.

The third sentence concerns the remit that developed states' responsibilities bring about with respect to achieving sustainable development – i.e. supplying technology and financial resources.[136] It is important to note that the third sentence relates to the global situation of the early 1990s, while the second sentence does not allude to categories of states. Instead, it focuses on the varying contributions to global environmental degradation.[137] It thus allows the consideration of contributions beyond those that occurred before and at the time of the early 1990s.

In addition, Principle 7 has to be read in conjunction with Principle 6 that stresses the requirement of giving "special priority" to the "special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable." In addition, several other principles also refer to the interests of developing states in the context of sustainable development. Principle 9 concerns the cooperation on "endogenous capacity-building for sustainable development" and the transfer of technology. Principle 11 states that environmental standards and legislation should "reflect the environmental and developmental context to which they apply" and not be too burdensome for developing states.

Principle 12 emphasises that a "supportive and open international economic system" is conducive to "economic growth and sustainable development in all countries," enabling them "to better address the problems of environmental degradation." Trade policies should not use environmental concerns to disguise restrictions. International consensus should be the basis for measures to deal with transboundary or global environmental problems.[138]

The negotiation process of Principle 7 of the Rio Declaration, which formulates the CBDR principle, was cumbersome. The interpretation of the term "responsibility" in the formulation of the CBDR principle in Principle 7 was particularly contested. China and Pakistan, on behalf of the G-77

[136] Cullet, 2015, 234–5.
[137] French, 2000, 50.
[138] Cullet, 2015, 241.

and China grouping within the United Nations, proposed a formulation that strongly focused on the responsibility of developed states and demanded that developed states should make available financial resources and technology to ensure that developing states could pursue a sustainable development path. The proposal conceptualised a form of legal responsibility for environmental degradation of developed states that would result in an obligation to compensate the damage. A proposal made by the U.S. emphasised the partnership dimension of the CBDR principle.[139] Eventually, the U.S. issued an interpretive statement with respect to Principle 7, acknowledging the special leadership role of developed states as a result of their financial, institutional and technological capabilities. However, it "does not accept any interpretation of principle 7 that would imply a recognition or acceptance by the United States of any international obligations or liabilities, or any diminution of the responsibilities of developing countries under international law."[140]

The wording of the CBDR principle in Principle 7 that was adopted by all parties thus did not include any legal responsibility. This is important, mainly because the Rio Declaration establishes general principles for international environmental law and aims to enable the international community to work towards "international agreements which respect the interests of all and protect the integrity of the global environmental and developmental system."[141] One MEA, that was adopted as part of the Earth Summit, was the Biodiversity Convention.

B) Convention on Biological Diversity

The objective of the *1992 Convention on Biological Diversity* (CBD)[142] is the "conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources."[143] In fact, it is estimated that about 2,000

[139] Ibid., 233.
[140] The interpretative statement that the United States made was originally included in UN Doc. A/Conf.151/26 (Vol.IV) (1992), 20. The United States subsequently restated this interpretative statement in UN Doc. A/Conf.199/20 (2002), 26 August to 4 September 2002 (Report of the World Summit on Sustainable Development), at page 145. *See* also, French, 2000, 37; U.S. Department of State, "Digest of United States Practice in International Law 2002," https://2009-2017.state.gov/documents/organization/139638.pdf, p. 768 (World Summit on Sustainable Development – b. U.S. interpretation of summit declaration).
[141] Preamble of the Rio Declaration, para 5.
[142] The CBD is a framework convention that necessitates further protocols, pursuant to Article 28 CBD. The Cartagena Protocol entered into force on 11 September 2003. It governs the movements of living modified organisms. On 12 October 2014, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity entered into force. *See*, Convention on Biological Diversity, www.cbd.int.
[143] Article 1 CBD.

species disappear every year.[144] The CBD seeks to stop this fast loss of biodiversity as a result of environmental degradation.

Developing states are particularly affected by these dynamics for two reasons. First, most endangered and/or endemic species in diminishing habitats are found in developing states. In many parts of the world, socio-economic issues interact with the aim of conserving biodiversity. In 1995, a study identified 25 hotspots of biodiversity.[145] These hotspots point to "high-priority terrestrial ecoregions for conservation;" and they were mainly located in Southeast Asia, South Asia, Sub-Saharan Africa, Latin and Central America and the Caribbean.[146] During the 1990s, in all but one of the 25 biodiversity hotspots human population was growing (the Caucasus was the only exception); and in 19 of these hotspots, the population growth rate was even higher than the world average.[147] Population growth has been putting even more pressure on the habitats that had already lost most of its native vegetation. Hence, when considering measures to protect biodiversity in these areas it is of great importance to take into account demographic and socio-economic dynamics.

Second, many developing states rely on the export of commodities to generate revenues. The production of agricultural or mineral commodities has a similar impact on endangered species as trade in these species.[148] Since they are dependent on vital revenues, developing states degrade the habitats of endangered species and reduce biodiversity in order to satisfy demand for commodities in other parts of the world, primarily in developed states.[149]

Accordingly, the conservation of these habitats requires international cooperation. The implementation of an international instrument necessarily has to take into account the conditions in these developing states, with respect to their general social and economic situation, the structure of their economy, especially its main exports, and the capacity of these states to implement the measures that aim to protect global biodiversity.

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[144] Richerzhagen, Carmen, Jean Carlo Rodríguez, and Katharina Stepping, "Warum die internationale Entwicklungsfinanzierung für Biodiversität ausgeweitet und verbessert werden muss" [Why international developmental financing for biodiversity has to be expanded and improved], *Analysen und Stellungnahmen*, no. 15 (2016): 2.

[145] Cincotta, Richard P., Jennifer Wisnewski, and Robert Engelmann, "Human Population in the Biodiversity Hotspots," *Nature* 404 (2000):2000, 990.

[146] Ibid.

[147] In 1995, more than 1.1 billion people lived within these biodiversity hotspots. This was about 20% of the world population. The combined territory covered 12% of the Earth's terrestrial surface. The hotspots have been reviewed. Their number expanded to 36. *See* for the conceptualisation, Myers, Norman, "Threatened Biotas: 'Hot Spots' in Tropical Forests," *The Environmentalist* 8, no. 3 (1988): 187–208; Myers, Norman, Russell A. Mittermeier, Cristina G. Mittermeier, Gustavo A.B. da Fonseca, and Jennifer Kent, "Biodiversity Hotspots for Conservation Priorities," *Nature* 403 (2000): 853–8; *see* also, Critical Ecosystem Partnership Fund, "Biodiversity Hotspots Defined," www.cepf.net/our-work/biodiversity-hotspots/hotspots-defined.

[148] Lenzen, Manfred, Daniel D. Moran, Keiichiro Kanemoto, Barney Foran, Leonarda Lobefaro, and Arne Geschke, "International Trade Drives Biodiversity Threats in Developing Nations," *Nature* 486 (2012): 111.

[149] Ibid., 109.

The preamble of the CBD describes the conservation of biodiversity as a common concern of humankind[150] and states that "special provision" is required in order to meet the needs of developing states, with respect to financial resources and relevant technologies.[151] It also acknowledges that "economic and social development and poverty eradication are the first and overriding priorities of developing countries."[152]

This notion is reiterated in Article 20 (4) CBD. It points to the importance of providing support to developing states and emphasises that the implementation of the Convention by developing states depends on the extent to which developed states fulfil their commitments with respect to financial and technological support to developing states. The need for financial and technological support for developing states is mentioned in Article 8 (m) CBD with respect to in-situ conservation, while Article 16 (2) CBD calls for "concessional and preferential terms" when providing technology to developing states, including biotechnology.

These contextual norms clearly distinguish between developed and developing states parties. They take into account that many biodiversity hotspots are located in developing states and that assistance from developed states is essential to achieve the objective of the CBD.[153] Both the preamble and several articles of the CBD allude to the special socio-economic circumstances of developing states and the need to support them. However, they do not link the task of developed states parties to provide support to the responsibility of developed states for degrading global biodiversity. Rather, differential treatment is constructed as being based on the shared interest of preserving global biodiversity and the need to improve the capability of developing states in the course of implementing the Convention.

C) UN Convention to Combat Desertification

The *1994 United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa* (UNCCD) deals with human-induced degradation of soil and the subsequent desertification of large areas, especially in Africa.[154] The UNCCD links several vital environmental concerns with socio-economic developmental challenges

[150] Preamble of the CBD, para 3.
[151] Ibid., para 16.
[152] Ibid., para 19.
[153] Support from developed states remains the main source of financing for the implementation of biodiversity measures in developing states. *See*, Richerzhagen et al, 2016, 4.
[154] Article 1 CBD.

that particularly affect three vast drought-prone areas in Africa centred around the Kalahari Desert, Horn of Africa, and the Sahel.[155]

For limiting further desertification, both social and environmental aspects have to be considered. It is important to acknowledge that land practices in one area might cause desertification in another. Thus, the development of socio-economic systems and environmental change occur in a co-evolutionary way that can have positive or dysfunctional outcomes. To understand this correlation, local knowledge is essential.[156] Therefore, it is necessary that national frameworks create a legal and administrative context for dealing with desertification problems that includes and further develops local knowledge. The details of combating desertification must be decided at the local level.[157] Hence, international cooperation to address desertification primarily relates to action at the "intersection of environmental protection, economic development and social development."[158] The international community's support to local initiatives can be realised through financing, technology and knowledge transfer, and capacity building.

In order to facilitate cooperation to combat desertification, the UNCCD takes a broad and comprehensive approach to the problem, as it not only deals with desertification as a global environmental problem but also includes the task of poverty and hunger reduction.[159] This particularly reflects the needs of African states. In fact, African states played a key role in the drafting of the Convention, mainly because many states on the continent are severely affected by drought and desertification.[160]

The Convention includes four regional annexes that supplement it. The annexes form an integral part of the Convention pursuant to Article 29 UNCCD. The first one lists measures to improve the situation in Africa. It is more detailed and elaborated than the other three annexes and highlights in its Article 3 the special situation in Africa which has a high proportion of dry areas and frequently suffers from droughts. Droughts especially have an impact on landlocked, poor states where people rely on natural resources for subsistence.[161] Hence, Article 7 UNCCD requires the states parties to "give priority" to affected African states.

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[155] Ambalam, Kannan, "Challenges of Compliance with Multilateral Environmental Agreements: The Case of the United Nations Convention to Combat Desertification in Africa," *Journal of Sustainable Development Studies* 5, no. 2 (2014): 145, 159.
[156] Stafford Smith, Mark, and James F. Reynolds, "The Interactive Role of Human and Environmental Dimensions in the Desertification Debate," *Annals of Arid Zone* 42, nos. 3–4 (2003): 266.
[157] Ibid., 268.
[158] Bassett, Charles, and Joana Talafré, "Implementing the UNCCD: Towards a Recipe for Success," *Review of European Community and International Environmental Law* 12, no. 3 (2003): 133.
[159] Ambalam, 2014, 153, 157.
[160] Ibid., 157–9.
[161] Article 3 (a), (b), (c), (f) of Annex I to the UNCCD.

The preamble of the UNCCD also acknowledges the situation in Africa where drought and desertification have "particularly tragic consequences."[162] The preamble emphasises that numerous developing and least developed states suffer from drought and desertification. Yet, the UNCCD clarifies that "desertification and drought are problems of global dimension in that they affect all regions of the world and that joint action of the international community is needed." [163]

The dual focus on socio-economic and environmental issues is evident in the objective of the UNCCD. Article 2 (2) requires "long-term strategies" that not only include restoring and conserving vulnerable areas but also measures to improve living conditions and the productivity of the land. The affected states implement programmes to combat desertification and the effects of drought and cooperate "in a spirit of international solidarity and partnership." [164] Special needs and circumstances of affected developing states must be taken into "full consideration."[165]

Article 4 lists general obligations of all states parties, while Article 5 mentions the specific obligations of states parties that are affected by drought and/or desertification. These obligations create an environment that facilitates the cooperation to combat desertification, including national action programmes.[166] Furthermore, the parties are required to engage local populations in these efforts.[167] Pursuant to Article 6, developed states "actively support" affected developing states in combating desertification by providing substantial financial resources and facilitating access to "appropriate technology, knowledge and know-how."[168]

Finally, the UNCCD does not refer to any responsibility for the causation of desertification. Thus, it does not link any obligations to activities of "affected" states or those of neighbouring states that might be related to desertification in a nearby area following a change in land uses. Rather, as mentioned above, the preamble refers to a "global dimension" of desertification and drought and urges states to exploit their resources in a way that activities within their jurisdiction or control do not damage the environment of other states.[169] The Convention generally stresses the link between socio-economic changes and the effects on the environment and primarily facilitates the participation of "affected" developing states through contextual norms.

[162] Preamble of the UNCCD, para 5.
[163] Preamble of the UNCCD, para 4.
[164] Article 3 (c) UNCCD.
[165] Article 3 (d) UNCCD.
[166] Article 5 (b), (e) UNCCD.
[167] Article 5 (d) UNCCD.
[168] Article 6 (e) UNCCD.
[169] Preamble of the UNCCD, para 16.

D) Ozone regime

From the mid-1970s onwards, natural scientists observed that the accumulation of anthropogenic gases containing halogens, gases that dissolve from chemical substances with various industrial usages,[170] were thinning the ozone layer.[171] In the 1980s, the Antarctic ozone loss was also attributed to these chemicals. At that time, the production and use of these substances concentrated in developed states.

The depletion of the ozone layer and climate change are closely linked. Ozone depletion is linked to surface temperature rises in both polar regions and changing weather phenomena in the northern and southern hemispheres.[172] Furthermore, the loss of ozone in the stratosphere increases the values of UV radiation, which has serious consequences for the environment, especially the wellbeing of plants and animals. It can also be harmful to humans, causing skin cancer and eye damage.[173] Hence, chemicals that contribute to the depletion of the ozone layer have a profound effect on the global environment and human health.

The *1985 Vienna Convention for the Protection of the Ozone Layer* and the *1987 Montreal Protocol on Substances that Deplete the Ozone Layer* aimed to reverse the trend towards further depletion of the ozone layer.[174] The 1985 Vienna Convention states as its objective the protection of "human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer."[175] As a framework convention,[176] it enabled states parties to discuss the phenomenon of ozone loss at a moment when they had not yet reached a consensus about the science of the issue and the need to respond.[177] The Vienna Convention also facilitated cooperation on further research, monitoring of the phenomenon, and information exchange.[178] It also acknowledged the position of developing states. The preamble of the Convention called upon the states parties to take into account "the circumstances and particular

[170] Annexes A, B, C, E, and F of the Montreal Protocol list ozone-depleting substances.
[171] One of the first scientists who tried to understand the influence of human activity on the ozone layer was Paul J. Crutzen. *See*, Crutzen, Paul J., "The Influence of Nitrogen Oxides on the Atmospheric Ozone Content," *Quarterly Journal of the Royal Meteorological Society* 96, no. 408 (1970): 320–5; *see* also on the importance of the ozone layer and the threat that the emissions of certain gases pose to it, United Nations Environment Programme – Ozone Secretariat, "All about Ozone and the Ozone Layer," https://ozone.unep.org/ozone-and-you.
[172] McKenzie, Richard Lloyd, Pieter J. Aucamp, Alkiviadis F. Bais, Lars Olof Björn, Mohammad Ilyas, and Sasha Madronich, "Ozone Depletion and Climate Change: Impacts on UV Radiation," *Photochemical and Photobiological Sciences* 10, no. 2 (2011): 188.
[173] Ibid., 183.
[174] *See* also, United Nations Environment Programme – Ozone Secretariat, ozone.unep.org.
[175] Article 2(1) Vienna Convention.
[176] MEAs frequently use the structure of framework convention with subsequent protocols. The framework conventions generally establish the regime and entail procedural and institutional provisions. They also guide further negotiations about more substantive provisions that are included in protocols to the framework convention.
[177] DeSombre, Elizabeth R., "The Experience of the Montreal Protocol: Particularly Remarkable, and Remarkably Particular," *Journal of Environmental Law* 19, no. 1 (2000): 50.
[178] Ogden, Douglas Hunter, "The Montreal Protocol: Confronting the Threat to Earth's Ozone Layer," *Washington Law Review* 63, no. 4 (1988): 1002.

requirements of developing countries."[179] This notion is reiterated in Article 4 relating to the transfer of technology and knowledge.[180]

The 1987 Montreal Protocol regulates how ozone-depleting substances must be phased out. Detailed provisions concern the freeze and phaseout of these substances,[181] the control of trade with these substances,[182] the participation of developing states,[183] and periodical reassessments.[184]

Article 5 Montreal Protocol addresses the situation of developing states. States to which this article applies are developing and had a consumption of "controlled substances"[185] of less than 0.3 kilograms per capita when the Protocol entered into force. Article 10 establishes a mechanism for financial and technical cooperation, including the transfer of technology. Article 10A concerns the transfer of technology to developing states. Technologies to produce substitutes should be made available; and these substitutes should be environmentally safe. The transfer should be fair and under favourable conditions. Finally, developing states were initially granted a 10-year grace-period during which they could delay the implementation of measures to freeze and phase out ozone-depleting substances. This differentiated provision was subsequently applied differently to the various substances that were added to the Protocol following several amendments.[186]

Undoubtedly, the issue of responsibility is acknowledged by the categorisation of states in the Montreal Protocol. Given the pervasiveness of the substances and their broad usages, all industrialised and developed states produced materials that contained and would eventually emit ozone-depleting substances. These states were undeniably responsible for causing the problem in the first place. Their obligations were necessarily different from those of developing states with respect to the speed of the phaseout, financial obligations, and transfer of technology. However, developing states were also obliged to phase out the substances, albeit at a later date. They were allowed to consume these substances for their "basic domestic needs" and subsequently contribute to the phaseout.[187]

The Montreal Protocol is often praised for its success in impelling states to phase out environmentally dangerous substances. Indeed, industrial states quickly replaced these substances,

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[179] Preamble of the Vienna Convention, para 3.
[180] Article 4 (2) Vienna Convention.
[181] Articles 2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, and 2J Montreal Protocol.
[182] Articles 4, 4A, and 4B Montreal Protocol.
[183] Article 5 Montreal Protocol.
[184] Article 6 Montreal Protocol.
[185] *See* list of substances in Annex A of the Montreal Protocol.
[186] DeSombre, 2000, 70; *see* also phaseout arrangements for the various substances, Articles 2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, and 2J Montreal Protocol.
[187] Article 5 (1) Montreal Protocol.

mainly because industry was able to invent numerous substitutes. Yet, this important achievement is only part of the story that is also relevant in relation to the UN climate regime.

The entry into force of the Montreal Protocol 1989 coincided with the onset of the second decade of China's economic reform. During the 1990s, the Chinese industry witnessed an unprecedented increase in the production of ozone-depleting substances, mainly chloro-fluorocarbons (CFCs). Chinese production capacity was growing as fast as factories were closed down in developed states. Chinese producers of ozone-depleting substances started supplying their expanding domestic market and an emerging black market in developed states. By 1999, China had also emerged as the dominant global producer of ozone-depleting substances other than CFCs by taking "extravagant advantage" of the grace-period that the Montreal Protocol had granted to developing states.[188] In addition, in 2019 it was discovered that large production facilities in eastern China had caused an unexpected spike in CFC-11 emissions, which was first reported in 2018.[189] This substance had to be phased out in 2010. Its concentrations in the atmosphere had been dropping by 0.8% annually before 2012.[190] Hence, the implementation of the Montreal Protocol in China's large industry has been posing a tremendous challenge for decades.

History rhymes with respect to hydroflourocarbon 23 (HFC-23). This substance is one of the most potent greenhouse gases[191] and links the struggle against ozone depleting substances with efforts protect the climate. In 2013, natural scientists already warned of a huge increase in the concentrations of this substance. HFC-23 is a by-product of hydrochlorofluorocarbon 22 (HCFC-22), a refrigerant used in air conditioners. The 2016 Kigali Amendment to the Montreal Protocol seeks to regulate the phaseout of this greenhouse gas. Interestingly, in this case responsibility primarily lies with China. It is the largest historical producer of HCFCs, the largest producer of HFCs presently, and the largest producer of equipment that uses HCFC.[192] The fate of the Kigali Amendment, which governs substances at the intersection of ozone and climate concerns, depends on China's ability to implement the phaseout.

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[188] Pearce, Fred, "The China Syndrome," *New Scientist,* 15 May 1999, https://www.newscientist.com/article/mg16221866-000-the-china-syndrome/.

[189] A team of natural scientists – stationed in the U.S., Great Britain, and the Netherlands – noticed an increase in CFC-11 emissions since 2012, despite the fact that the reported production had been close to zero since 2006. They concluded that the increase was unrelated to past production. Thus, it concerned unreported new production that was undertaken in violation of the Montreal Protocol. *See*, Montzka, Stephen A. et al, "An Unexpected and Persistent Increase in Global Emissions of Ozone-depleting CFC-11," *Nature* 557 (2018): 413, 416.

[190] Tollefson, Jeff, "Rogue Emissions of Ozone-depleting Chemical Pinned to China," *Nature*, 22 May 2019, https://www.nature.com/articles/d41586-019-01647-z.

[191] HFC-23 is of limited direct use. Although HFC-23 can be easily removed, producers of HCFC-22 often chose to generate credits under the clean development mechanism (CDM) of the KP. The reliance on these "revenues" made it difficult to come to an international agreement. *See*, Zhang Junjie, and Wang Can, "China's Hydrofluorocarbon Challenge," *Nature Climate Change* 4 (2014): 944; *see* also on corrupt incentives for CDM projects, chapter six.

[192] Sun Xiaopu, and Tad Ferris, "The Kigali Amendment's and China's Critical Roles in Evolving the Montreal Protocol," *Natural Resources and Environment* 33, no. 2 (2018): 1.

As mentioned above, the ozone regime is a microcosm of the UN climate regime. Its differential and contextual provisions facilitate the participation of developing states. But all other states in this category pale into insignificance when compared with the amount of emissions resulting from economic activity in China. Thus, the task of upholding differential treatment, while trying to achieve the regime's objective, proved to be challenging. A reconsideration of the regime's approach, including adjustments to differentiated provisions, might become inevitable. The next subsection summarises how the CBDR principle was constructed following the development of international environmental law during the period in which the UNFCCC and the KP were drafted.

4.2.3.3. Constructing the CBDR principle

The preceding subsections provided an overview of differential treatment in MEAs and the emergences and codification of the CBDR principle during the 1992 Earth Summit. The purpose of examining (traces of) the CBDR principle in the three MEAs and the Rio Declaration was twofold. First, the overview sought to scrutinise the institutionalisation of differential treatment in the specific wording that the CBDR principle conveys. Second, it explored the operationalisation of differential treatment in the context of the emerging CBDR principle in international environmental law. Since the international environmental instruments that were discussed were contemporaneous with the UNFCCC and KP, they help to contextualise the inclusion of the CBDR principle in the UN climate regime.

The CBDR principle is a concept that combines the legacy of debates between developing and developed states that can be traced back to the Stockholm Conference on the Human Environment, the debate on the NIEO in the UN General Assembly, and the instrument of differential treatment in international environmental law. The CBDR principle thus alludes to various forms differential treatment in international environmental law. Compared with other instruments to institutionalise differential treatment, the CBDR principle in the UN climate regime emphasises the notion of responsibility. The previous subsection has shown that developed states generally do not accept any legal responsibility or liability for global environmental degradation. Instead, in a less controversial reading responsibility, as entailed in the CBDR principle, is understood to derive from past activities that have contributed to global environmental degradation. The states that benefited from degrading activities are encouraged to take a leading role in resolving present global environmental problems. In general, until and largely throughout the 1990s, the beneficiaries of such activities were developed states.

The examples that were discussed in the previous subsection illustrated that three facets shape the CBDR principle's interpretation. First, there is a *commonality* of responsibility among the states parties to cooperate in solving a global environmental problem. Second, given different contributions to the degradation of the environment states parties accept diverging obligations. By taking the lead in addressing the environmental problem at hand, developed states acknowledge their greater *responsibility*.[193] This notion needs to be understood in the context of the early 1990s, mainly because at that time the level of development correlated with the contribution to environmental degradation. In fact, the CBDR principle's emphasis is generally on the difference in contribution to global environmental degradation.[194] Third, in order to enable developing states to cooperate on global environmental affairs, MEAs utilise *differential treatment* – either as differentiated or contextual norms. Furthermore, under most MEAs financial support is funnelled through the Global Environment Facility or a specific arrangement,[195] which function as financial mechanisms where donor and recipient states participate equally.[196] By doing so, the CBDR principle changes institutional and decision-making patterns in favour of developing states parties in the particular realm of providing financial support to developing states.[197]

The three facets of commonality, different responsibilities, and differentiated obligations correspond with the concepts of common concern of humankind, equity, and substantive equality,[198] as discussed above.[199] The facet of commonality makes clear that all states parties have obligations, but it also ensures that all states can participate. Indeed, regimes that address a common concern of humankind seek to achieve an equitable sharing of the burdens that the solution of the problem entails, while the differentiation of obligations, derived from different responsibilities, warrants that the regime in question is politically acceptable.[200]

The CBDR principle mainly plays a facilitative role. Principle 7 of the 1992 Rio Declaration introduced the wording of the CBDR principle to international environmental law. As a principle of this field of international law, it is primarily intended for contributing to the establishment of

[193] Principle 7 Rio Declaration.
[194] *See* on emphasising the contribution to environmental degradation versus different levels of development, International Law Association, 1994, 116.
[195] *See* for a specific arrangement the Multilateral Fund under the Montreal Protocol pursuant to Article 10 Montreal Protocol.
[196] Hey, "Common but Differentiated Responsibilities," 2011, paras 8, 9.
[197] *See* subsection 4.2.3.1.
[198] *See*, Brown Weiss, Edith, "Common but Differentiated Responsibilities in Perspective," *ASIL Proceedings* 96 (2002): 366; *see* on substantive equality, Cullet, 1999, 553–7; Cullet, 2003, 30; Cullet, 2010, 166; Kellersmann, 2000, 39.
[199] *See*, subsection 4.2.3.1.
[200] French, 2000, 366; *see* also, Sands, Philippe, "International Law in the Field of Sustainable Development," *British Yearbook of International Law* 65, no. 1 (1994): 344; Brunnée, Jutta, "Common Areas, Common Hertiage, and Common Concern," in *Oxford Handbook of International Environmental Law*, ed. Daniel Bodansky, Jutta Brunnée, and Ellen Hey (Oxford: Oxford University Press, 2007), 566.

"international agreements which respect the interests of all and protect the integrity of the global environmental and development system." [201]

The CBDR principle's operationalisation is reflected during several stages of an MEA's existence – i.e. negotiations of MEAs, their implementation, and further development. Yet, during these stages the CBDR principle facilitates international environmental cooperation differently. Ellen Hey explains that during the *negotiation* phase the CBDR principle enables developing states to claim that their socio-economic position has to be taken into account when treaty provisions are being formulated. By doing so, the CBDR principle has profoundly affected international environmental law, mainly because it changed the discourse as more arguments were accepted as valid. The broadening of the discourse is essential, as the response to global environmental problems entails far-reaching social and economic adjustments.[202]

After the negotiation phase, differentiated provisions guide the *implementation* of MEAs. In this phase, the principle is operationalised when developed and developing states fulfil their different commitments, deploying the instrument of differential treatment. The discussion of the MEAs in the previous subsection provided numerous examples.

Grasping the CBDR principle's role in the further development of an MEA is the most challenging task.[203] When assessing the principle's role in this phase, it is particularly important to keep in mind that the CBDR principle does not constitute a norm.[204] Only norms can establish and uphold regimes. Principles "merely" inform the creation of norms.[205] Therefore, the interpretation of the CBDR principle itself with respect to the further evolution of an environmental regime is ambiguous and malleable.

During the *maturing* phase of a regime, the way in which the principle facilitates states parties' actions depends on the context of the regime. Inspiring and guiding further negotiations constitutes the principle's primary use in this phase, based on the regime's legacy and changing circumstances.

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[201] *See* second sentence of Principle 7 Rio Declaration.

[202] Hey, "Common but Differentiated Responsibilities," 2011, para 19.

[203] The nature of this phase is closely related to the institutional set-up of MEAs. Most regimes follow the framework convention-protocol paradigm. In this paradigm, the substantive provisions in the convention are general with respect to the obligation of states and often limited to procedural issues. The commitment of the states parties are further specified in a protocol that subsequently is implemented by the parties. The maturing phase thus starts with the reconsideration of the first experiences with the implementation of these provisions.

[204] Ellen Hey stresses that the CBDR principle has normative implications, as it implies commitments of developed states vis-à-vis developing states. Since the principle cannot be applied in a precise, unmistakable way, it "is unlikely to qualify as a rule." Christopher Stone describes the CBDR principle as a "normative principle." *See*, Hey, "Common but Differentiated Responsibilities," 2011, para 18; Stone, Christopher D. Stone. "Common but Differentiated Responsibilities in International Law." *American Journal of International Law* 98, no. 2 (2004): 290.

[205] *See* the distinction between principles and norms that Frieder Roessler put forward. He points to the fact that usually principles reflect an incomplete consensus. The desirability of a goal was agreed among negotiators, but there was no agreement on the instruments to achieve the goal. Generally, the concreteness of the agreement not only entails the negotiators' goal but also the relative position of their goal among other goals. A principle thus represents an agreement on a value, while a rule constitutes an agreement on a hierarchy of values. Roessler, 1977, 56–9.

Thus, at such a juncture the states parties have to reassess the basis for differentiation and then determine the further operationalisation of the principle considering the states parties' contribution to the degradation problem and their evolving capabilities. Hence, the issue that remains to be examined is how the operationalisation of the CBDR principle continues to be reflected in a maturing MEA. This issue is vital for understanding the UN climate regime's evolution. The next section discusses the operationalisation of the CBDR principle in the UNFCCC and KP, covering the first two phases of the regime's development – i.e. its establishment and the first round of implementing commitments.

4.3. The CBDR principle in the UN climate regime

After the overview of how differential treatment in international environmental law developed, this section assesses how the CBDR principle helps to consider needs of developing states in the context of mitigating climate change. The first subsection summarises the operationalisation of the CBDR principle in the UNFCCC and KP. Then, the second subsection reviews the legal scholarly discourse on the role of the CBDR principle under these two legal instruments. This section highlights the CBDR principle as a core aspect of the UN climate regime that in its initial operationalisation stressed distributive issues in lieu of the environmental concerns.

4.3.1. The CBDR principle in the UNFCCC, Berlin Mandate, and Kyoto Protocol

The UNFCCC initially mentions the CBDR in the sixth paragraph of its preamble. This paragraph acknowledges that climate change is a global phenomenon. Addressing the problem requires "the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions."[206]

Paragraph three of the preamble considers the responsibility for the climate change problem and notes that "the largest share of historical and current global emissions of greenhouse gases has originated in developed countries." It proceeds to delineate the notion of responsibility by pointing to the "still relatively low" level of per capita emissions in developing states.[207] Thus, the preamble of the UNFCCC sets the context for the differentiation of state parties' commitments – i.e. responsibility

[206] Preamble of the UNFCCC, para 6.
[207] Ibid., para 3.

for past emissions and low per capita emissions. Finally, the preamble asserts that developed states will have to take "immediate action,"[208] while it anticipates that developing states' energy consumption will grow. Yet, this is relativised by the expectation that these states take into account "the possibilities for achieving greater energy efficiency and for controlling greenhouse gas emissions in general."[209]

The inclusion of principles in the operative part of the Convention, as shown below, is exceptional, as Rudolf Dolzer notes, mainly because international treaties usually only include principles in the preamble or even omit the principles on which they are based. Still, developing states demanded that principles that govern the Convention had to be mentioned at this unusual place. By doing so, the principles would also be part of future protocols.[210] Pursuant to Article 31 (2) of the Vienna Convention on the Law of Treaties,[211] the preamble is part of the "context for the purpose of the interpretation of a treaty."[212]

Nevertheless, the wording of the CBDR principle in the preamble points to a compromise between developed and developing states.[213] Prior to the adoption of the Convention, developing states had ascribed the main responsibility for the degradation of the global environment to the developed world.[214] The preamble does not include this wording; neither does it allude to the notion that developed states have to take the lead in combating climate change, as stated in the operative text of the Convention.[215]

Two articles in the text of the Convention reiterate the formulation of the CBDR principle – i.e. Articles 3 (1) and 4 (1) UNFCCC:

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[208] Ibid., para 18.
[209] Ibid., para 22.
[210] Dolzer, Rudolf, "Die internationale Konvention zum Schutz des Klimas und das allgemeine Völkerrecht" [The international convention for the protection of the climate and international law], in *Recht zwischen Umbruch und Bewahrung: Völkerrecht, Europarecht, Staatsrecht* [Law in-between transformation and preservation: International law, European law, constitutional law], ed. Ulrich Beyerlin, Micheal Bothe, Rainer Hoffmann, and Ernst-Ulrich Petersmann (Berlin: Springer, 1995), 959; Kellersmann, 2000, 144–5.
[211] Bodansky et al, 2017, 127–8.
[212] Vienna Convention on the Law of Treaties, 23 May 1969, 1155 UNTS 331, UN Doc. A/CONF.39/27, 8 ILM 679 (1969), 63 AJIL 875 (1969).
[213] Bodansky et al, 2017, 127–8.
[214] *See*, for instance, the second sentence of paragraph 7 of the 1991 Beijing Declaration: "发达国家对全球环境的退化负责主要责任。" [Developed states are primarily responsible for the degradation of the global environment.]; see also paragraph 8 of the preamble of UN GA Res. 45/212: "…the largest part of the current emission of pollutants into the environment originates in developed countries, and recognizing therefore that those countries have the main responsibility for combating such pollution."
[215] *See*, Article 3 (1) UNFCCC.

Article 3

PRINCIPLES

In their actions to achieve the objective of the Convention and to implement its provisions, the Parties shall be guided, inter alia, by the following:

1. The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

Article 4

COMMITMENTS

1. All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

…

Since it is included in Article 3, the CBDR principle guides the actions that states parties take under the Convention – procedurally, institutionally, and substantively – in order to achieve its objective – i.e. "stabilisation of the greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[216] Moreover, the CBDR principle specifically applies to the fulfilment of the states parties' commitments, because it is stated in the first sentence of Article 4 UNFCCC.

In contrast with the negotiations of the 1985 Vienna Convention for the Protection of the Ozone Layer, developing states participated in the climate change negotiations from the beginning.[217] The participating states were clearly divided with respect to the design of emissions reduction obligations. The representatives of the EU wanted to include quantitative commitments in

[216] Article 2 UNFCCC.
[217] Kellersmann, 2000, 139–40.

the Convention. The U.S. sought to avoid rigid obligations, while the G-77 and China grouping was against any commitments for developing states, including voluntary commitments for individual developing states.[218]

Consequently, the commitments are cautiously formulated and contextualised by the CBDR principle. Pursuant to Article 4 UNFCCC, all states parties, "taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstance," have to set up national mechanisms to monitor greenhouse gas emissions [219] and "formulate, implement, publish and regularly update" national or regional programmes to mitigate climate change "by addressing anthropogenic emissions by sources." [220]

Article 4 (2) UNFCCC includes binding commitments for "developed" states and "other" states that were undergoing a transition process to a market economy. These states are listed in Annex I. These states have to adopt national mitigation policies and corresponding measures. By doing so, these states parties "demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions." Nevertheless, this paragraph takes into account "differences in the Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances."[221]

Article 4 (7) UNFCCC reiterates this notion by the contextualising the duty of developing states to implement their commitments. Thus, the extent to which they will effectively implement their commitments under the Convention "will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology." Furthermore, in this context it will be fully taken into account that "economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties."[222]

Article 4 (3) UNFCCC includes a binding obligation for Annex II states[223] to provide "new and additional financial resources" to developing states so that they can meet their commitments under paragraph 1 of this Article. Furthermore, Article 4 (4) obliges developed states listed in Annex II to assist developing states parties "that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects."

[218] Ibid., 141; Tangen et al, 2001, 240.
[219] Article 4 (1) (a) UNFCCC.
[220] Article 4 (1) (b) UNFCCC.
[221] Article 4 (2) (a) UNFCCC.
[222] Article 4 (7) UNFCCC.
[223] Annex II of the UNFCCC includes all developed states.

The basis of the categorisation in the annexes was the membership in the Organisation for Economic Co-operation and Development (OECD) in 1992.[224] Thus, Annex I included states that were OECD members in 1992 and former socialist states that were enacting market reforms. Annex II only listed OECD members. Non-Annex I parties were generally considered as developing states. Not much thought was given to the categorisation, while even some anomalies or inconsistencies were accepted.[225] At that time, it was expected that the annexes could be revised,[226] following the procedure described in Article 15 UNFCCC. Yet, subsequently non-Annex I parties resisted adding states to Annex I, even if their economies had expanded to a degree that they could no longer be reasonably categorised as developing states.[227] Some states, such as Chile, the Czech Republic, Estonia, Hungary, Israel, the Republic of Korea, Latvia, Lithuania, Mexico, Poland, the Slovak Republic, and Slovenia, became members of the OECD after the adoption of the UNFCCC and KP.[228]

The 1995 Berlin Mandate was the first decision that the parties took under the newly established UN climate regime. The regime's first conference of the parties (COP) had great influence on the operationalisation of the CBDR principle with respect to the mitigation of climate change. The states parties reviewed the adequacy of Article 4 (2) UNFCCC and decided to strengthen the commitments under the Convention. They adopted the Berlin Mandate in order to start negotiations about a "protocol or another legal instrument."[229]

Paragraph 1 of the Berlin Mandate states that this process should be guided by the CBDR principle as formulated in Article 3 (1) UNFCCC.[230] Most importantly, paragraph 2 (b) precluded the introduction of "any new commitments for Parties not included in Annex I" (developing states and states whose economies were transitioning to market economies) under the new legal instrument.[231] The Berlin Mandate is one of the COP decisions under the UN climate regime that established "frameworks and attendant boundaries" from which the parties would seldom diverge.[232] Accordingly, the negotiations of the protocol, which took place during the succeeding two years determined specific emissions reduction targets, followed the prescription of the Berlin Mandate.

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[224] *Cf*. the dates of membership of all OECD states, OECD, "Our Global Reach," https://www.oecd.org/about/members-and-partners/.
[225] Israel and South Africa were not listed as Annex I states, while Turkey, as an OECD member, was included in both Annex I and II. *See*, Bodansky et al, 2017, 122.
[226] Article 16 UNFCCC.
[227] Bodansky et al, 2017, 123.
[228] OECD, "Member Countries," https://www.oecd.org/about/members-and-partners/.
[229] The Berlin Mandate: Review of the Adequacy of Article 4, paragraph 2 (a) and (b), of the Convention, Including Proposals Related to a Protocol and Decisions on Follow-up, Decision 1/CP.1 (FCCC/CP/1995/7/Add.1), 6 June 1995.
[230] Ibid., para 1.
[231] Ibid., para 2 (b).
[232] Bodansky et al, 2017, 20.

Eventually, the negotiation process led to the adoption of the KP during COP-3 in 1997. The CBDR principle defines the entire structure of the KP[233] in the sense that, as prescribed in the Berlin Mandate, only Annex I parties (developed states) have specific quantified emissions reduction obligations.[234] Article 10 KP lists the commitments that all states parties have under the Protocol. Yet, before these commitments are specified Article 10 (1) KP restates the CBDR principle and the notion that this article does not introduce "any new commitments for Parties not included in Annex I." Thus, under the KP developing states had no binding obligations to limit or reduce their greenhouse gas emissions.

This approach to differentiation became increasingly controversial.[235] In fact, the way in which the CBDR principle was operationalised in the KP was considered as "radical differentiation"[236] and the clearest attempt to transform the CBDR principle "from a legal concept into a policy instrument."[237] Indeed, both the UNFCCC and KP express the CBDR principle in a "remarkable" way.[238] Not only do they express the principle in their Articles 3 UNFCCC and 10 KP, they also reflect the principle in several substantive provisions. Indeed, a number of provisions of the UNFCCC consider the situation of specific groups of states parties, such as Article 4 (6) states with economies in transition, Article 4 (9) least developed states, Article 4 (8) developing states that are vulnerable to climate change, and Article 4 (10) fossil-fuel producing developing states that are vulnerable to the effects of climate measures.[239]

To sum up, compared to other contemporaneous international environmental instruments the operationalisation of the CBDR principle in the UNFCCC and KP clearly reached "a hitherto climax."[240] The next subsections discuss how the differentiation under the UN climate regime was received by the EU, U.S., and China and how it was analysed by international legal scholars.

4.3.2. Appreciation of the CBDR principle among main actors

The negotiations that led to the adoption of the UNFCCC and KP were cumbersome. The negotiations about the UNFCCC took place in a situation of great uncertainty about the consequences of climate change and the assessment of the scientific evidence. Furthermore, most people could not yet

[233] Kellersmann, 2000, 148.
[234] The KP is mainly addressed to "Parties included in Annex I" (1992 OECD members and economies in transition). *See* on emission limitation and reduction commitments, in Articles 2 (1) and 3 (1) KP, respectively.
[235] Bodansky et al, 2017, 166.
[236] Ibid., 165.
[237] Joyner, Christopher C., "Common but Differentiated Responsibility," *American Society of International Law Proceedings* 96 (2002): 358.
[238] Kellersmann, 2000, 200.
[239] *See* also, Bodansky et al, 2017, 121.
[240] Kellersmann, 2000, 204.

imagine a pathway to solving the problem. From the outset, developed states argued among themselves and with developing states about proper obligations and the incorporation of divergent responsibilities to mitigate climate change. Developing states were also divided about the level of participation in the regime that could be expected from them. Eventually, the operationalisation of the CBDR principle – especially in the KP – shaped the perception of the regime among many states parties; and they subsequently interacted with the parameters that the regime set and determined their positions and identities in the context of this regime.

The negotiations of the UNFCCC took place against the backdrop of the preparations for the 1992 Earth Summit. The establishment of the UN climate regime must also be understood with the negotiations of the 1992 Rio Declaration in mind. As already mentioned,[241] although many commentators focus on the interaction between the EU and the U.S. in the initial stages of the climate negotiations, China's influence on the course of the negotiations must not be underestimated.[242]

During this period, China acted in concert with the G-77 and China grouping on international environmental issues. However, it retained its individual position by often reiterating its own point of view on certain matters in addition to G-77 and China statements.[243] Furthermore, over the years it increasingly stressed its role as an important state within the developing world. China's leadership was hesitant about cooperation based on international regimes, mainly because it feared policies or mechanisms that might impact national sovereignty or interfere with the country's internal governance.[244] From the outset, Chinese delegations to international environmental conferences were well prepared. In addition, the leadership began to enact domestic environmental policies following the Stockholm Conference and, subsequently, took the initiative at the international level in order to strengthen its position.

During the climate change negotiations, the Chinese leadership's main goal was to avoid any binding commitments with respect to the reduction of emissions. Prior to the adoption of the UNFCCC and during the negotiations of the legal instrument that would become the KP, China refused to discuss the issue of how and when developing states should accept quantitative emissions reduction obligations that would go beyond the general commitment of Article 4 (1) UNFCCC. It also

[241] *See*, section 4.2.
[242] *See* on China's role, subsection 4.2.1.
[243] Tangen et al, 2001, 238.
[244] Heggelund, Gørild, and Ellen Bruzelius Backer, "China and UN Environmental Policy: Institutional Growth, Learning and Implmentation," *International Environmental Agreements* 7, no. 4 (2007): 420.

rejected the possibility of enabling voluntary commitments for developing states.[245] During the negotiations of the KP specifically, China continued to vehemently oppose the inclusion of any binding commitments for developing states and urged developed states parties to take the lead.[246] Throughout the negotiations, China based its stance on the application of the CBDR principle. China's utilisation of the principle to voice its concerns can be best described by the concept of "rhetorical action"[247] – a strategic use of norm-based arguments to pursue other unrelated interests. The fact that the Chinese negotiators were able to rely on the CBDR principle to adopt a categorical no-binding-commitment attitude highlights the hybrid nature of the principle in the UN climate regime at this stage of its development.[248]

China's vision of the principle was twofold. First, China's support for the principle was related to the leadership's economic policy objectives. Second, China also understood the differentiation that the application of the principle entailed as a means to promote equity in international affairs.[249] In the political context of Chinese policymaking, this line of thought linked economic growth and social progress with the legitimacy of the Communist Party. During the negotiation phase of the UN climate regime in 1990s, the imagination of the CBDR principle as a vehicle to preserve economic growth was essential from the viewpoint of the Chinese leadership.[250]

However, China's actions also stem from the fact that it felt not fully accepted in the international community. At least, it did not see itself as a full member. Stuart Harris explains this positioning with the nature of the international community as being based on mutual acceptance and shared values.[251] A certain apprehension among Chinese leaders concerning shared values in the international system cannot be denied. To explain this situation, Samuel S. Kim refers to the "shadow of the past – China's perennial concern with its status, security and sovereignty."[252] This clearly influences China's attitude to international negotiations, normative developments, and

[245]Tangen et al, 2001, 239.

[246]China was also reluctant to accept the flexibility mechanisms of the KP, especially the instruments of joint implementation and the clean development mechanism, as it feared that developed states could use these instruments to avoid reducing emissions in their own economies. *See*, Tangen et al, 2001, 242.

[247] *See* for the concept of rhetorical action, Schimmelfennig, Frank, "The Community Trap: Liberal Norms, Rhetorical Action, and the Eastern Enlargement of the European Union," *International Organization* 55, no. 1 (2001): 47–80.

[248] Economic concerns defined China's negotiation position. Accepting any obligations would have been a sign of weakness at the international level; *see* for more detail on the international context of the climate negotiations in subsection 4.4.2.

[249]The issue of promoting fairness is generally reflected in the Chinese discourse on the CBDR principle. Stalley, Phillip, "Principled Strategy: The Role of Equity Norms in China's Climate Change Diplomacy," *Global Environmental Politics* 13, no. 1 (2013): 3–5.

[250]From 1949 onwards, three decades of ill-designed agricultural and industrial policies resulted in about 40 million deaths during a famine between 1958 and 1961 and contributed to an economic crisis during the 1970s that almost led to national bankruptcy. Economic reforms began in 1979, in a climate of political struggle. After protests against increasing socio-economic imbalances and the restriction of political expression were ended violently in 1989, the leadership of the Communist Party solely relied on fast economic growth to uphold its grip on the country.

[251]Harris, Stuart, *China's Foreign Policy*. Cambridge: Polity Press, 2014, 189.

[252]Kim, Samuel S., "The Development of International Law in Post-Mao China: Change and Continuity," *Journal of Chinese Law* 1, no. 2 (1987): 157.

commitments in international regimes. In addition, the Chinese leadership generally conceives international law as an instrument that potentially can enhance foreign policy goals and objectives.[253] Chinese leaders do not recognise the intrinsic value of a rule-based society neither in the domestic nor international context.[254] During the 1990s, China's positioning could hardly nurture a notion of solidarity and partnership at the international level. China's promotion of a radical differentiation in the KP based on the CBDR principle translated domestic economic concerns to the global level in an all-out effort.

The experience of negotiating the UNFCCC and KP shaped the positions of the EU and U.S. Initially, the U.S. had been the foremost promoter of global efforts to mitigate climate change. Yet, following the adoption of the UNFCCC it began to lose this leadership position to the EU. This was the result of domestic political shifts and the phenomenon of climate change denial as well as the politicisation of the topic. But is also related to the further evolution of the regime itself.[255]

Daniel Bodansky reports that the U.S. was particularly opposed to the inclusion of the principles article in the UNFCCC (Article 3). The principles that this article includes, such as the CBDR principle, could be better part of the preamble.[256] As already discussed, developing states succeeded in retaining the principles article. The U.S. subsequently asked for changes to Article 3 UNFCCC in order to reduce its potential legal implications. These changes include the chapeau, which clarified that the principles listed in this article should "guide" the parties in "their actions to achieve the objective of the Convention and to implement its provisions."[257] These changes thus narrowed the scope of the principles and contextualised them to the climate change setting, which should prevent any attempt to present the principles as part of customary international law. The principles only apply to the states parties in relation to the Convention. Finally, the U.S. tried to make sure that a state party could not be found in breach of Article 3 in the context of following the dispute settlement

[253] Kim, 1987, 158.

[254] The instrumental perception of law can even be illustrated by examining common language use. The recent domestic discourse on a rule-of-law mode of governance in mainland China uses the expression 依法治国 [*yi fa zhi guo*]. This can be translated as "relying on the law to rule the state/country." On the island of Taiwan, however, which is governed independently from the regime in Beijing and has transitioned to a constitutional democracy in the decades after 1949, the expression 法治國家 [*fa zhi guojia*] is used which is equivalent to the term "constitutional state" (*état de droit*, *Rechtsstaat*) in the European context. *See* for President Xi Jinping's concept of "relying on the law to rule the country," "全面依法治国，开启中国法治新时代: 学习《习近平关于全面依法治国论述摘编》" [Thoroughly relying on the law to rule the country, inaugurating a new era in the legal history of China: Study 'Excerpts from Xi JinpIng's discourse on thoroughly relying on the law to rule the country], 4 May 2015, http://politics.people.com.cn/n/2015/0505/c1001-26947558.html; *see* for an appreciation of the approach to international law by Chinese legal scholars and practitioners, Roberts, Anthea, *Is International Law International?* Oxford: Oxford University Press, 2017; Cai Congyan, *The Rise of China and International Law: Taking Chinese Exceptionalism Seriously*. Oxford: Oxford University Press, 2019.

[255] *See* for a detailed account, Carlarne, Cinnamon Piñon, *Climate Change Law: EU and US Approaches*. Oxford: Oxford University Press, 2010, 21–140.

[256] The inclusion of the principles in this part of the UNFCCC was considered confusing. *See*, Bodansky, 1993, 501.

[257] Article 3 UNFCCC.

mechanism in Article 14 UNFCCC.[258] Nevertheless, the U.S. government supported the CBDR principle consistently after the adoption of the UNFCCC.[259]

The EU has also been a supporter of differentiated provisions. In fact, the EU has done more than any other party to promote the UN climate regime and a form of burden sharing that is necessary to implement it.[260] The EU has generally been in favour of the inclusion of the CBDR principle in the UN climate regime. It even accepted the operationalisation of the principle in the KP and was willing to continue the Kyoto process after the U.S. had withdrawn. The EU constantly sought to lead by example, which included an early adoption of climate measures.[261] This is particularly true for innovative instruments of climate governance and an equitable way of internal burden sharing.[262]

Jutta Brunnée concludes that the EU deliberately sought to position itself in favour of a multilateral approach and binding reduction obligations. The EU sought to use the climate change issue to evolve as a normative power in international affairs.[263] In this regard, the centrality of the UN climate regime in international efforts to mitigate climate change was important. Moreover, the EU and its member states supported the principles on which the UNFCCC was based, mainly because these principles were either contained in EU law or resonated with EU practice, especially the operationalisation of the CBDR principle.[264] Accordingly, from the outset the EU has been aligning its own climate policy with the principles of the UNFCCC. Countless policy statements and the Union's position in international climate negotiations acknowledge the vulnerable position of developing states and the need to support these states with financial and technological assistance. Hence, the EU did not seek to prevent the application of the CBDR principle to the climate change issue; and since the adoption of the UNFCCC the EU has actively been involved in the debate that seeks to define how equity concerns that are included in the CBDR principle can effectively be realised through international climate cooperation.[265]

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[258] Bodansky, 1993, 502.
[259] Harris, Paul G., "Common but Differentiated Responsibility: The Kyoto Protocol and United States Policy," *New York University Environmental Law Journal* 7, no. 1 (1999): 35–6.
[260] Harris, Paul, G., "The European Union and Environmental Change: Sharing the Burdens of Global Warming," *Colorado Journal of International Environmental Law and Policy* 17, no. 2 (2006): 312.
[261] *See* in detail, chapter five.
[262] *See*, Schreurs, Miranda, and Yves Tiberghien, "Multi-Level Reinforcement: Explaining European Union Leadership in Climate Change Mitigation," *Global Environmental Politics* 7, no. 4 (2007): 19–46; Jordan, Andrew et al, "Understanding the Paradoxes of Multilevel Governing: Climate Change Policy in the European Union," *Global Environmental Politics* 12, no. 2 (2012): 43–66.
[263] Brunnée, 2008, 30.
[264] Ibid., 33–5.
[265] Ibid., 40.

4.3.3. International legal discourse

Following the adoption of the KP in 1997, the operationalisation of the CBDR principle in the UN climate regime attracted much attention from international legal scholars, resulting in an impressive body of international legal literature.[266] The backdrop of most evaluations is the developing-developed states dichotomy that is reflected in the operationalisation of the principle. Lavanya Rajamani describes the CBDR principle as "a contentious, but nonetheless central element of the conceptual apparatus of the climate regime."[267]

Generally, a clear distinction can be made between assessments of the CBDR principle's operationalisation in the UNFCCC and those that consider the KP's approach. No doubt, the operationalisation of the principle in the UNFCCC reflects "a clear balance of commitments" that oblige developing states to pursue a sustainable development and adapt their societies to climate change, while developed states take steps to mitigate climate change.[268]

With the adoption of the KP, assessing the role of the CBDR principle became more complex. As a substantive supplement to the UNFCCC, the KP emerged as the "regulatory backbone" of the UN climate regime.[269] However, the KP not only included obligations for developed states with far-reaching consequences for their domestic economic policies but also led to much discontent with its approach to differentiation.

The focus of the scholarly discourse on the CBDR principle in the UN climate regime shifted to the principle's operationalisation in the Protocol. Several issues shaped the debate. The interpretation of the CBDR principle by some important actors diverged considerably, in particular a group of developed states led by the U.S. (the JUSCANZ)[270] and the G-77 and China grouping. A stalemate emerged after the adoption of the KP.[271] Concerns about the UN climate regime's further development saw the direction of the debate oscillating between the regime's structure and the role

[266] *See*, in particular, Brunnée and Toope, 2010, 126–219; Honkonen, Tuula, "The Principle of Common but Differentiated Responsibility in Post-2012 Climate Negotiations," *RECIEL* 18, no. 3 (2009): 257–67; Kellersmann, 2000, 135–204; Rajamani, 2006; 176–250.
[267] Rajamani, Lavanya, "From Berlin to Bali and beyond: Killing Kyoto Softly?," *International and Comparative Law Quarterly* 57, no. 4 (2008): 923.
[268] Rajamani, Lavanya, "The Principle of Common but Differentiated Responsibility and the Balance of Commitments under the Climate Regime," *RECIEL* 9, no. 2 (2000): 125.
[269] Carlarne, 2010, 9.
[270] The group included Japan, the U.S., Canada, Australia, Norway, and New Zealand; and was sometimes joined by other developed states that are not members of the EU. This group demanded a meaningful participation of key developing states. Possible contributions could be voluntarily assumed binding emissions targets. The G-8 meeting in 1998 also suggested that developing states could voluntarily adopt legally binding targets. Developing states, however, rejected the notion of "meaningful participation" of developing states and equated this expression with a refusal by developed states of the leadership role in reducing emissions. *See*, Rajamani, 2000, 127–8.
[271] *See* in more detail, subsection 4.4.2.

of the CBDR principle.[272] Scholarly contributions began to propose structural adjustments to the UN climate regime in order to both end the stalemate and ensure meaningful differentiation.[273]

Rajamani praises the UN climate regime's unique burden-sharing arrangement through differential treatment, which facilitates the participation of developing states. Still, she points to a range of differences between states that the UN climate regime insufficiently acknowledges. These relate to the socio-economic situation of the participating states, the nature and degree of their contribution to climate change, and states' vulnerability to the consequences of climate change. She concludes that the categorisation of states based on membership in coalitions – the G-77 and China grouping and OECD states – might eventually not suffice for the differentiation needed under the UN climate regime.[274] Therefore, she suggests that considering differentiation within the developing states category would become necessary, relying on capacities and contributions. States that are capable of accepting commitments would need to actively play a part in solving the climate change problem.[275]

Jutta Brunnée and Charlotte Streck continue this line of thought and suggest a solution to the operationalisation of the CBDR principle and the issue of differentiation within the group of developing states by putting more emphasis on their "respective capabilities" that take into account changing national circumstances.[276] They stress that the collective action, which states parties undertake, cannot merely consider equity but must also have regard for the objective of the Convention.[277]

Michael Weisslitz also concludes that the operationalisation of the CBDR principle in the KP shows that economic concerns – maintaining economic growth in developing states – have been placed ahead of environmental considerations. By doing so, the international community does not recognise the severity of climate change.[278] From an environmental perspective this approach seems

[272] Werksman, Jake, "Legal Symmetry and Legal Differentiation under a Future Deal on Climate," *Climate Policy* 10, no. 6 (2010): 672.
[273] *See*, for example, Bodansky, Daniel, and Elliot Diringer, "The Evolution of Multilateral Regimes: Implications for Climate Change," December 2010, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1773828, pp. 14–8; Hamdi-Cherif, Meriem, Céline Guivarch, Philippe Quirion, "Sectoral Targets for Developing Countries: Combining 'Common but Differentiated Responsibilities' with 'Meaningful Participation,'" *Climate Policy* 11, no. 1 (2011): 731–51.
[274] Rajamani, Lavanya, "The Nature, Promise, and Limits of Differential Treatment in the Climate Regime," *Yearbook of International Environmental Law* 16, no. 1 (2005): 89, 112.
[275] Ibid., 116–7.
[276] Brunnée, Jutta, and Charlotte Streck, "The UNFCCC as a Negotiation Forum: Towards Common but More Differentiated Responsibilities," *Climate Policy* 13, no. 5 (2013): 589.
[277] Ibid., 2013, 603.
[278] Weisslitz, Michael, "Rethinking the Equitable Principle of Common but Differentiated Responsibility: Differential versus Absolute Norms of Compliance and Contribution in the Global Climate Change Context," *Colorado Journal of International Environmental Law and Policy* 13, no. 2 (2002): 489.

questionable. Weisslitz agrees that the KP displays the "most rigid" application of the CBDR principle compared to other MEAs.[279]

Jutta Brunnée and Stephen J. Toope apply their interactional theory of international law[280] to the operationalisation of the CBDR principle in the UN climate regime and assess the regime's and the principle's legality. The basis of their analysis are the criteria of legality that are internal features of law and play an essential role in achieving compliance with the rules in questions. The eight criteria of legality,[281] as developed by Fuller, are promulgation, generality, clarity, non-retroactivity, non-impossibility of performance, non-contradiction, constancy, and congruence between practice and the law. Norms that are considered legitimate fulfil these criteria and convey a sense of legal obligation.[282]

Generally, a continuing practice of legality establishes and upholds legal norms; but sometimes the practice of legality also eliminates legal norms.[283] In other words, the criteria of legality have to be met and a community of practice must embrace them. Underlying principles and their substantive content need to be shared understandings. Then, it is possible that actors feel obliged to shape their behaviour in accordance with the norms in question.[284] Norms are accepted and internalised by states without a rigid sanction mechanism. This is particularly important in multilateral environmental regimes where cooperation to solve threatening problems is vital.

Brunnée and Toope conclude that the UNFCCC meets the criteria of legality, which also contributes to the Convention's resilience.[285] Generally, a framework convention mainly contains procedural provisions and subsidiary rules. However, letting the UNFCCC pass the criterion of clarity with respect to procedural provisions conceals both the scientific uncertainties about climate change mitigation, which at the time when the convention was drafted still existed, and the considerable political disagreement over how to address climate change.[286] In fact, the same is true with respect to the criterion of non-contradiction and congruence between international practice and the requirements of the UNFCCC.[287] Finally, the UNFCCC hardly fulfils the requirements of interactional law concerning the parties' substantive commitments.[288] The regime thus needed a protocol that –

[279] Ibid., 484.
[280] *See* for an overview of theoretical approach that Brunnée and Toope use (interactional account of international law), subsection 2.4.2.
[281] *See* for a summary of these eight criteria's role in constructing legality, subsection 2.4.2.
[282] Brunnée and Toope, 2010, 129–30.
[283] Brunnée and Toope describe these processes as norms being "built," "maintained," and "destroyed" through efforts to practice legality. *See*, Brunnée and Toope, 2010, 15.
[284] Ibid., 41.
[285] Ibid., 177–8.
[286] Ibid., 180–1.
[287] Ibid., 182–3.
[288] Ibid., 184.

within the established institutional framework and procedural rules – would develop the regime further and produce thicker substantive provisions. These were the tasks that the KP had to undertake.

However, the KP also fails to meet all criteria of legality and, according to Brunnée and Toope, only presents a "mixed picture."[289] The parties' evolving perceptions were increasingly at odds with the Protocol's modalities of emissions reduction relating to the criteria of generality, non-contradiction, and non-impossibility of performance.[290] The provisions on emissions reduction – the core activity of climate change mitigation that the KP seeks to regulate – were particularly affected by its approach to differentiation. Brunnée and Toope point to the fact that the Protocol's provisions on emissions reduction might contradict the UNFCCC's objective. The long timespan between the negotiation and implementation of the Protocol was problematic. In addition, the reductions made by developed states, even if fully implemented, would be insignificant in the global context. The Protocol also might increasingly be in tension with the evolving understanding of the CBDR principle.[291]

Finally, Brunnée and Toope analyse whether the CBDR principle and its operationalisation in the UN climate regime, until this stage of the regime's development, meet the legality criteria. The CBDR principle, in the wording of Article 3 (1) UNFCCC, does not meet the criterion of clarity, mainly because it does not explain the supposed difference between the concept of equity and the CBDR principle and it fails to delineate the CBDR principle in relation to a state's capabilities. Furthermore, the article's formulation does not explain which criteria guide the differentiation among states, which groups of states they distinguish, and whether they also apply within groups of states.[292] Non-retroactivity as one criterion of legality does not support the reading of the CBDR principle as relating to past contributions to global warming. These activities occurred without knowledge about their consequences for the climate.[293] The question of whether practice is congruent with the CBDR principle particularly concerned the period after the KP's entry into force. Brunnée and Toope conclude that the KP's approach to differentiation "was arguably in conformity" with the CBDR principle, mainly because developed states should take the lead in mitigating climate change. Nevertheless, emissions by developing states rose consistently, while the shared understandings of

[289] Ibid., 189.
[290] Ibid., 190.
[291] Ibid., 187, 189–90.
[292] Ibid., 190.
[293] Ibid., 191.

differentiation were evolving after about 2005. Brunnée and Toope argue that eventually these developments might render the KP incongruent with the CBDR principle.[294]

This brief summary of scholarly assessments of the CBDR principle's operationalisation in the early phase of the UN climate regime vis-à-vis expectations of the principle's influence, given its normative content, illustrate that legal scholars struggled with the differentiation that the UN climate regime prescribed and the reality of the immediate period after the KP entered into force. There was an increasing perception among legal scholars of the need to reassess the CBDR principle's operationalisation in this regime.[295] Eventually, the KP's insufficiencies would necessitate considerable structural adjustments or even a new treaty. However, the acknowledgement of the KP's insufficiencies would not lead to a deviation from the CBDR principle. Rather, the gist of the debate suggested a refinement.[296]

At that time, the prospect of reconsidering the CBDR principle's definition in the UN climate regime was largely rejected by Chinese scholars. Zhu Xiaoqin and Wen Haopeng view the outcome of retaining the CBDR principle in the UN climate regime but adjusting its definition as the "most unfavourable situation," as it would be the same as "handing over the most powerful weapon that developing states have in the climate negotiations."[297] They also point to the danger of "mixing the CBDR principle up with preferential treatment for developing states."[298] Both concepts are distinguished by the notion of responsibility that the CBDR principle includes. The CBDR principle needs to be defined as "a legal principle," while preferential treatment constitutes "some form of moral obligation in the sense of care of the strong for the weak."[299] According to this reading, the CBDR principle has a stronger normative impact.

Zhu and Wen also see the precautionary approach that is included in Article 3 (3) UNFCCC as "limited" by the CBDR principle. They argue that the inclusion of "different socio-economic contexts" supports this reasoning. Accordingly, they call upon Chinese scholars to prepare this line of thinking for future climate negotiations.[300] Given that China is a developing state, it is necessary to provide even more "solid" legal and moral arguments to stop attempts to "weaken" or "overthrow" the

[294] Ibid., 193.
[295] Cullet, 2015, 243.
[296] Brunnée and Toope, 2010, 193.
[297] Zhu Xiaoqin (朱晓勤), and Wen Haopeng (温浩鹏), "气候变化领域共同但有区别的责任原则： 困境，挑战与发展" [The CBDR principle in the realm of climate change: Problems, challenges, and development], 山东科技大学学报 [Academic journal of the Shandong university of science and technology] 12, no. 2 (2010): 33–8.
[298] Ibid., 35.
[299] Ibid.
[300] Ibid., 38.

CBDR principle. They also think that in general it is vital for the CBDR principle's development to "rely on international legal practice to promote its evolution into customary international law."[301]

Obviously, Chinese scholars treasure the CBDR principle as the core principle of the UN climate regime. The principle is primarily associated with the structure of the KP.[302] When assessing the CBDR principle's role in the UN climate regime, Chinese scholars primarily focus on the protection of its position in the regime, while rigidly adhering to the dichotomy of developed and developing states.[303] The relevance of the dichotomy is not questioned. Possible adjustments to changing economic circumstances are usually not studied. Although Bo Yan acknowledges global economic changes, she concludes that the CBDR principle's established operationalisation in the UN climate regime must be retained, in order to defend the current international legal order.[304]

Chen Yijian, however, noticed an ever diverging conceptualisation among the parties to the KP towards the end of the first commitment period in 2012.[305] When studying the possibilities of structuring the next commitment period, Chen points to China's options during the negotiations. It could continue to insist on the differentiation under the KP that entails a reading of the principle based on China's "national position."[306] However, at the same time it would be "necessary to deal with the principle's evolution and the impact thereof" and, subsequently, "try to formulate a counterstrategy" ahead of the negotiations.[307]

In addition, Chen discusses the notion of historical responsibility and points to the fact that between 1950 and 2000 most greenhouse gas emissions resulted from developed states' economic activity, but the historical emissions of some developing states "are not low either;" and if global efforts to reduce emissions only included Annex I parties (developed states), the objective of the UNFCCC could not be realised.[308] Based on an analysis of the emerging redefinition of the CBDR principle, Chen identifies a trend towards an interpretation in the sense of a "common responsibility," which "puts China under bigger international pressure."[309] The rapid increase of China's emissions from the year 2000 onwards had already caused many developed and some developing states to urge China to limit its emissions. However, in the domestic debate climate

[301] Ibid.
[302] Chen Yijian (陈贻健), "共同但有区别的责任原则的演变及我国的应对：以后京都进程为视角" [The evolution of the principle of common but differentiated responsibilities and China's response: From the perspective of the Kyoto process], 法商研究 [Law and commerce research], no. 4 (2013): 77–8.
[303] Zhu and Wen, 2010, 35.
[304] Bo Yan, 2013, 217.
[305] Chen, 2013, 78.
[306] Ibid., 76.
[307] Ibid.
[308] Ibid., 79.
[309] Ibid., 83.

change received less attention than other environmental issues, such as pollution, destruction of ecosystems, and resource deprivation.[310]

To balance domestic priorities and international pressure, Chen sees an option for China to manage the rising international pressure and "delay" the point in time from which onwards it would be obliged to implement emissions reductions. Considering the period of 2030 to 2040 during which the Chinese government expected the country's CO_2 emissions to peak, Chen prepares arguments for a Chinese agenda in negotiations about post-Kyoto arrangements in order to counter claims that China ought to assume growing responsibility. They include the need to take into account "survival emissions" that are vital for running an economy, "accommodative emissions" that would allow developing states an equitable share, "transferred emissions" resulting from exports of manufactured goods from developing states to developed economies, and per capita emissions.[311]

Furthermore, specific issues could be mentioned that prevent China from a quick implementation of climate measures. These are the problem of financing and technology transfer, insufficient capacity-building, and the structure of the Chinese energy system.[312] These arguments illustrate that, after the first commitment period, Chinese legal scholars were hardly able to justify the continuation of the rigid differentiation under the KP by relying on the CBDR principle.

The overview showed that throughout the years following the adoption of the KP the CBDR principle in the UN climate regime has attracted much scholarly attention. The debate on differentiation in the UN climate regime kept revolving around the main bone of contention – the lack of any binding emissions reduction obligations for developing states in the KP. As mentioned above, international legal scholars questioned the rigid differentiation that the principle's operationalisation in the KP brought about, while Chinese commentators interpreted the principle's role from a domestic viewpoint, without acknowledging China's by then improved economic conditions, at least compared to most developing states.

In any case, the international legal debate about the CBDR principle shows that the interpretation of the principle's meaning and function throughout the period of the adoption and implementation of the KP diverged considerably. Under these circumstances, shared understandings could barely emerge. After a few concluding remarks about the CBDR principle in the initial phases of the UN climate regime, section 4.4. will examine reasons for the different perceptions among members of the international community. It shows how the debate unfolded following the adoption

[310] Ibid.
[311] Ibid., 84.
[312] Ibid.

of the Berlin Mandate. The conflicting interpretations of the CBDR principle would eventually lead to a round of norm contestation, lasting until the adoption of the Paris Agreement, which chapter seven will discuss in detail.

4.3.4. Concluding remarks

The CBDR principle forms the culmination of efforts to include the consideration of developing states' circumstances in the negotiation and implementation of MEAs. This approach was generally referred to as differential treatment. In answer to the first sub-question of this dissertation, these concluding remarks, reflect on determinants that should be considered relevant for assessing the meaning and role of the CBDR principle in the UN climate regime.

Sections 4.2. and 4.3. showed that following the debate during the 1992 Earth summit and, in particular, the negotiation of the KP the aspect of finding innovative instruments to facilitate and support the participation of developing states took a back seat in the conceptualisation of the CBDR principle, especially compared to the notion that the more straightforward instrument of differential treatment conveys. The role of CBDR principle changed from the negotiation to the implementation phase of the UN climate regime, giving priority to different legacies that shaped the conceptualisation of the CBDR principle under this regime (*see* table 4.1).

In fact, attempts to interpret "responsibility" in the formulation of the principle dominated the debate. Although historical responsibility is a valid consideration in the assessment of how instances of environmental degradation were caused, this component diverted attention away from more practical issues of climate cooperation in its early phase. Through the rigid differentiation that this debate subsequently inspired it became difficult to establish which determinants would be relevant for assessing the meaning and role of the CBDR principle of the UN climate regime.

Table 4.1: Matrix of the CBDR principle under the UNFCCC and KP; its role and meaning

legacies that shaped the CBDR principle's *meaning*	
• development debate at UN level • differential treatment in international environmental law • China's efforts to shelter domestic economic development from international environmental rules	
dominant legacies in shaping the CBDR principle's *role*	
negotiation phase (UNFCCC)	• development debate at UN level • differential treatment in IEL
implementation phase (Berlin Mandate, KP)	China's efforts to shelter domestic economic development from international environmental rules
maturing phase (first round, implementation of the KP)	*contestation*

The consideration of differential treatment in other MEAs provides some clues of the determinants that need to guide an assessment of the CBDR principle in the UN climate regime. The nature of an international environmental regime necessarily proceeds from the environmental objective. It considers practical issues that impede the participation of developing states and means that developed states can provide to alleviate the situation. The notion of responsibility, in its different conceptualisations, then functions as reminder or reason for greater ambition on the part of developed states. Understanding the meaning of the CBDR principle in the UN climate regime by correlating responsibility with ambition regarding states parties' climate action, would allow the elements of the principle to convey an equitable and forward-looking meaning that embraces the UNFCCC objective.

4.4. CBDR in the UN climate regime as lynchpin of norm contestation

This section collects the dots from the findings in the preceding sections of this chapter and combines them with constructivist thinking. It aims to set the stage for the analysis that chapter

seven will present, considering the question of how the contestation of the CBDR principle's interpretation in the UN climate regime evolved. The first part of this section gives an overview of the theoretical underpinning for norm contestation. The second part summarises the events that marked the beginning of what chapter seven will assess as a round of norm contestation that took place during the period between 2005 and 2015 and centred on the CBDR principle's operationalisation in the KP.

4.4.1. Norm contestation and the UN climate regime

The legal core of the CBDR principle in the UN climate regime is twofold. Substantively, it aims to ensure equitable burden-sharing by applying states parties' obligations to reduce greenhouse gas emissions in accordance with their level of socio-economic development. Procedurally, it is a guarantee that the needs of developing states are taken into account in the course of climate negotiations and the implementation of regime's substantive provisions. Differential treatment in the context of mitigating climate change seems appropriate, given diverging contributions to the problem and differences in socio-economic development. However, the operationalisation of the CBDR principle in the UN climate regime has been contested, especially after the adoption of the KP. The rigid differentiation between developed and developing states is at the centre of contestation, as it leaves developing states without any additional obligations beyond those stipulated in the UNFCCC.

This chapter assessed both differential treatment and its inclusion in the UN climate regime. This assessment forms the basis for the analysis in chapter seven that will study the process of contesting the meaning of the CBDR principle and its outcome. The preceding sections of this chapter provided the factual background for this analysis. Analytical tools for examining the contestation of norms can be found in constructivist norm research, a sub-field of constructivist international relations (IR) research. Norm research investigates the emergence and evolution of norms. From the 1990s onwards, norm research has evolved into a rich body of IR research.[313] It is a useful framework for exploring the nature of disputes over the interpretation of norms. The following paragraphs summarise why this sub-field of constructivist IR research is of particular value for assessing the evolution of international legal norms.

[313] Rosert, Elvira. "Fest etabliert und weiterhin lebendig: Normenforschung in den Internationalen Beziehungen" [Establish and alive: Norm research in international relations], *Zeitschrift für Politikwissenschaft* 22, no. 4 (2012): 599–623; Hoffmann, Matthew J. "Norm Constructivism: Contesting International Legal Norms." In *Making Sense of International Relations Theory – 2nd edition*, ed. Jennifer Sterling-Folker (Boulder, CO: Lynne Rienner, 2013), 136–51; Sandholtz, Wayne, "Dynamics of International Norm Change: Rules against Wartime Plunder," *European Journal of International Relations* 14, no. 1 (2008): 101–31.

Applying approaches of norm research in IR, in particular the cycle of normative change introduced by Sandholtz,[314] gives insight into the nature of norm contestation and its outcomes. Furthermore, the model is able to clearly present the steps of normative change. In their assessment of international norm socialisation, Martha Finnemore and Kathryn Sikkink pioneered in describing the "life-cycle" of international norms.[315] The conceptualisation of international norms as evolving or being accepted in stages helps to detect causes of norm failure or norm change. Thus, the application of Sandholtz's model is helpful. It can illuminate the evolution of the CBDR principle's role in the regime, as it was redefined during a decade of cumbersome negotiations.

Constructivists consider norms as socially constructed. Norms give structure to what actors do. They change and evolve further in response to actors' activities. Constructivist approaches thus start with the premise that the identity of actors and normative structures are mutually constituted.[316] There is a dynamic relationship between agents and normative structures.[317] The characteristic of being mutually constituted necessarily implies the possibility of change and adjustment. An actor's identity and the normative structure in which that actor operates are not static. Contestation is an inevitable feature of evolving normative systems.[318] This realisation enables and even necessitates research on how international norms precisely change.

According to Sandholtz's model, the process of normative change evolves as a cycle and in stages. Actions within a normative structure and arguments about these actions eventually reshape the rules on which these actions were based.[319] The notion that actors and normative structures are mutually constitutive[320] is key to the process of normative change. In fact, disputes over the interpretation of norms initiate this process. Usually, a dispute relates to an action that actors take based on their interpretation of a norm.[321] When applying norms, actors interpret norms and are

[314] *Cf*. the explanation of this model in chapter two, especially subsection 2.4.2 and figure 2.2.
[315] Finnemore and Sikkink divide the life-cycle of international norms into three stages – i.e. norm emergence, norm acceptance, and internalisation. In the first stage, the norm is promoted at the international level by norm entrepreneurs – such as a number of states and/or non-governmental organisations. At the stage of gaining acceptance, states and international organisations increasingly regard compliance with the norm as belonging to a state's identity. It provides legitimacy, reputation, and esteem. The norm is part of the international socialisation process and is being institutionalised. The third stage is marked by a notion of completed internalisation; the norm is considered as a habit; and conformity is taken for granted. *See*, Finnemore and Sikkink, Martha, and Kathryn Sikkink, "International Norm Dynamics and Political Change," *International Organization* 52, no. 4 (1998): 898.
[316] Antje Wiener describes norms as having a dual quality of being both "structuring and constructed." *See*, Wiener, Antje, "Enacting Meaning-in-use: Qualitative Research on Norms and International Relations," *Review of International Studies* 35, no. 1 (2009): 180.
[317] Hoffmann, 2013, 138.
[318] Ibid., 138–9; Sandholtz, 2008, 105.
[319] Sandholtz, 2008, 110.
[320] Ibid., 102; Wiener, Antje, and Uwe Puetter, "The Quality of Norms is What Actors Make of It: Critical Constructivist Research on Norms," *Journal of International Law and International Relations* 5, no. 1 (2009): 1–16.
[321] Sandholtz, 2008, 103–4.

inevitably guided by their "subjective understanding of what their intersubjective or social context demands."[322]

Actors' understanding of normative systems are flawed or imperfect. Norms are usually formulated in a general way to achieve compromises among actors with diverging ideas and interests, especially at the international level. Since general norms cannot cover every specific situation, the application of norms often triggers disputes. Disagreement about the interpretation of norms either results from their generality and the specificity of concrete conflicts or conflicts between separate bodies within the normative system.[323] Thus, norm disputes evolve either because of the incompleteness of the normative system or contradictions within the normative system. Both forms of norm contestation generate tensions that require change.[324]

However, instances of norm contestation do not question the entire normative system. It is important to note that even before a dispute begins rules determine the range of strategic and discursive options that the disputants have.[325] Thus, the engagement of actors with each other and with the normative structure or regime is shaped by the deliberative space that this particular structure offers.

As already mentioned, interpretation often leads to contestation. More often than not, states interpret their commitments under international law differently.[326] Differences of opinion with respect to the interpretation of a norm generate arguments, which subsequently reshape the content of the norm and actors' behaviour.[327] In a complete cycle of normative change, four stages of interaction lead to an adjusted normative situation.

First, norms shape actors' choices; and an actor – for instance a state – bases a certain action on an international legal norm. Second, the interpretation of the norm is at the core of the disagreement. It might be disputed for two reasons. In the international realm, events are generally ambiguous, applying norms in a straightforward way is often difficult. Another possible reason for conflict is tension between different sets of rules.[328] Third, the state that applied the rule needs to convince other relevant actors in the regime that its interpretation reflects the content of the norm in question. To achieve this, it can use precedents that show which behaviour was accepted or

[322] Hoffmann, 2013, 138.
[323] Sandholtz, 2008, 101, 103–5.
[324] Hoffmann, 2013, 138.
[325] Sandholtz, 2008, 102.
[326] Hoffmann, 2013, 137.
[327] Sandholtz, 2008, 101.
[328] Ibid., 106.

condemned in the past. Arguments that are not based on precedents can also be weighed when trying to persuade other actors.[329]

Accordingly, normative change eventually results from arguments and persuasion. Support from influential states for the arguments carries great weight. It also helps if the state in question can present more numerous and more recent precedents than its opponents. Thus, the interpretation of the norm that was put forward is persuasive when other actors and precedents support it; and it is considered as compatible with existing and widely accepted norms.[330]

In the fourth and final stage of the cycle, the arguments modify the disputed initial norm. This modification can concern the substantive content of the norm or other dimensions, such as its strength, clarity, or specificity.[331] The cycle of normative change thus completes one round and establishes a new context on which subsequent choices for actions by states are based. The process of disputing over the interpretation of a norm helps actors to discover the norm's scope of application and meaning.[332] The arguments that are presented eventually change the norm. It is a process of linking norms to actions and actions to arguments. The completion of a cycle of normative change influences the meaning of the norm and reshapes it.[333] Moreover, a round of argumentation also broadens the range of precedents that are available in future disputes. A new cycle begins as soon as actors again apply the norm in a way that causes conflicts about the its meaning. Hence, normative structures do not stand still.[334]

Finally, it is important to note that the illustration of normative change as a circular shape can be best imagined as a spiral or norm cascade,[335] mainly because after a round of normative change the normative context or situation finds itself at another level.[336] It can move either upwards or downwards in terms of the norm's maturing and substantive development.

To examine the outcome, a qualitative study of the stages is necessary. Mona Lena Krook and Jacqui True suggest a discursive approach to assess deliberations during a process of norm evolution.

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[329] Ibid., 107.
[330] Ibid., 109.
[331] Ibid., 110.
[332] Ibid., 103–4; Hoffmann, 2013, 139.
[333] Sandholtz, 2008, 101.
[334] Ibid., 101, 103.
[335] Risse and Sikkink describe the shape of the cycle of normative change as a spiral, while Finnemore and Sikkink allude to the notion of "norm cascade." *See*, Risse, Thomas, and Kathryn Sikkink, "The Socialisation of International Human Rights Norms into Domestic Practices: Introduction," in *The Power of Human Rights: International Norms and Domestic Change*, ed. Thomas Risse, Stephen C. Ropp, and Kathryn Sikkink (Cambridge: Cambridge University Press, 1999), 17–35; Finnemore and Sikkink, 1998, especially at 902–4.
[336] The norm contestation with respect to the interpretation of the CBDR principle that chapter seven will be present is illustrated as a spiral. *See*, figure 7.1. in subsection 7.2.1.

[337] According to Audie Klotz and Cecilia Lynch, discourse analysis can help to "capture the creation of meanings and accompanying processes of communication."[338] Following their approach, it is possible to make some comparisons or establish a baseline that is needed to gauge change[339] when assessing the UN climate regime.

Combining the discursive approach with constructivist research on norms is worthwhile. In this combination, constructivism "supplies" the notion of a mutually constitutive relationship between actors' identities and normative structures, while the discursive analysis helps to highlight the fluidity of evolving norms that interact with actors' identities, as part of the process of mutual constitution. When assessing the CBDR principle, the combination of constructivist and discursive approaches facilitates the inclusion of various normative and extra-legal developments that influence the definition of the principle.

Chapter seven will apply the discursive approach to decisions that were adopted during annual COPs meetings. These decisions reflect the regime's internal normative evolution. Domestic policies and legislation as well as the changing global energy system, which will be studied in chapter five, form an external normative and extra-legal context that also feeds into the UN climate regime and informs the contestation of the CBDR principle's interpretation.

By deploying and combining these theoretical approaches and factual developments, the analysis can accentuate the link between legal concepts, political and economic circumstances, prevailing ideas, and normative change. It thus contributes to a better understanding of the dynamics that shaped the evolution of the CBDR principle in the UN climate regime. This approach helps explain why the principle's interpretation eventually tilts towards a certain direction.

The previous subsection 4.3.3. showed that the operationalisation of the CBDR principle has to be evaluated in the broader context of differential treatment in international environmental law. The formulation of the CBDR principle in the early 1990s added the component of responsibility of developed states. In the UN climate regime, this component emphasises the demand that developed states take the lead in global efforts to combat climate change.

Section 4.3. demonstrated that normative developments relating to the CBDR principle's operationalisation in the UN climate regime are two-pronged. First, differential treatment became a common feature in international environmental law as a means to accommodate specific shortcomings in the capabilities of developing states with respect to the implementation of MEAs.

[337] Krook, Mona Lena, and Jacqui True, "Rethinking the Life Cycles of international Norms: The United Nations and the Global Promotion of Gender Equality," *European Journal of International Relations* 18, no. 1 (2008): 108.
[338] Klotz and Lynch, 2007, 19.
[339] Ibid.

Second, China, together with other developing states, insisted on the inclusion of the CBDR principle in the UNFCCC with a strong emphasis on the responsibility of developed states. This approach resulted in an overtly asymmetric design of core mitigation obligations in the KP.

The operationalisation of the CBDR principle in this manner was rejected or at least criticised by other major parties to the UN climate regime and continued to be a matter of contention after the Protocol's entry into force. The cycle of normative change with respect to the CBDR principle's operationalisation in the UN climate regime concerned the CBDR principle's interpretation in the context of the substantive evolution of the UN climate regime and related to the regime's objective.

When developing states rejected any additional commitments under the KP, differential treatment was not contextualised in a meaningful way and the regime's environmental objective was insufficiently acknowledged. Compared with other MEAs that were adopted during the same period, this form of differentiation was exceptional.[340] Accordingly, differentiation in comparable legal regimes and the objective of the UNFCCC provide arguments in the pursuit of normative contestation. Following the adoption of the KP, the criticism of other actors and in particular the withdrawal of the U.S. from the Kyoto process, initiated the cycle of norm contestation that aimed to reassess operationalisation of the CBDR principle in the UN climate regime.

The contestation mainly concerned the position of the big emerging economies among developing states, which under the KP did not have any binding obligations to limit their rapidly growing greenhouse gas emissions. In the course of the debate about how to deal with this practical issue, it became clear that the way in which the CBDR principle's operationalisation was accepted in the early 1990s – especially the categorisation of states parties – could hardly be the basis of international climate cooperation in the 21st century. The last subsection of this chapter summarises the response to the adoption of the KP.

4.4.2. Contesting the no-binding-obligation paradigm

On 27 July 1997, the U.S. Senate adopted the Senate Resolution 98 (Byrd-Hagel Resolution).[341] This Resolution directly interfered with the ongoing negotiations about the KP. It determined that the U.S. should not sign a protocol that would "mandate new commitments for Annex I Parties, unless the protocol or other agreement also mandates new specific scheduled commitments to limit or reduce

[340] *Cf.* the discussion of several MEAs and the Rio Declaration in subsection 4.2.3 of this chapter.
[341] S.Res. 98 (1997) – A resolution expressing the sense of the Senate regarding the conditions for the United States becoming a signatory to any international agreement on greenhouse gas emissions under the United Nations Framework Convention on Climate Change, 27 July 1997.

greenhouse gas emissions for Developing Country Parties within the same compliance period."[342] The Resolution refers to the Berlin Mandate that in its Paragraph 2 (b) exempts developing states from "any new commitments"[343] and points to "rapidly increasing" greenhouse gas emissions of developing states, which at that time were expected to surpass the emissions of developed states in the coming two decades.[344] The Resolution passed by a 95-0 vote. Hence, an agreement that did not fulfil the criteria presented in the Resolution would probably not be ratified.

Despite much criticism of this move by the U.S. Senate, it must be noted that the Resolution did not oppose the CBDR principle. Rather, the Resolution doubted the effectiveness of the climate agreement without some participation of developing states. It is important to emphasise that during the debate most senators supported the notion that the U.S. was more responsible for the mitigation of climate change and needed to lead efforts to reduce emissions, while assisting developing states with their actions. Thus, the Byrd-Hagel Resolution did not reject the CBDR principle, but sought to interpret it.[345] From the deliberations both in the Senate and statements by the U.S. government,[346] it is clear that the main concern related to rising emissions originating from some developing state with growing economies. These states should take "meaningful actions to address climate change," while the U.S. did not expect them to reduce emissions right away.[347]

The Byrd-Hagel Resolution and the debate in the U.S. were an important event in the further evolution of the UN climate regime for three reasons. First, it was an unmistakable sign that the CBDR principle's operationalisation in the KP was contested by one of the regime's major parties that had been a crucial advocate of global climate action in the past. It aimed to reconsider the way in which China, together with other developing states, interpreted the responsibility component of the principle. Their interpretation mainly ensured developing states' ability to exercise their right to development, while developed states had to accept binding reduction obligations. Second, by referring to rising emissions from some developing states the Resolution and the debate in the Senate pointed to increasingly diverging positions within the group of developing states. By the mid-1990s, it was clear that growing emissions from China as a result of the country's economic transformation would have a severe impact on efforts to stabilise the concentrations of greenhouse gases in the atmosphere, which Article 2 of the UNFCCC states as the objective of international

[342] S.Res. 98 (1997), para 7–13.
[343] Berlin Mandate, para 2 (b).
[344] S.Res. 98 (1997), pp. 2–3.
[345] Harris, 1999, 37–42; Rajamani, 2000, 128.
[346] *See* summary, Harris, 1999, 37–45.
[347] White House, "Comprehensive Framework for Effective, Sensible Action," 22 October 1997, http://clinton2.nara.gov/Initiatives/Climate/framework.html.

mitigation efforts. China's clear opposition to any debate about commitments on its part, pointing to its status as a developing state, affected the negotiations negatively.[348] Indeed, during the negotiations of the KP the consideration of the position of developing states generally took place in an uncompromising atmosphere.[349] In addition, bilateral Sino-U.S. relations were also deteriorating during this period.[350]

In China's climate diplomacy, environmental concerns related to climate change were not dominant. Instead, the topic was considered a vital economic matter. From the outset, the Chinese leadership saw climate change less urgent than other more immediate environmental problems. Since climate change mainly related to economic policy, it was treated as a sensitive foreign policy issue. Consequently, it was evaluated in the context of China's overall relations with both the G-77 states and the United States.[351] Hence, the Chinese leadership linked negotiations about the climate change problem with strategic economic interests, while in the U.S. many interpreted China's reluctance to contribute more as an expression of its unwillingness to assume a greater global role, as it seemingly dodged the responsibility for solving an existential environmental problem. Under these circumstances, formulating a shared interpretation of the CBDR principle to further contribute to the UN climate regime's evolution seemed impossible.

In the following period of contestation, the efforts by the EU and other states parties kept the UN climate regime alive. Annual conferences were held. The KP was adopted and entered into force in 2005. The U.S. stayed outside of this process,[352] while the application of the CBDR principle in the UN climate regime remained contested. The "community of practice"[353] that is needed to maintain and uphold legal norms was shattered.

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[348] *See* for China's negotiating position, Lewis, Joanna I., "China's Strategic Priorities in International Climate Change Negotiations," *The Washington Quarterly* 31, no. 1 (2008): 162–3; Cooper, Deborah E., "The Kyoto Protocol and China: Global Warming's Sleeping Giant," *The Georgetown International Environmental Law Review* 11, no. 2 (1999): 416–7; *see* for China's policy after the adoption of the KP, Oberheitmann, Andreas, and Eva Sternfeld, "Climate Change in China: The Development of China's Climate Policy and Its Integration into a New International Post-Kyoto Climate Regime," *Journal of Current Chinese Affairs* 38, no. 3 (2009): 139–43.

[349] *See*, for instance, Harris, 1999, 34.

[350] Issues that contributed to this deterioration were the implementation of U.S. sanctions following a worsening human rights situation in China in the aftermath of the regime's violent response to the student and worker protests in 1989 and the 1996 Taiwan Strait Crisis. *See*, Garver, 2016, 498–502, 607–33; *see* for the dynamics in the bilateral Sino-U.S. climate relations, Vandenbergh, Michael P., "Climate Change: The China Problem," *Southern California Law Review* 81, no. 5 (2007): 914–28.

[351] The dominance of economic and foreign policy considerations is reinforced by the fact that economic and foreign affairs officials control the domestic policy-making process on climate change. *See*, Tangen et al, 2001, 245; Stalley, 2013, 3; Heggelund, Gørild, "China's Climate Change Policy: Domestic and International Developments," *Asian Perspective* 31, no. 2 (2007): 177; Economy, Elizabeth C., "Chinese Policy-making and Global Climate Change: Two-front Diplomacy and the International Community," in *The Internationalization of Environmental Protection*, ed. Miranda Scheurs and Elizabeth C. Economy (Cambridge: Cambridge University Press, 1997), 19–41.

[352] The U.S. had signed the KP, but it could not be ratified. In 2001, President George W. Bush repudiated the KP. The U.S. was no longer a party of the KP; it left the Kyoto process.

[353] Brunnée and Toope, 2008, 352.

4.5. Concluding remarks

This chapter primarily followed the differentiation storyline. It explored the emergence of the principle of *common but differentiated responsibilities*, focusing on its origins and its inclusion in this formulation as a principle in the Rio Declaration and UNFCCC. The incorporation of the principle in these documents was a success of joint efforts by the Chinese government and dozens of developing states. Thus, in 1992 the CBDR principle entered general international environmental law and the legally binding UNFCCC that created the UN climate regime.

The G-77 and China grouping continued to support the operationalisation of the CBDR principle in the UN climate regime, centring around the responsibility of developed states for causing climate change. This extended approach to differential treatment culminated in a "rigid" differentiation between developed and developing states that the 1995 Berlin Mandate introduced. It significantly shaped international climate cooperation under the KP. The interpretation of the CBDR principle became a source of contention among states parties and would feature heavily in a round of norm contestation for years to come.

Linking the differentiation storyline with the *dimensions* of *time*, *imagination*, and *complexity* illuminates the origins of the contestation and highlights the relevance of this decade-long contention for the further evolution of the UN climate regime. The dimension of time was noticeable throughout the sections of this chapter. On the one hand, the inclusion of the CBDR principle in the Rio Declaration and the UNFCCC during the 1992 Earth Summit translated the main propositions of a 1970s UN debate about inequality in the international system into guidelines for decision-making in the post-Cold War era. On the other hand, the negotiation and establishment phases of the UN climate regime were marked by the contemporaneousness of negotiations about China's bid to accede to the World Trade Organization (WTO) and relentless economic globalisation. No doubt, the Chinese leadership saw their country's accession to the WTO in 2001 as a means to fast-track its economic reforms and development.

Indeed, China's economic development accelerated after the turn of the century. At the time when the KP entered into force, Chinese energy companies, on average, opened one new coal-fired power plant every week. Coal-based political and economic interests expanded to many parts of the country, which for years to come would hamper any attempt to turn away from the fossil economy. In fact, large-scale investments in carbon-intensive power generation and steel producing capacity continued for more than a decade after 2000. It facilitated China's emergence as a main exporter of manufactured goods and steel, while China's CO_2 emissions overtook those of the U.S. in total

numbers halfway through the first decade of the 21st century and its per capita emissions have been on par with those of the EU since about the same time. At that time, China did not intend – and was not obliged – to limit its greenhouse gas emissions under the UN climate regime.

The KP's first commitment period only began in 2008. Its rules, especially the categorisation of states, proved unable to keep up with the rapidly changing global economic situation and energy landscape. The Protocol's structure and its substantive approach became outdated before the states parties could resolve its main flaws.

Compliance derives from compelling procedural and substantive rules. This chapter mentioned that in order to ensure the compliance of states parties with their commitments under an international agreement, its rules need to reflect shared understandings. One salient aspect that this chapter considered in this context concerned the legality of the CBDR principle's operationalisation in the KP. Obviously, it is vital for the UN climate regime's coherence and states parties' contributions to maintain and convey legality. The operationalisation of the CBDR principle is essential for the Protocol's level of legality.

When considering these issues, the chapter incorporated an assessment by Brunnée and Toope of the KP's legality and its ability to secure compliance, based on the interactional theory of international law. They suggest that over time the KP might become incongruent with the CBDR principle if emissions from developing states with large economies would rise considerably,[354] which would negatively affect the UN climate regime's legality and the compliance pull that the Protocol has. For many, this moment in time arrived fairly soon and made an unnerving backdrop for the ensuing round of norm contestation, which centred upon the interpretation of the CBDR principle.

The KP's main point of contention also relates to the dimension of imagination. The conceptualisation of the UN climate regime was influenced by the international legal approach to stop the depletion of the ozone layer. As briefly discussed in this chapter, the ozone regime consists of a framework convention, while the specific obligations of the states parties are regulated in the Montreal Protocol. Seen through the lens of environmental degradation, the emission of greenhouse gases seemed similar to the atmospheric interference of ozone-depleting substances. Thus, the emission of these gases was also imagined as a problem of atmospheric pollution. The way in which the climate problem was conceptualised determined the approach to its solution. The states parties agreed to a limitation or even percentage reduction of their greenhouse gas emissions. Differential treatment afforded to developing states would primarily relate to this central mitigation task.

[354] Brunnée and Toope, 2010, 193.

Moreover, developed states, in an attempt to achieve more equity at the global level, consented to take the lead in combatting climate change.

This chapter showed that differential treatment of developing states in international environmental law greatly influenced the evolution of the UN climate regime. The initial institutionalisation of norms for international environmental cooperation, marked by the 1972 Stockholm Declaration, was also the beginning of linking developmental issues with what was perceived as a global environmental crisis. The ensuing debates about development at the United Nations were confrontational and led to political declarations that sought to revise the entire international economic order. The legacy of these debates was embedded in the operationalisation of the CBDR principle in the UNFCCC and KP.

This leads to the dimension of complexity. In fact, the mitigation of climate change would prove much more complex than the reduction of ozone-depleting gases in the atmosphere. CO_2, as the main greenhouse gas, was emitted in every state of the world. The fossil economy was a global phenomenon; and energy demand was rising fast during and after the period when the UNFCCC and KP were adopted. Developing states in particular added ever more coal-fired power plants and cars to global energy consumption patterns.

The fossil economy has been the basis of economic globalisation. The energy sector was also globalising, beyond the global market for crude oil and oil products. From a regulatory perspective, the 1990s were a brief and remarkable spell in post-war history. The decade after the end of the Cold War witnessed an adjustment of economic policies and legislation in the U.S., EU, and China that were guided by the idea of leaving allocation of resources to the magic powers of liberalised markets. These ideas not only influenced the instruments of the KP but also shaped the restructuring of energy sectors in the three jurisdictions, as the next chapter will explain. The diverse outcomes that the restructuring of the electricity market had in the three jurisdictions affected the progress of climate measures and warrants a closer examination of national circumstances.

National components of global efforts to mitigate climate change link the storylines of differentiation and decarbonisation. Chapters five, six, and seven will elaborate how both storylines were increasingly dovetailing towards the adoption of the Paris Agreement, in which all states parties agreed to formulate "low-greenhouse gas emissions development" strategies.[355] Chapter seven will show how normative and extra-legal developments redefined the CBDR principle, by presenting this process as a cycle of normative change. With the adoption of the Paris Agreement, the states parties

[355] This is the formulation that the Paris Agreement uses for decarbonisation. *See*, Article 2 (1) (b) of the Paris Agreement.

arrived at a new equilibrium with respect to the principle's interpretation and operationalisation. This equilibrium reconstitutes the level of legality of the UN climate regime's norms, while the Paris Agreement's substantive content matches the regime's procedural achievements. Thus, this chapter laid the basis for the analysis in the following chapters that will explain this evolution.

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CHAPTER FIVE

Interaction of legislative trends:

Crucial emitters and legislators on going low-carb

5.1. Introductory remarks

Opponents of the KP among U.S. lawmakers had feared that it would have "the potential of bringing under direct national and international control virtually every aspect of a nation's economy."[1] The expectation that the mitigation of climate change would have a huge economic impact was undoubtedly correct. Mitigation measures, especially the decarbonisation of energy generation, would eventually lead to an abandonment of the fossil-fuel based economy. However, during the immediate period after the KP's entry into force this transformation only unfolded incrementally and was not prescribed by international rules. This chapter shows that prior to 2015 the biggest adjustments took place in the electricity sector, which since the late 1990s had witnessed the enactment of many new policies and laws.

Chapter three stressed that the states parties had been unable to conceptualise how climate change should be mitigated when they adopted the KP. This chapter captures domestic developments and shows that the implementation of domestic energy and climate legislation was essential for contemplating how emissions reductions could be achieved. Thus, this chapter examines how domestic rulemaking contributed to the conceptualisation of climate change mitigation until the adoption of the Paris Agreement in 2015.

[1] Hagel, 1997, 17.

The chapter also explores the communication of these experiences to the international level. Based on these findings, chapter six studies how the UN climate regime received this transmission; and chapter eight offers a brief reflection on both legislative and policy developments and the state of international climate cooperation at the end of the second decade of the 21st century.

The analysis of this chapter focuses on the electricity sector. Centring the assessment on the electricity sector is warranted for two reasons. First, initial steps towards fulfilling the objective of the UN climate regime were made in this sector. Second, by the time that the Paris Agreement was adopted, it was widely accepted that any effort to effectively mitigate climate change would hinge on the implementation of low-carbon measures in the generation of energy.[2] Moreover, the electricity sector would further consolidate its position as the core of the energy system in the decades to come.[3] The electrification of the energy system would continue and also increasingly facilitate the transport of goods and people and the provision of heating.[4]

Accordingly, in the future the development of the electricity sector will to a large degree shape the emissions record of the global energy system, mainly because it is expected that the *share* of electricity in the world's total final energy consumption[5] will further increase during the next decades.[6] Technological and regulatory innovation in the power sector will significantly influence all other segments of the energy sector, including their low-carbon paths. In addition, the demand for electricity will grow in *absolute* terms.[7] Hence, the decarbonisation of electricity production is central to the low-carbon transition of the economy.

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[2] The International Energy Agency (IEA) points to the fact that the production and consumption of energy are responsible for about two-thirds of all global anthropogenic greenhouse-gas emissions and concludes that "effective action in the energy sector" is "essential to tackling the climate problem." *See*, IEA, *World Energy Outlook Special Report: Energy and Climate Change*, Paris: OECD/IEA, 2016c, 20.

[3] By the mid-2010s, electricity was already the core of the energy system. In 2014, 66.7% of the world's electricity production relied on fossil fuels. The share of fossil fuels in electricity generation even increased during the first two decades of the 21st century, mainly because China and, to a much lesser degree, India and other developing states built hundreds of new coal-fired power plants. It was estimated that by 2050, electricity would overtake oil as the dominant global energy carrier. *See*, International Energy Agency (IEA), *Energy Technology Perspectives 2014: Harnessing Electricity's Potential*. Paris: OECD/IEA, 2014(b), 119; International Energy Agency (IEA), "Key Electricity Trends – Excerpt from Electricity Information 2016," 2016, https://www.iea.org/publications/freepublications/publication/KeyElectricityTrends.pdf, p. 3; IEA, 2016a.

[4] IEA, 2014b, 119.

[5] Total final energy consumption is the entire energy that is consumed by end users – i.e. households, industry, road, rail and air transport, services, agriculture and other sectors. It excludes energy that is consumed by the energy sector itself. *See*, European Commission, "Glossary: Final Energy Consumption," http://epp.eurostat.ec.europa.eu/statistics_explained/ index.php/Glossary: Final_energy_consumption.

[6] In 1973, the world's total final consumption was 4,661 million tonnes oil equivalent (Mtoe) and reached 9,425 Mtoe in 2014. The share of electricity in the total final consumption almost doubled during that period. In 1973, the share of electricity was 9.4%; by 2014 it had increased to 18.1%. In the 1970s, electricity ranked fifth among all fuels for end use. By the mid-2010s, electricity belonged to the most important sources of energy for end consumers. It is the second most important fuel after oil (47.2%). The share of electricity in the composition of end consumption will further increase mainly because industry continues to electrify and the use of electrical appliances and cooling in buildings will grow. *See*, IEA, "Key World Energy Statistics – 2016," 2016, https://www.iea.org/publications/freepublications/publication/KeyWorld2016.pdf, p. 28; IEA, *World Energy Outlook 2013*, Paris: OECD/IEA, 2013, 169.

[7] Between 1974 and 2014, global gross electricity production increased from 6,287 terawatt hours (TWh) to 23,815 TWh. Thus, during this period the world's gross electricity production almost quadrupled. The IEA estimates that the demand for electricity will continue to rise, especially in non-OECD states. To meet growing demand, global installed generating capacity would need to grow by roughly 70% from 2012

Although strategies to decarbonise the entire energy system were not yet fully developed by the mid-2010s, many states had already adopted legislation to commence the low-carbon transition of the electricity sector. This chapter acknowledges the central role of the electricity sector in the global debate on climate change mitigation and examines domestic legislation that at that time pertained to the regulation of the low-carbon transition in this sector.

In order to put the low-carbon transition into perspective, this chapter traces the development of the electricity sector back to the initiation of market liberalisation policies and then specifically surveys measures to decarbonise power generation in the EU, U.S., and China until 2015. By doing so, this chapter demonstrates how political and economic factors as well as legal environments have created specific regulatory, institutional, and societal contexts that determine which avenues emerge for the shift from fossil fuels towards renewable energy sources. The chapter thus takes a glance at the construction of decarbonisation, albeit in an early phase. It shows that the conditions for this transition vary considerably for each jurisdiction. The chapter argues that there will be no "one-size-fits-all" solution – both with respect to the design of emissions reduction measures and the time schedule of the low-carbon transition.

This chapter provides an overview of laws and regulations that the EU, U.S., and China, the biggest emitters of greenhouse gases, passed to implement low-carbon measures in the power sector. By the mid-2010s, their combined energy-related CO_2 emissions[8] made up more than half of the global total (54.4% in 2014). Furthermore, given their weight in the global energy sector and their contribution to the emission of greenhouse gases during the period from 1990 to 2015 the EU, U.S., and China were the key actors in the global decarbonisation discourse.[9] Changes in their energy sectors had considerable traction. Throughout the history of the UN climate regime, these three parties were key to the regime's further evolution.[10] By assessing legislative and policy developments at the domestic level, this chapter answers the first sub-question that helped to guide this research project. The sub-question considers a potential linkage between domestic legislation and the structural approach to climate action at the global level:

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to 2035. It was expected that within the next two decades, the capacity of 5,649 gigawatts (GW) would expand to about 9,760 GW. *See*, IEA, "Key Electricity Trends," 2016, p. 3; IEA, 2013, 169.

[8] The percentage for energy-related emissions is used here. A dissection into electricity-related emissions is difficult to obtain, as some power-producing facilities are simultaneously used to generate heat (co-generation).

[9] In 2014, global energy-related CO_2 emissions amounted to 32,381 million metric tonnes. China was by far the largest emitter with 8,744 million metric tonnes of CO_2. It was responsible for 27% of all global energy-related CO_2 emissions. The U.S. came second with 5,412 million metric tonnes (16.7% of the global total); and the 28 member states of the EU emitted 3,462 million metric tonnes (10.7%). *See*, IEA, "Key World Energy Statistics – 2016," 2016, p. 45; U.S. Energy Information Administration, "International Energy Statistics," http://www.eia.gov/beta/international/data/browser/#.

[10] *Cf.* preceding chapters on the establishment of the UN climate regime and the construction of these actors' identities within the UN climate regime (subsection 3.3.2. of chapter three) and on the role of the CBDR principle in the UN climate regime and the appreciation of the principle's function held by these three actors (sections 4.3. and 4.4. of chapter four).

2. *Does the study of* ***domestic energy legislation*** *reveal* ***indicators*** *for both a* ***reconstruction of the UN climate regime*** *and a reorientation of the CBDR principle?*

Accordingly, this chapter discerns general patterns that shaped the regulation of the power sector from the 1990s until the mid-2010s and aims to comprehend how decarbonisation policies entered the domestic regulatory frameworks. Three mutually compatible theoretical approaches help conduct the analysis. Research approaches that focus on transnational competition as driver of *policy diffusion*[11] and *socialisation in international affairs*[12] help to explain how decarbonisation entered the realm of policymaking in the three jurisdictions and subsequently interacted with the UN climate regime. The nature of decarbonisation as an ideational concept is put into perspective by relying on the *constructivist* appreciation of the role of ideas in economic policymaking, as explained in chapter two.

Chapter three explained the social construction of climate change and its mitigation in the three jurisdictions. It offered some initial thoughts about the different outcomes of these processes. This chapter continues this investigation and illustrates how varying perceptions, together with specific circumstances of the energy systems and national political contexts, influenced the mitigation paths of the three jurisdictions.

This chapter links the domestic and international locales of rulemaking. In order to contextualise global decarbonisation efforts, the next section assesses the outcomes of market liberalisation policies and political and economic changes that affected the regulation of the electricity sector until 2015. The section also explains the process of enacting low-carbon policies and explores how efforts to decarbonise power generation became salient drivers for restructuring the

[11] *See* on mechanisms of policy diffusion, Gilardi, Fabrizio, "Transnational Diffusion: Norms, Ideas, and Policies," in *Handbook of International Relations*, ed. Walter Carlsnaes, Thomas Risse, and Beth Simmons (London: SAGE, 2012), 453–77; Gilardi, Fabrizio, "Who Learns from What in Policy Diffusion Processes?," *American Journal of Political Science* 54, no. 3 (2010): 650–66; and specifically on competition Baybeck, Brady, William D. Berry, and David A. Siegel, "A Strategic Theory of Policy Diffusion via Intergovernmental Competition," *The Journal of Politics* 73, no. 1 (2011): 232–47; and Dobbin, Frank, Beth Simmons, and Geoffrey Garrett, "The Global Diffusion of Public Policies: Social Construction, Coercion, Competition, or Learning," Annual Review of Sociology 33 (2007): 457–60.

[12] *See* on the consideration of socialisation in international relation research, Schimmelfennig, Frank, "Internationale Sozialisation neuer Staaten: Heuristische Überlegungen zu einem Forschungsdesiderat" [International socialisation of new states: Heuristic thoughts about the necessity of a new field of research], *Zeitschrift für International Beziehungen* 1, no. 2 (1994): 335–55; Schimmelfennig, Frank, "International Socialisation in the New Europe: Rational Action in an Institutional Environment," *European Journal of International Relations* 6, no. 1 (2000): 109–39; Flockhart, Trine, "'Complex Socialisation': A Framework for the Study of State Socialisation," *European Journal of International Relations* 12, no. 1 (2006): 89–118; Schimmelfennig, Frank, "Internationale Sozialisation: Von einem ‚erschöpften' zu einem produktiven Forschungsprogramm?" [International socialisation: From an 'exhausted' to a productive field of research], in *Die neuen internationalen Beziehungen: Forschungsstand und Perspektiven in Deutschland* Sozialisation [New international relations: State of affairs and perspectives of this field of research in Germany], ed. Gunther Hellmann, Klaus Dieter Wolf, and Michael Zürn (Baden-Baden: Nomos, 2003), 401–27.

sector in many parts of the world. The third section focuses on the EU, U.S., and China. It studies both the legislation to restructure the power sectors in these three jurisdictions and the regulation of the low-carbon transition[13] and analyses how general pathways to the low-carbon transition were reflected in their policies and legislation by the mid-2010s. The analysis also examines how the policies and laws resonated with the specific political and economic circumstances of these jurisdictions. Subsequently, the fourth section offers some thoughts that explain the construction of decarbonisation in different jurisdictions and its outcome. The section also illustrates how outcomes of these processes are transmitted to the global level and interact with the UN climate regime. The fifth section concludes.

5.2. Decarbonising power production

During the two decades prior to 2015, electricity sectors in advanced and emerging economies had already been struggling with the regulatory aspects and challenges of liberalisation policies. In addition, many states set the first steps towards a low-carbon power system after the turn of the century. This section chooses a historical perspective to discuss both transformation processes, including relevant regulatory trends. The aim is to provide an overview of the main developments in the power sector until the parties to the UN climate regime submitted their first NDCs right before the adoption of the Paris Agreement in 2015.

This section assesses how the two transformation processes – liberalisation and decarbonisation – have been reconstituting the electricity sector since the late 20th century, leading to a distinctive regulatory and structural composition in each jurisdiction. Still, the task that regulatory adjustments seek to achieve in the context of the low-carbon transition can be generalised, despite the fact that some challenges and approaches differ. This task consists of three main components – i.e. renewables support schemes, carbon pricing, and regional power market integration.

[13] In 2014, global energy-related CO_2 emissions reached 32,381 million metric tonnes. With 8,744 million metric tonnes of CO_2, China was by far the largest emitter. It was responsible for 27% of all global energy-related CO_2 emissions. The U.S. came second with 5,412 million metric tonnes (16.7% of the global total); and the 28 member states of the EU emitted 3,462 million metric tonnes (10.7%). *See*, IEA, "Key World Energy Statistics – 2016," 2016, p. 45; U.S. Energy Information Administration, "International Energy Statistics," http://www.eia.gov/beta/international/data/browser/#.

5.2.1. Incomplete liberalisation, hybrid electricity sectors

The power sector is "a complex amalgam of power plants, millions of kilometres of lines in the transmission and distribution network and billions of end-users, with system operators balancing demand and supply in real time."[14] Attempts to introduce new policies must be mindful of this complexity.

In the past, the power sector was regarded as a "natural monopoly industry."[15] This economic reasoning suggests that in such an industry public or private monopoly suppliers are best suited to guaranteeing efficient production. It was thought that competition between two or more companies would not be beneficial in sectors that are responsible for the provision of vital infrastructure services such as gas distribution, telecommunications, and power generation. Thus, in these sectors governments regulated prices, market entry, investment, and service quality.[16]

This perception was also applicable to the power sector in the early stages of its development. The power sector developed in conjunction with post-war industrialisation, driven by the huge energy demand of this endeavour. During this process, the involvement of the state in network utilities was considered key to economic development and the promotion of national interests. Therefore, state bureaucracies – ideally independent of ideological convictions – sought to safeguard the deployment of essential services.[17]

Monopolies generally have some severe disadvantages. Various economic performance problems, such as excessive prices, production inefficiencies, expensive duplication of facilities, poor service quality, and unfavourable distributional impacts, occur in markets with monopolistic characteristics. These performance problems are usually addressed by antitrust policies as well as administrative regulation.[18] Indeed, following the post-war period both academics and policymakers gradually questioned the natural monopoly rationale of utilities with respect to the regulation of price and entry. As a result, in many industries the extent of price and entry regulation decreased from the 1970s onwards.[19]

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[14] IEA, 2013, 170.

[15] A natural monopoly is a firm that produces a single homogeneous product and it is less costly to produce this product within a single firm than with two or more firms. There is a cost dominance of this firm that needs to entail the full range of market demand for this product. It is important to that there is no bright line between industries that are "natural monopolies" and those that are considered imperfectly competitive. *See*, Joskow, Paul L., "Regulation of Natural Monopoly," in *Handbook of Law and Economics, vol. 2*, ed. A. Mitchell Polinsky and Steven Shavell (Amsterdam: North-Holland, 2007), 1232, 1248.

[16] Joskow, Paul L., "Electricity Sectors in Transition," *Energy Journal* 19, no. 2 (1998): 25; Joskow, 2007, 1229.

[17] Araral et al, "Regulating Infrastructure: A Review of the Issues, Problems, and Challenges," in *Infrastructure Regulation: What Works, Why, and How Do We Know?: Lessons from Asia and beyond*, ed. Darryl S. L. Jarvis et al (Singapore: World Scientific, 2011), 1.

[18] *See* for an overview of the historical and ideational evolution of the approach to these industrial sectors in the U.S. and EU, Kovacic, William E., and Carl Shapiro, "Antitrust Policy: A Century of Economic and Legal Thinking," *Journal of Economic Perspective* 14, no. 1 (2000): 43–60; Cameron, Peter Duncanson, *Energy Markets: Law and Regulation in the European Union*. Oxford: Oxford University Press, 2002.

[19] Joskow, 2007, 1229.

A process of restructuring or market liberalisation began that eventually led to very divergent outcomes in the power sectors around the world. The main aim of power sector liberalisation was to introduce competition into the sector. In the past, utilities tended to be vertically and often horizontally integrated. Thus, in the power sector the restructuring centred on the unbundling of assets, such as the separation of units that engage in electricity generation, hold and operate network assets, and provide direct services to the customers. The unbundling process aimed to create competitive markets in all business segments. To achieve this goal, various regulatory models emerged. Furthermore, different forms of ownership can exist in liberalised markets.[20]

Most states established sector specific regulators in order to guarantee that independent power producers have impartial and fair network access. New regulations that govern the access to transmission and distribution networks help to ensure competition among power producers.[21] In some jurisdictions, such as the United Kingdom, the first wave of market reforms also aimed to privatise state monopolies.[22] Thus, beginning in the 1980s the traditional structure of the power industry began to change profoundly.[23] During the 1990s, regulatory transformation became an important feature of the power sector in many states. In advanced economies, policymakers kept pushing for market liberalisation of utility sectors. The World Bank promoted similar policies in developing states.[24]

Neoliberal theories held that reliance on market mechanisms would make the provision of electricity more cost-effective. Yet, in real life market models could only partially guide the restructuring process. Consequently, "in many jurisdictions reform has been a start-stop, on again, off again affair, creating hybridized systems with unique characteristics and, as a result, a series of unique problems for effective regulation."[25]

Socio-political circumstances and business-related challenges were mainly responsible for these outcomes. In fact, the creation of well functioning competitive markets for electricity was a politically and technically demanding task.[26] Eventually, liberalisation remained "unfinished" in many places, because governments feared negative social consequences. Moreover, many political leaders were

[20] *See* for an overview of the liberalisation of the electricity sector, Pollitt, Michael G. ,"The Role of Policy in Energy Transitions: Lessons from the Energy Liberalisation Era," *Energy Policy* 50, no. 11 (2012): 128–37; Byrne, John, and Yu-Mi Mun, "Rethinking Reform in the Electricity Sector: Power Liberalisation or Energy Transformation?," in *Electricity Reform: Social and Environmental Challenges* , ed. Njeri Wamukonya (Rosklide: UNEP Riso Centre, 2003), 50–62.
[21] *See* for an overview of these steps, Joskow, 1998, 25–52.
[22] Araral et al, 2011, 1.
[23] Pollitt, Michael G., "The Role of Policy in Energy Transitions: Lessons from the Energy Liberalisation Era," *Energy Policy* 50, no. 11 (2012): 128–9.
[24] *See* for an assessment liberalisation efforts in developing states, Kessides, Ioannis N., *Reforming Infrastructure: Privatisation, Regulation, and Competition*. Washington, DC: World Bank, 2004.
[25] Araral et al, 2011, 4.
[26] Joskow, Paul L., "Lessons Learned from Electricity Market Liberalization," *The Energy Journal* 29, special issue (2008): 36–7.

reluctant to relinquish control of assets and business activities that could help them cross-subsidise crucial constituencies – consumers or employees – who would suffer from unfavourable market developments.[27]

Considerations related to the physical security of the infrastructure and its reliability were also brought forward to justify continued state interference. Generally, the reliability of power sectors is crucial to economic development. Electricity reliability depends on operating and investment decisions that are made at the transmission and generation levels. In many states, these decisions were transferred to "the market," but remained regulated by government. Eventually, power shortages that occurred around the turn of the century reinforced concerns among policymakers that electricity provision should somehow be regulated and/or controlled by the state.[28]

Since none of the states that engaged in the restructuring of the powers sector was able to establish the "perfect" competitive electricity market by the mid-2010s, governments, energy companies, regulators, and consumers had to deal with incompletely liberalised markets.[29] To varying degrees, governments were still able to guide or even interfere with important decisions by market players. Hence, these markets resembled hybrid markets at best.

As of 2016, the map of the global power sectors (*see* figure 5.1) displayed a marked divergence in the degree of liberalisation and notable differences with respect to the main features of their market design. The sectors' characteristics ranged from "unreformed" vertically integrated regulated monopolies in numerous developing states and some former socialist states to competitive wholesale markets with retail competition in advanced economies. Yet, it is important to note that this range was not necessarily a continuum, as liberalisation did not prove to be a uniformly linear process.[30] Instead, in each jurisdiction a power sector emerged that was embedded in a unique regulatory, political, and economic environment. The direction of power sector transformation depended on this environment rather than on textbook guidelines or international imposition, both with respect to the (further) liberalisation and implementation of low-carbon measures.[31]

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[27] Pollitt, 2012, 128–9.

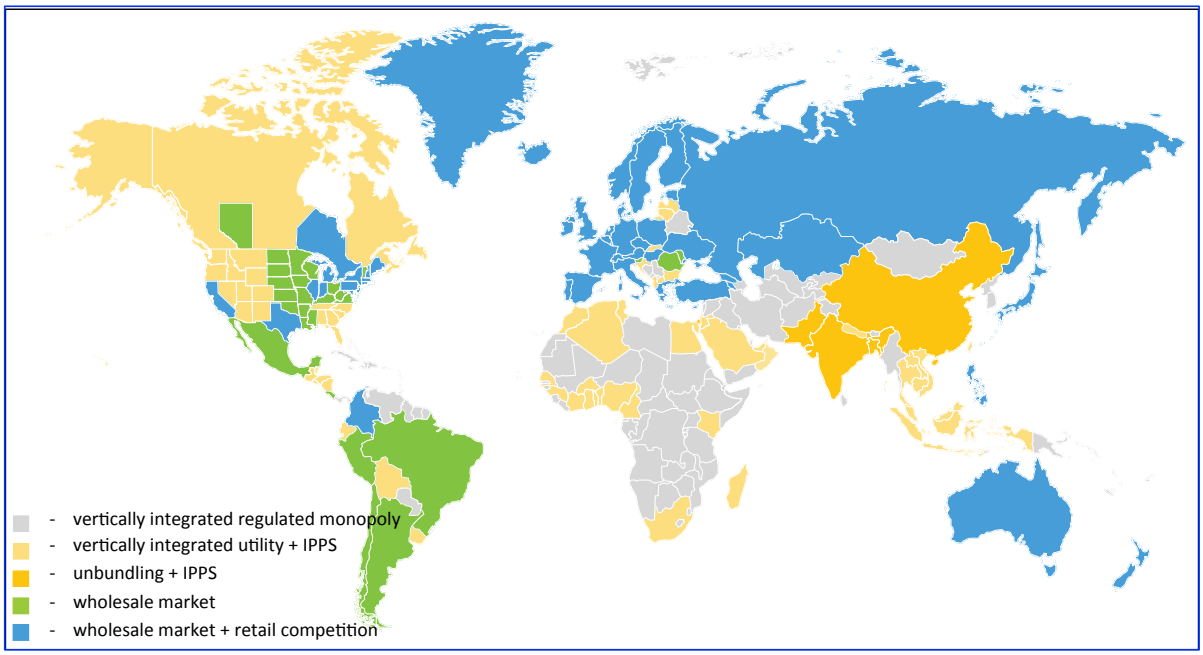
[28] Joskow, 2008, 36–7; Joskow, 1998, 25–52; IEA, *Re-powering Markets: Market Design and Regulation during the Transition to Low-carbon Power Systems*. Paris: OECD/IEA, 2016b, 17.

[29] Many governments pursued the liberalisation of the power sector very slowly and hesitantly. Some even moved backwards after initial problems. Others seek to interfere in the power sector to implement environmental policies. *See*, Pollitt, 2012, 130; Joskow, 2008, 10; IEA, 2016b, 15.

[30] Araral et al, 2011, 12; Politt, 2012, 129.

[31] *See* for an overview of historical energy transitions from 1500 to 1920, Fouquet, Roger, "The Slow Search for Solutions: Lessons from Historical Energy Transitions by Sector and Service," *Energy Policy* 38 (2010): 6586–96.

Figure 5.1: Mapping the state of liberalisation (IPPs = independent power producers), 2016



***Source*: IEA, 2016 (online), p. 23.**

5.2.2. Responding to changing markets and global warming

Ever since the beginning of the market reforms, the great transformation that the electricity sector experienced has been shaping the implementation of new policies to guide the sector's development. This is particularly true for the low-carbon transition of the sector. By changing the economic environment wherein they operated, the liberalisation policies primarily affected the position of incumbent market players – i.e. large utilities and network operators. However, the unbundling of network assets and power generation also created opportunities for new actors and altered relations within the sector. The decarbonisation of the electricity sector thus unfolded against the backdrop of hybrid and volatile sectoral norms and institutions.

Putting the low-carbon transition of the energy system into historical perspective is useful, mainly because observations from previous energy transitions [32] help to understand this transformation. Given its interactions with countless other policy fields the core of the low-carbon energy transition is often hard to fathom. Like some previous instances of energy transitions,[33] the

[32] Baritaud, Manuel, "From Deregulation to Decarbonisation of the Electricity Sector," in *Electricity in a Climate-constrained World: Data and Analyses*, ed Richard Baron and Joãa Lampreia (Paris: OECD/IEA, 2013), 33–8.

[33] Examples are the replacement of residential coal use with gas for heating and cooking or the shift from sailing ships to steam power for sea transport. Energy transitions differed with respect to supplies and services (heating, lighting, transport). *See* Fouquet, 2010, 6591.

decarbonisation of energy generation primarily involves the shift from one fuel to another. The aim is to replace fossil fuels – coal, oil, and natural gas – with non-carbon fuels. In the case of the electricity sector, this could be achieved by switching to various forms of renewable energy sources. Take, for instance, wind, solar or biomass. Other non-carbon energy sources would be hydropower or nuclear power.

During previous energy transitions – such as the replacement of coal by oil in the transport sector during the first half of the 20th century – economic benefits of new fuels were driving the transition. Thus, energy transitions occurred whenever new fuels could supply cheaper and/or better energy services.[34] The low-carbon transition, however, was instigated because fossil fuels had to be replaced based on broad environmental concerns, including air pollution and the threat of climate change. In this case, the choice for new fuels is not based on a cost-benefit analysis. In fact, compared to coal the use of renewables cannot be justified from an economic perspective, albeit if environmental externalities are not counted. At least during its early phase, government interference, especially financial support, was necessary to implement policies in order to promote the low-carbon transition. Thus, from the outset the decarbonisation was characterised by a strong role for government intervention. It is a "governed energy transition."[35]

By the mid-2010s, the main actors in the electricity business were power producers, companies that administered transmission and distribution networks (system operators), and independent regulators.[36] In addition, the low-carbon transition was shaped by policymakers at different administrative levels, electricity-consuming businesses and their representatives, and civil society.[37] These actors were key to the implementation of new sector-specific policies. Depending on the political, economic, and regulatory environment, the position and concerns of these actors set the parameters that determined the policymakers' room for manoeuvre when they were drafting and implementing low-carbon policies. To varying degrees, consumer interests and societal preferences also influenced the decision-making process.[38]

By the late 1990s, the actors in the power sector faced a fast-changing global energy landscape. Price developments determined fuel choices and general investment prospects. Huge investments

[34] Ibid., 6595.
[35] Kern, Florian, and Karoline Rogge, "The Pace of Governed Energy Transitions: Agency, International Dynamics and the Global Paris Agreement Accelerating Decarbonisation Processes?," *Energy Research and Social Sciences* 22 (2016): 14; *see* also on the nature of the low-carbon transition as a governed transition, section 6.5. of chapter six.
[36] Since promoting competition in the supply of generation services was the main objective of the restructuring of power sectors, independent regulators should ensure that both consumer interests and those of private investors would be protected. *See*, Joskow, 1998, 25–52.
[37] Kern and Rogge, 14.
[38] Baritaud, 2013, 33–8.

were necessary in order to replace aging facilities and to accomplish the sector's decarbonisation.[39] Thus, the power sector's attractiveness for investors was crucial. The regulatory environment of individual electricity sectors emerged as an important determinant of its attractiveness. Therefore, the capability to maintain the security of power supply during the low-carbon transition depended on regulatory innovation and sufficient financing.[40]

During the first decade of the 21st century, low-carbon measures were niche operations, electricity and climate policies were still developed separately in most states.[41] Yet, coordinating these policy fields became ever more vital. The divergence with respect to the state of liberalisation in different power sectors required a tailor-made approach to the planning, financing, and implementation of low-carbon measures in order to take into account specific local regulatory and institutional circumstances. The situation varied from state to state and sometimes even within states. Thus, the outcome of liberalisation policies shaped the design of climate policies, including the goals, time schedules, and regulatory instruments. Since the market liberalisation of the sector was still ongoing, policymakers faced the complex and capricious task of simultaneously designing regulation for the restructuring of the power sector and the sector's decarbonisation. Above all, the integration of renewable energy sources required extra measures in order to ensure the security of power supply, which resulted in additional costs.[42]

In order to "prepare" for decarbonisation, the power sector had to endure just another major overhaul of its regulatory framework. The IEA concludes that following the restructuring of the power sector electricity markets in many states became (more) open to competition. Yet, market mechanisms were designed for an electricity system based on huge fossil-fuel based power plants. Therefore, the existing market design was largely unable to deliver cost-effective low-carbon investments.[43] The market mechanisms had to be refitted in order to attract and facilitate low-carbon investments, in particular the deployment of renewable energy sources.[44]

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[39] In its New Policies Scenario (based on policy commitments and plan that have already been announced by states), the IEA estimated that in the period from 2014 to 2040, about U.S.$51 trillion of investment would be made in the global energy sector. The power sector accounted for U.S.$20.8 trillion in this estimation. About 58% of this cumulative investment would finance the construction of new power plants and refurbishing existing ones. The remaining investment would go to networks – in total U.S.$8.7 trillion. International Energy Agency (IEA), *World Energy Outlook 2014*. Paris: OECD/IEA, 2014(e), pp. 84–5, 218.

[40] IEA, 2016b, 28–9, 33.

[41] The EU legislation for electricity sector reform and climate change mitigation is a case in point. The liberalisation directives were enacted in 1996 and 2003. Only from 2009 onwards, EU climate policies gradually converged with the Union's energy legislation. *See* further section 5.3.

[42] International Energy Agency (IEA), *World Energy Outlook 2011*. Paris: OECD/IEA, 2011, 190.

[43] IEA, 2016b, 17.

[44] By that time, power generated from the renewables was not yet competitive. Governments had to design support measures in order to attract investors. *See* for a brief overview of the forecast and investment situation at the time, International Energy Agency (IEA), *World Energy Outlook 2010*. Paris: OECD/IEA, 2010, 426–8.

An essential aspect of the energy transition was the issue of security of electricity supply. This concept points to the level of supply security that society expected. It goes without saying that during the transition from high-carbon to low-carbon power generation the pre-existing level of security of power supply had to be maintained. This objective in itself constituted a big challenge for policymakers and practitioners. Balancing the policy goals of using clean energy and ensuring energy security proved difficult.[45] This issue points to the close link between power supply and technological advances, including the digitalisation of the sector, the introduction of smart grids, and shifting roles of electricity producers and consumers in the context of power distribution.[46]

Electricity demand is very volatile and elastic to short-term price hikes. In addition, electricity can only be transported via a grid; and supply and demand must be balanced in real time. By the mid-2010s, it was not yet possible to store electric power at reasonable costs in very large quantities. These features distinguish electricity from other commodities and, at that time, still determined the market design.[47]

The integration of variable or intermittent renewable energy sources such as wind and solar power generally changed the operation of fossil-fuel based power systems, mainly because the operators have to balance new variable supplies depending on weather circumstances.[48] Their deployment could only be regulated with innovative policies and regulatory designs. If regulatory regimes, market design, and system operators are unable to keep up with advanced technologies, the deployment of such technologies will eventually endanger both the security of electricity supply and the progress of decarbonisation.[49]

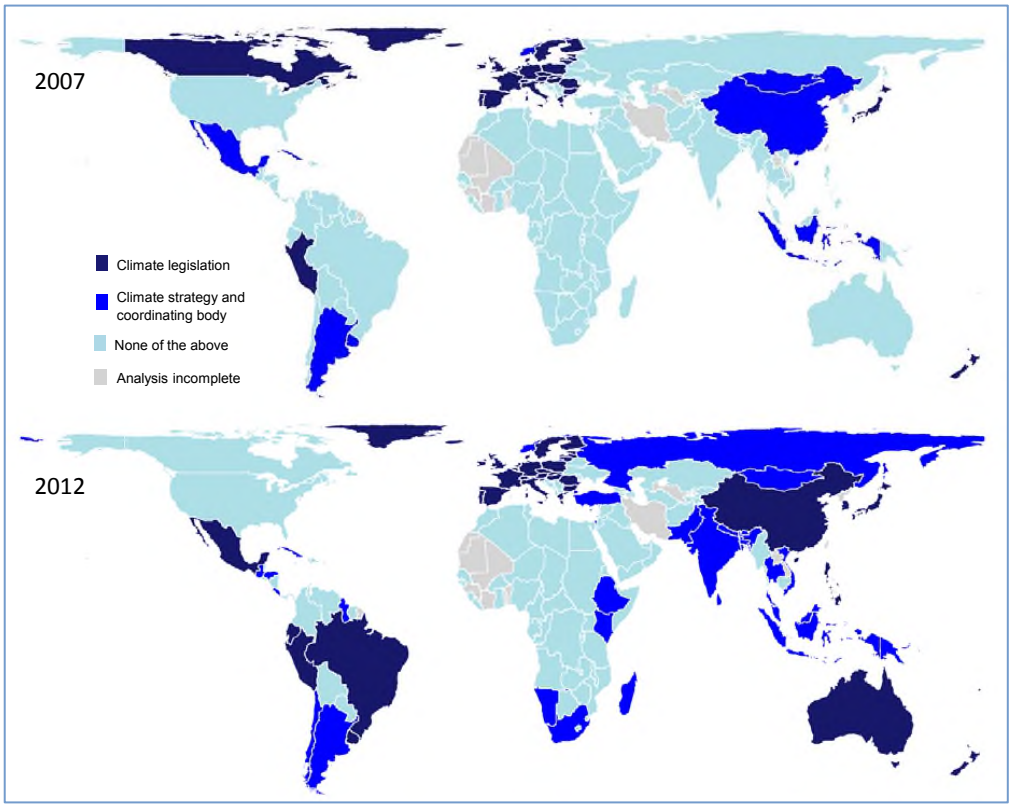
Finding solutions to this challenging task became a global quest. Figure 5.2 illustrates the increase in national and federal climate legislation and policies worldwide from 2007 to 2012.[50] By the end of 2014, 99 states had enacted more than 800 domestic climate change laws and policies that covered 93% of global anthropogenic greenhouse gas emissions. In 86 states, laws and policies encouraged energy conservation. This impressive number of laws and policies clearly represented a larger trend. In fact, since 1997 the number of climate laws and policies had doubled every five years. More than half of these laws and policies concerned the energy sector, primarily covering electricity and heat supply. Legislation and policies to regulate carbon prices could be found in 39 states; and 89

[45] IEA, 2016b, 3.
[46] Agrell, Per J., Peter Bogetoft, and Misja Mikkers, "Smart-grid Investments, Regulation and Organization," *Energy Policy* 52 (2013): 656–66.
[47] IEA, 2016b, 45.
[48] International Energy Agency (IEA), *Harnessing Variable Renewables: A Guide to the Balancing Challenge*. Paris: OECD/IEA, 2011, 31–3.
[49] IEA, 2016b, 3.
[50] Figure 5.2 only shows legislation and policies at the national level. It omits the various regulatory measures that had already been adopted by federal states in the U.S. *See* also section 5.3.

states had implemented laws and policies to promote low-carbon energy sources.[51] Thus, during the early 2010s climate measures, especially in the electricity sector, had become a global trend.

Figure 5.2. depicts the geographical distribution of domestic climate laws and policies. The increase in the quantity of legislative measures between 2007 and 2012 is remarkable. Yet, it is even more important that by 2012 many states that initially only had climate policies and a governmental body, which coordinated climate measures, had moved to passing laws that specifically addressed climate change.[52]

Figure 5.2: Domestic climate legislation and policies at the national or federal level, 2007–2012



***Source*: Dubash, 2013, 656.**

[51] Nachmany, Michal et al, "The 2015 Global Climate Legislation Study: A Review of Climate Change Legislation in 99 Countries – Summary for Policy-makers," Grantham Research Institute on Climate Change and the Environment," 2015, http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2015/05/Global_climate_legislation_study_20151.pdf, pp. 12, 29; "The Global Climate Legislation Study: Summary of Key Trends 2016," November 2016, http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2016/11/The-Global-Climate-Legislation-Study_2016-update.pdf, pp. 3, 4.

[52] Dubash et al, "Developments in National Climate Change Mitigation Legislation and Strategy," *Climate Policy* 13, no. 6 (2013): 659.

Initially, the path to decarbonisation was presented as two almost mutually exclusive choices – i.e. either establishing wholesale electricity markets with a strong carbon price or implementing technology-specific policies and regulation, such as support schemes for certain renewables. However, better insights into the practicability of these policies and the urgency to reduce carbon emissions led to the conclusion that a combination of these instruments was required. A cost-effective low-carbon transition apparently required a combination of carbon pricing and support policies for renewables in a consistent electricity market framework.[53] Yet, in order to ensure the realisation of the desired outcomes it was vital to constantly re-evaluate the interaction of these different policies.[54]

In addition, cross-regional interconnection of electricity markets was identified as a means to limit the amount of investments in new conventional generation capacity that would be needed to balance power systems with high shares of intermittent renewables. Interconnection, however, depended on the question of whether the needs of areas that should be interconnected generally coincided. If the supply patterns are similar, interconnection is no option.[55]

A combination of reform measures was key to the decarbonisation of the power sector. Given the necessity to design new policies and regulations to accomplish the transition, the state once again played a vital role in the electricity sector's governance. Market mechanism were not able to accomplish the necessary steps in a timely manner. Consequently, the electricity sector remained heavily regulated, especially with respect to the fuel mix used to generate electricity and cross-regional – or even cross-border – grid infrastructure.[56] A closer look at carbon pricing mechanisms, regulatory designs to support the deployment of renewables, and mechanisms to enable the inter-connection of neighbouring power systems is warranted to grasp the scope of the efforts that were needed to begin and further regulate the decarbonisation of electricity generation.

5.2.2.1. Carbon prices and low-carbon investments

In the electricity sector, carbon prices are supposed to shape economic choices of investors, technology developers, and consumers. The rationale for introducing a carbon price was based on

[53] IEA, 2016b, 11.
[54] *See* for an assessment of negative interactions between different policy approaches, Del Río, Pablo, and Emilio Cerdá, "The Missing Link: The Influence of Instruments and Design Features on the Interactions between Climate and Renewable Electricity Policies," *Energy Research and Social Science* 33 (2017): 49–58.
[55] IEA, 2016b, 173, IEA, 2011a, 53.
[56] Some form of government involvement is vital to determine the design of markets and set up monitoring authorities. See, Doorman, Gerard L., and Reinier van der Veen, "An Analysis of Design Options for Markets for Cross-border Balancing of Electricty," *Utilities Policy* (2013): 39–48; IEA, 2016b, 18.

the fact that during the initial period of decarbonisation the generation of power from low-carbon sources would prove to be economically inferior to the use of fossil fuels. In the absence of a carbon price, low-carbon technologies were generally more expensive than natural gas or coal. A high carbon price would corresponded to a textbook approach of correcting an environmental externality. It would make the use of fossil fuels more expensive. Thus, a sufficiently high carbon price would subsequently affect energy demand, deter new high-carbon investments, and curtail the operation of existing high-emitting assets.[57]

Initially, many policymakers favoured a high carbon price to promote decarbonisation. Carbon taxes or cap-and-trade emissions markets were introduced to correct the climate externalities of fossil-fuel based power generation. However, in the case of the power sector it was feared that proceeding with this approach might eventually result in a significant increase in electricity prices – carbon prices in addition to very high and volatile wholesale prices. In most states, such a price rise was politically infeasible.[58]

The reason for this lies in the nature of carbon taxes. They unevenly affect poor people. Vulnerable segments of society are often unable to adjust their energy consumption patterns, in order to avoid higher costs. In those places where carbon prices were introduced, policymakers were forced to make some considerable trade-offs. As a result, carbon prices were generally not high enough to deliver their potential.[59] Fossil-fuel based electricity remained relatively competitive.

At the beginning of decarbonisation, the debate about long-term market designs was marked by a high degree of uncertainty. Therefore, markets had to be designed to foster the inclusion of all available technologies. This would ensure sufficient level of flexibility with respect to the availability and acceptability of certain technologies in the future. Thus, an appropriate market design needed to conceptualise the low-carbon transition as an evolutionary process. The design had to be able to attract low-carbon investments during an initial period of about 15 years and take into account the prevailing characteristics of the electricity sector in question, especially the state of liberalisation and geographical features.[60]

The investment environment of the power sector proved to be unfavourable in many states when the initial decarbonisation measures were taken. The IEA identified four factors that were

[57] IEA, 2016d, 43.
[58] IEA, 2016b, 44; *see* on carbon taxes, Andrew, Jane, Mary A. Kaidonis, and Brian Andrew, "Carbon Tax: Challenging Neoliberal Solutions to Climate Change," *Critical Perspectives on Accounting* 27 (2010): 611–8.
[59] IEA, 2016d, 43.
[60] This relates to weather patterns as well as the possibility to establish offshore wind farms or onshore wind farms on mountain ranges as well as to the population density of rural areas. *See* on the spatial matters related to the energy transition, Huber, Matthew, "Theorizing Energy Geographies," *Geography Compass* 9, no. 6 (2015): 327–37; IEA, 2016b, 53.

responsible for this situation. First, wholesale market prices for electricity were too low during the first decade of the 21st century. Overcapacity hampered investments in efficient low-carbon generation. Second, investment strategies of utilities had changed markedly since the commencement of the power market liberalisation. Market players were reluctant to make long-term investment decisions in what was perceived as an uncertain market environment. Moreover, at that time institutional investors also refrained from financing energy infrastructure despite the fact that they formed a large source of potential funding. Installations for renewable energy sources were usually realised through project finance.

Third, prices for fossil fuels, especially natural gas and coal, developed very unpredictably after the 2008 global financial crisis. Therefore, a very high carbon price would have been needed to realise low-carbon investments that were exposed to volatile gas and coal prices. As already mentioned, in most states an increase in electricity prices was politically and economically unfeasible. Fourth, carbon prices were too low to induce investment decisions. It was economically not viable; and potential investors deplored a lack of political commitment. Thus, carbon pricing could not deliver sufficient investments, while the political debate about the issue further contributed to a sense of opaqueness with regard to this policy instrument. Hence, under these circumstances additional policy intervention was necessary in order to attract low-carbon investments while keeping financing costs low.[61]

Investments to deploy new low-carbon technologies required further government measures, such as long-term power purchase agreements. Such agreements helped insulate investors from the development of electricity market prices. Yet, this two-pronged approach seemed to be prone to result in a split electricity market – i.e. a heavily regulated market for low-carbon electricity and a competitive market for electricity generated based on fossil fuels and "traditional" low-carbon technologies such as nuclear and hydropower. The fragmentation of the market would then lead to tensions between the two segments and even more complexity.[62] Investment decisions under such conditions required long-term government support. Under these circumstances, governments had to take measures in order to increase the predictability of future revenues and show more political commitment to the energy transition. Bridging the cost gap between low-carbon technologies and

[61] IEA, 2016b, 54–9; *see* for an overview of the investment situation regarding renewable electricity during the mid-2010s, International Energy Agency (IEA), *Renewable Energy: Medium-term Market Report 2015*. Paris: OECD/IEA, 2015, 203–14.
[62] IEA, 2016b, 44.

fossil-fuel based power generation seemed to be insufficient to begin and promote the low-carbon transition of the electricity sector.[63]

Several support options for renewables have evolved since the late 1990s. Generally, government support instruments aimed to reduce the risk that low-carbon investors faced. Standard feed-in tariffs[64] helped to make future prices predictable and guaranteed sales volumes, while imbalance costs were socialised – i.e. borne by end consumers. They belonged to the first category of support instruments. Variable premium systems were shared-risk instruments. They were based on standardised, long-term power purchase agreements. Under this scheme, the power generator sold directly to the market and had to bear the imbalance risk, which distinguished this instrument from feed-in tariffs. If prices would fall lower than a predetermined price, the investor received compensation to equal the predetermined price.[65]

Under other schemes, investors faced the full set of market risks. These instruments included direct cash grants, rebates, and tax incentives, and were labelled as subsidies on top of market revenues or market plus subsidies. They helped reduce the cost of low-carbon energy projects for investors. Fixed market premiums complemented the revenues that were generated on the conventional electricity market. Investors thus received a fixed premium depending on the amount of electricity that they generated. These premiums then supplemented their market revenues.[66]

Modulated premiums constituted intermediate approaches between fixed-price instruments and market plus subsidies, because they divided risks between actors. They exposed low-carbon electricity generators to some but not all electricity market risks. Their deployment helped to fine-tune the degree of risk that low-carbon investors faced. Since long-term prices on power markets constituted the greatest risk for investors, regulators had to focus on two matters. First, they needed to find a way to determine the level of risk that low-carbon power generators could bear. Second, they had to provide sufficient certainty about the development of the market to keep financing costs low.[67]

Arguably, these instruments constituted forward-looking innovations. However, under frequently changing market conditions regular adjustments of the enacted instruments was

[63] *See*, Badcock, Jeremy, and Manfred Lenzen, "Subsidies for Electricity-generating Technologies: A Review," *Energy Policy* 38, no. 9 (2010): 5038–47; Reichenbach, Johanna, and Till Requate, "Subsidies for Renewable Energies in the Presence of Learning Effects and Market Power," *Resource and Energy Economics* 34, no. 2 (2012): 236–54; IEA, 2016b, 59.
[64] Feed-in tariffs are fixed electricity prices that producers of renewable electricity receive, based on long-term contracts (usually 15 to 20 years) and their production costs. *See* for this and other policy instruments to incentivise investments in renewables, International Energy Agency (IEA). *World Energy Outlook 2010*. Paris: OECD/IEA, 2010, 312–21.
[65] IEA, 2016b, 60–1.
[66] Ibid., 61.
[67] Ibid., 60, 63.

inevitable. Most of these policies instruments did not live up to their full potential. It goes beyond the scope of this study to examine their various deficiencies. Essentially, from the outset liberalised electricity markets were unable to convey market price signals that would stimulate investment levels that were sufficiently high to ensure adequate generation capacity.[68] Another issue that hampered the deployment of renewables was the lack of transmission capacity, which is required to balance intermittent electricity supplies that originate from wind or solar power and are thus affected by changing weather conditions.

5.2.2.2. Transmission and regional interconnection

During the first decade of the 21st century, the growing use of wind and solar power increased the share of intermittent electricity supply in many states. In order to balance variable power supplies from these sources, conventional power generators had to be deployed. One way to fulfil this balancing function could have been the construction of new conventional generation capacity. Another more cost-effective alternative was the expansion of transmission grids and the cross-regional interconnection of grids to extend the geographical reach to balance power flows with regions that are further away.[69] Still, the scale of investment that was required for expanding electricity networks was similar to the amount of financing, which was needed for the deployment of renewables.[70] Moreover, this approach generally involved cross-border transactions. Consequently, to facilitate cooperation across jurisdictional borders efforts to coordinate generation patterns and network development plans became ever more important.[71] New rules and institutions were needed to facilitate new forms of cooperation and to overcome multiple challenges to the expansion of the grids.

Networks are key to ensuring the security of electricity supply and cost-efficiency of the power system. The policy fields of decarbonisation and security of energy supply and social acceptance issues interact particularly strongly in the context of transmission and distribution network planning.

[68] International Energy Agency (IEA). *The Power of Transformation: Wind, Sun and the Economics of Flexible Power Systems*. Paris: OECD/IEA, 2014(c), 176.

[69] A greater geographic extent of the grid helps to connect regions with different weather patterns or fuel mixes. Take, for instance, a region with a large share of wind and solar power and one with many hydropower stations. *See* for an overview of the costs and challenges related to the integration of variable renewables into power transmission networks, IEA, 2010, 321–8; *see* for the need to interconnect regions with different characteristics to achieve the balancing effect, IEA, 2011, 53.

[70] Without making any changes to the energy mix of the mid-2010s and just maintaining the supply levels, the IEA estimated that investments required for power generation until 2035 would amount to U.S.$9.6 trillion. The largest sum – about U.S.$6 trillion – would be spent on renewables deployment. Investments in the transmission and distribution networks would require another U.S.$6.8 trillion. *See*, IEA, *World Energy Investment Outlook 2014*. Paris: OECD/IEA, 2014(d), 26–7, 105–4; IEA, 2016b, 173.

[71] *See*, Kucsera, Dénes, and Margarethe Rammerstorfer, "Regulation and Grid Expansion Investment with Increased Penetration of Renewable Generation," *Resource and Energy Economics* 37 (2014): 184–200; IEA, 2016b, 173.

Furthermore, in developed states the expansion of networks usually took six to ten years with regard to domestic projects, mainly because of permitting and licensing procedures.[72] The interconnection of larger regions across borders was an even bigger challenge.

By the mid-2010s, three main challenges shaped the debate. First, governments and regulators were usually only responsible for market regulation at the national level or were restricted to a federal state or province. Some form of institutionalised cross-border cooperation was necessary to utilise interconnectors. Second, investors who sought to improve interconnections between different jurisdictions had to overcome regulatory and institutional differences to integrate the electricity markets in question. The economics of market integration were not always favourable for all participants, as electricity prices could rise in exporting economies. Uncertainty about the socio-economic consequences of market integration formed a considerable barrier to more interconnections. Therefore, the design of agreements and rules, aiming to promote market integration, had to take into account distributive impacts for consumers and producers in all participating locations.[73]

A third issue are the social and environmental impacts of cross-border and inter-regional transmission lines that should not be ignored. In some jurisdictions, the population was very likely to succeed in requiring more expensive underground transmission lines, based on concerns over health issues, agricultural yields or falling real-estate prices. However, similar concerns were raised against underground cables. In the debate about the Südlink transmission line in Germany, the announcement of the route was met with howls of protest.[74] More often than not, the time and money that such demands involved, including administrative and court proceedings, increased the costs of vital interconnection projects.

However, a valid argument against long transmissions lines is the demand, usually voiced in developed states, that electricity should be produced locally, by a variety of providers. This also relates to the control of the infrastructure by local communities, transparency, and democratic

[72] IEA, 2016b, 174, 173.

[73] Ibid., 183; see also on the management of stable networks, including regional cooperation, Boot, Pieter, Jacques de Jong, and Nico Hoogervorst, "Reflections on Coordination Mechanisms: For Accommodating Increasing Amounts of Wind and Solar in the Power Market," CIEP/PBL Report, no. 5 (2014), http://www.clingendaelenergy.com/inc/upload/files/ Ciep_paper_2014-05_web.pdf, pp. 45–66, 67–74.

[74] In Germany, 700 kilometres of transmission lines had to be built in order to transport renewable electricity from the northern parts of the country to industrial areas in the south. Numerous local protest movements emerged, as soon as the route of the so-called Südlink transmission line was made public. Some demanded to have laid underground cables, others opposed such cables, especially farming communities. *See*, Fittkau, Ludger, "Die Kabel kommen unter die Erde" [The cables go underground], *Deutschlandfunk*, 5 December 2015, https://www.deutschlandfunk.de/diskussion-um-suedlink-die-kabel-kommen-unter-die-erde.724.de.html?dram:article_id=338931; https://www.tagesschau.de/inland/suedlink-protest-103.html.

decision-making about the development of electricity supply.[75] These and other societal and environmental debates often delayed the completion of projects to link electricity markets for years.

For accomplishing large-scale interconnection projects, regional planning and information sharing was also a prerequisite. The integration and interconnection of vast regions simultaneously was a combination of bottom-up and top-down processes to address the complexity of the task. Specialists "on the ground" with detailed geographic and technical knowledge participated in drafting local or regional transmission plans, while a central body usually identified feasible inter-regional lines. To decide on the most favourable options, planners needed to consider the energy policies of the regions that wanted to link their electricity grids. It was necessary to examine load patterns, in order to determine whether the regions that would be interconnected had compatible supply patterns. Take, for instance, the interconnection of a region with a large capacity of wind and solar power and neighbouring region with considerable nuclear power capacity. Both regions would profit from an interconnection, consuming renewable energy when it is available, while the nuclear plants balance supply and demand when the weather is less favourable. Accordingly, interconnection plans needed to touch upon both regions' preferred technologies, and their strategies for future fuel mixes in the electricity generation. These plans involved long-term decisions, mainly because the infrastructure was expected to have a lifespan of 40 to 60 years.[76] Hence, forward-looking agreements between national and subnational governments, including power sector regulators, as well as adaptable power sector laws and regulations were necessary to create an institutional and regulatory environment in which market actors would be willing to opt for long-term engagements.

By the mid-2010s, the ongoing restructuring of the power sector and its decarbonisation required a comprehensive and highly flexible regulatory approach at national and subnational levels. It was generally expected that low-carbon technologies would need government support for many years to come. Large amounts of investments were needed to construct and refurbish the grid infrastructure. Furthermore, the level of market liberalisation in participating power sectors determined the prospects of market-based revenues for low-carbon electricity. The next section examines how the interrelationship between the power market restructuring and low-carbon transition evolved in jurisdictions that, given the size of their energy sectors, were the three biggest global emitters of CO_2 by the mid-2010s.

[75] Haleakala-Stiftung, "Vor-Ort-Strom: Wege zur Dezentralisierung der Stromversorgung" [Locally produced electricity: Ways to decentralise electricity supply], June 2017, https://www.haleakala-stiftung.de/vor-ort-strom/, pp. 1–46.
[76] IEA, 2016b, 184–7.

5.3. Big emitters' legislation

In 2014, global energy-related CO_2 emissions rose to 32,381 million metric tonnes. The EU, U.S., and China were responsible for more than half of these emissions. China was by far the largest emitter with 8,744 million metric tonnes of CO_2, which was 27% of all global CO_2 emissions that were caused by the production of energy. The U.S. came second with 5,412 million metric tonnes (16.7% of the global total); and the 28 member states of the EU emitted 3,462 million metric tonnes (10.7%).[77] Therefore, the success of low-carbon policies and regulation in these three entities were key to global decarbonisation efforts. This section focuses on the regulation of power generation in the three jurisdictions and explains how climate policies and the regulation of the power sector had shaped the decarbonisation paths of these actors prior to the adoption of the Paris Agreement.

5.3.1. Power market liberalisation

The geographies, histories, and resulting structures of the power sectors of the EU, the U.S., and China differ greatly.[78] By the mid-2010s, almost all EU member states had wholesale power markets with retail competition. In China, independent power producers were active in an unbundled power sector. Yet, all big companies in the Chinese electricity sector continued to be state-owned enterprises. In the U.S., Texas also chose for establishing a wholesale market with retail competition, while several federal states in the west of the country relied on independent power producers and vertically integrated utilities. In the Midwest, utilities were unbundled; and independent producers generated electricity. In the eastern part of the U.S., all three structural forms existed. The following subsections discuss the liberalisation of the electricity sectors in the EU, U.S., and China from a historical perspective, starting with the U.S., as the liberalisation of the electricity sector began there in the late 1970s. The EU and China started implementing power sector reforms during the 1990s.

5.3.1.1. United States

The United States spearheaded the global switch to restructure the electricity business. In the late 1970s, the Carter Administration (1977–81) not only began to introduce competition in the power sector but also proposed changes across all components of the energy sector. With the adoption of

[77] *See*, IEA, "Key World Energy Statistics – 2016," 2016, p. 45; U.S. Energy Information Administration, "International Energy Statistics," http://www.eia.gov/beta/international/data/browser/#.
[78] *Cf*. figure 1 at p. 10.

the National Energy Act (NEA) in 1978, the U.S. government responded to the 1973 energy crisis that had caused severe price hikes, especially for oil.[79]

The NEA consists of several acts – i.e. the Public Utility Regulatory Policies Act (PURPA), Energy Tax Act, National Energy Conservation Policy Act (NECPA), Power Plant and Industrial Fuel Use Act, and Natural Gas Policy Act. With respect to electricity sector reform, PURPA[80] is the most relevant law. It incorporates retail rate regulations for electric utilities and contains provisions to interconnect transmission services.[81] Most importantly, PURPA created a new regulatory framework that allowed independent power producers to enter the market.[82] This provision was significant, as it initiated the departure from the industry's traditionally vertically integrated structures. It thus introduced competition to the power industry.[83] Throughout the 1980s, the developments under this framework showed "the feasibility of a competitive generation sector in the electric power industry."[84] In addition, PURPA instituted a salient but testing interrelationship between the federal and state levels that centred on the competence to regulate the power sector.[85] Still, NEA, especially PURPA, paved the way for a competitive wholesale power market, which the 1992 Energy Policy Act (EPAct92)[86] further refined.[87]

When EPAct92 was passed, commentators described it as a "landmark" in energy legislation that would change the U.S. electricity industry forever.[88] EPAct92 abandoned the notion that the electricity sector was exclusively or preferably structured around the traditional, vertically integrated power utility. EPAct92 embraced a competitive power generation market as the new model for the power industry.[89] Its core provision was Section 32 that defined the role and function of "exempt wholesale generators"[90] and allowed new players to enter the market. The segment of independent

[79] Despite the fact that President Jimmy Carter's 1977 National Energy Plan and the oil price rises after the 1973 OPEC embargo were the backdrop of the debate, the NEA did not amend oil price and allocation programmes that were already in place. It mainly addressed other components of the energy sector. *See*, Richardson, Julia, and Robert Nordhaus, "The National Energy Act of 1978," *Natural Resources and Environment* 10, no. 1 (1995): 62–3.
[80] Public Law 95-617.
[81] Richardson and Nordhaus, 1995, 65.
[82] *See* Section 210 of PURPA.
[83] Dennis, Jeffery S., "Twenty-five Years of Electricity Law, Policy, and Regulation: A Look back," *Natural Resources and Environment* 25, no. 1 (2010): 34; *see* also, Cudahy, Richard D., "PURPA: The Intersection of Competition and Regulatory Policy," *Energy Law Journal* 16, no. 2 (1995): 419–39.
[84] Richardson and Nordhaus, 1995, 66.
[85] *See* for a discussion of the dynamics that evolved between the federal and state levels, Miller Jr, John T., "Conscripting State Regulatory Authorities in a Federal Electric Rate Regulatory Scheme: A Goal of PURPA Partially Realized," *Energy Law Journal* 4, no. 1 (1983): 77–84.
[86] Public Law 102-486.
[87] Richardson and Nordhaus, 1995, 88.
[88] Stuntz, Linda G., "The Energy Policy Act of 1992: Changing the Electricity Industry," *Natural Resources and Environment* 10, no. 1 (1995): 69.
[89] Ibid.
[90] Exempt wholesale generators are independent power producers (IPPs). They sell the electricity that they produce exclusively to wholesale customers. They are exempt from some requirements pursuant the 1938 Public Utilities Holding Company Act, subsequently the 2005 Public Utilities Holding Company Act.

power producers grew considerably,[91] as EPAct92 extended their accessible markets by opening transmission facilities to third parties.

The increasingly divided jurisdiction over electricity was another important development during that period. Congress did not detail the institutional framework of the new market relations in EPAct92. It left this task to the Federal Energy Regulatory Commission (FERC).[92] Accordingly, FERC obtained jurisdiction over the transmission and wholesale of electricity in interstate transactions.[93] State public utility commissions continued to be responsible for the retail business, while FREC started to regulate the interstate transmission of electricity.[94] This situation posed an enormous challenge to FERC and regulators in the federal states.[95]

After the rather eventful phase of electricity industry restructuring from the early 1990s until 2005, the organisational features of the power sector remained largely the same, while environmental externalities became more prominent in follow-up legislation,[96] such as the 2005 Energy Policy Act.[97] Together with related laws that concern the power sector, the 2005 Energy Policy Act re-emphasised trends,[98] which have characterised the U.S. power sector since the late 1970s. These trends were the ongoing restructuring of the sector, increased competition, and an ever more influential role of federal authorities in electricity regulation and policy.[99] When the most essential part of the liberalisation process had already been accomplished in the U.S., the EU still struggled with its initial legislative steps. The next subsection discusses the liberalisation of the EU electricity market.

5.3.1.2. European Union

The reform of the European power sector began in the mid-1990s with the enactment of Directive 96/92/EC.[100] From the outset, this reform was a two-pronged effort. First, the restructuring sought to introduce competition in the power sector across borders. Second, and inherently related to the first

[91] Dennis, 2010, 35.
[92] The 1978 Federal Power Act established the legal authority of the Federal Energy Regulatory Commission. Its predecessor was the Federal Power Commission.
[93] Federal states maintain the authority over facilities used for the generation of electricity and facilities used for local distribution of electricity, 16 U.S.C. § 824 (b) (1). FERC does not have jurisdiction over some matters within state authority.
[94] Dennis, 2010, 33.
[95] Stuntz, 1995, 70.
[96] Borenstein, Severin, and James Bushnell, "The U.S. Electricity Industry after 20 Years of Restructuring," Energy Institute at Haas Working Paper no. 252, May 2015, https://ei.haas.berkeley.edu/research/papers/WP252.pdf, p. 20.
[97] Public Law 109-58.
[98] Dennis, 2010, 35.
[99] Ibid., 33–8.
[100] Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity, OJ L 27, 30.1.1997, pp. 20–29.

objective, the directive aimed to establish a single European energy market. It thus realised the vision that was communicated by the Single European Act[101] and the 1988 working document of the European Commission on the internal energy market.[102] Subsequently, legislation was drafted to implement the internal energy market. However, this process was delayed by the geopolitical shifts in Europe following the collapse the communist dictatorships in 1989, and in particular by the reunification of Germany.[103] Therefore, the first energy market legislation was only adopted in 1996.

Directive 96/92/EC acknowledges the specific organisational situation of the respective power sectors in the member states and allows each of them "to choose the regime which corresponds best to its particular situation."[104] However, it seeks to achieve "a directly comparable level of opening-up of markets" and "a directly comparable degree of access to electricity markets."[105] This objective proved difficult to realise.[106] When Directive 2003/54/EC[107] repealed Directive 96/92/EC, it identified as the main obstacles to a competitive and integrated market insufficient network access, tariff issues, and "different degrees of market opening."[108]

The implementation of market liberalisation was a demanding task. The main problems were a lack of independence of regulatory authorities, persistent abuse of their dominant position by incumbent companies in national markets, reluctant efforts to unbundle generation, transmission, and distribution assets, the continuation of a high level of vertical integration of energy companies, and price regulation in some markets that distorted competition.[109]

In 2012, the European Commission concluded that following the adoption of the electricity directives in 1996 and 2003 the member states had adjusted their national legislation too slowly. The Commission attributed this to "inward-looking or nationally inspired policies."[110] As a result, the EU

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[101] The legal basis to create a common market was the Single European Act (SEA) that was adopted to establish a common market applicable to the territories of the European Economic Community. Article 13 SEA stipulates that the Community "shall adopt measures with the aim of progressively establishing the internal market over a period expiring on 31 December 1992. … The internal market shall comprise an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured in accordance with the provisions of this Treaty." *See*, Single European Act, OJ L 169, 29.6.1987, pp. 1–28.
[102] European Commission, "The Internal Energy Market," 2 May 1988, COM(88) 238 final, pp. 1–88.
[103] Grunwald, Jürgen, *Das Energierecht der Europäischen Gemeinschaften: EGKS-EURATOM-EG, Grundlagen, Geschichte, geltende Regelungen* [Energy law of the European Communities: ECSC-EAEC-EC, foundations, history, applicable rules]. Berlin: De Gruyter, 2003, 55.
[104] Directive 96/92/EC, recital 11.
[105] Ibid., recital 12.
[106] *See* for the political and economic difficulties during the early phase of market integration, Eising, Rainer, and Nicolas Jabko, "Moving Targets: National Interests and Electricity Liberalization in the European Union," *Comparative Political Studies* 34, no. 7 (2001): 742–67.
[107] Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning the common rules for the internal market in electricity and repealing Directive 96/92/EC, OJ L 176, 15.7.2003, pp. 37–55.
[108] Ibid., recital 5.
[109] Nowak, Bartlomiej, "Energy Market of the European Union: Common or Segmented?," *The Electricity Journal* 23, no. 10 (2010): 29–30.
[110] European Commission, "Making the Internal Energy Market Work," 15 November 2012, COM(2012) 663 final, p. 2.

was not on track to fully implement the legislation of the 2009 Third Energy Package[111] by 2014, "including putting in place the essential technical rules at EU level, and providing regulators with necessary tools and resources to enforce legislation effectively."[112]

To accelerate the reform process, the Commission started to pursue infringement procedures[113] against member states that lagged behind in transposing the Third Energy Package into national law.[114] The Commission sought to enforce competition rules in order to "level the playing field in the power generation sector."[115]

The 2009 Third Energy Package had a far-reaching impact on the organisation of the power sector. Indeed, this package strengthened the central regulation of the common electricity market by introducing a new regulatory body, the Agency for the Cooperation of Energy Regulators (known as ACER), that would coordinate the work of national regulators and advise on the implementation of EU electricity legislation. Accordingly, the Third Energy Package further altered the interaction between sectoral representative and policymaking, which was confined to national debates in the past. Thus, national regulatory cultures changed through the implementation of EU legislation.[116]

The Third Energy Package contains new rules for the integration of the natural gas and electricity markets. Directive 2009/72[117] concerns the integration of the electricity market. It repealed Directive 2003/54. Directive 2009/72 identifies non-discriminatory network access and effective regulatory supervision as important aspects of power market liberalisation that still needed improvement.[118] Regulation 714/2009[119] accompanies Directive 2009/72 in order to create the

[111] The directives and regulations of the Third Energy Package seek to further promote the integration of the EU markets for natural gas and electricity. The package also established the Agency for the Cooperation of Energy Regulators. *See* for more detail on the scope of this package, subsection 5.3.2.1.

[112] European Commission, "Making the Internal Energy Market Work," 15 November 2012, COM(2012) 663 final, p. 2.

[113] The European Commission regularly publishes information about infringements procedures – i.e. "infringement packages" – that usually include cases relating to energy law. By October 2012, for instance, the Commission was pursuing or had already closed cases against all individual member states for not correctly transposing the second or third energy package. In 2019, the Commission referred a case against Belgium to the Court of Justice for not transposing rules regarding the competences of the national regulator that are included in the Third Energy Package (Directives 2009/72/EC and 2009/73/EC). *See* for an overview of infringement procedures by late 2012, European Commission, "Energy Markets in the European Union in 2011," November 2012, https://op.europa.eu/en/publication-detail/-/publication/de999ff8-5058-42a9-b61f-67ff441fd953, p. 155; European Commission, "Energy: Commission Refers Belgium to the Court for Failing to Comply with EU Rules on Electricity and Gas Markets," 25 July 2019, https://ec.europa.eu/commission/presscorner/detail/en/IP_19_4254.

[114] *See* for the role of the Court of Justice of the European Union, Penttinen, Sirja-Leena, "The Role of the Court of Justice of the European Union in the Energy Market Liberalization," in *Research Handbook on International Energy Law*, ed Kim Talus (Cheltenham: Edward Elgar, 2014), 241–71.

[115] European Commission, "Making the Internal Energy Market Work," 2012, p. 8.

[116] *See* for an overview of the interaction between EU legislation and sectoral governance as well as national laws and regulatory approaches, Eberlein, Burkhard, "The Making of the European Energy Market: The Interplay of Governance and Government," Journal of Public Policy 28, no. 1 (2008): 73–92; Bohne, Eberhard, "Conflicts between Regulatory Cultures and EU Energy Regulations," *Utilities Policy* 19, no. 4 (2011): 255–69.

[117] Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity, OJ L 211, 14.8.2009, pp. 55–93.

[118] Ibid., recital 4.

[119] Regulation (EC) No. 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity, OJ L 211, 14.8.2009, pp. 15–35.

regulatory framework for cross-border electricity transportation and sales. Regulation 713/2009 establishes the Agency for the Cooperation of Energy Regulators[120] and details its responsibility to monitor the implementation of Directive 2009/72 as well as regarding the cooperation between transmission system operators.

The energy governance structure of the EU evolved further, when the Lisbon Treaty was signed and entered into force in late 2009.[121] The new energy title (XXI) of the Treaty on the Functioning of the EU (TFEU)[122] gave more prominence to the common energy policy of the Union. Article 194 (1) TFEU sums up four goals of EU energy policy – ensuring the functioning of the energy market,[123] ensuring security of energy supply,[124] promoting energy efficiency and energy saving as well as the development of new and renewable forms of energy,[125] and promoting the interconnection of energy networks.[126]

However, the inclusion of this article in the TFEU did not change the "status quo" of policymaking. Rather, it acknowledged growing role of the Commission in the field of energy policy,[127] as illustrated by the increasingly comprehensive legislative efforts to integrate the electricity and gas markets. Article 194 TFEU thus provides a legal basis for energy legislation and further legitimises the Commission's pro-active approach. Moreover, the article reflects a shared vision among the EU member states to pursue common energy policies.[128]

The aim of the Third Energy Package was to accelerate the integration of the member states' electricity and gas markets. Achieving a centralisation of policymaking in the field of energy was vital, in order to further dovetail EU energy and climate policies. This process commenced at the end of the first decade of the 21st century.[129] Both processes – market integration and the streamlining of energy and climate policies – were only in an initial stage, when the member states began to implement the Third Energy Package.[130] Undoubtedly, the implementation of various regulatory and

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[120] Regulation (EC) No. 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators, OJ L 211, 14.8.2009, pp. 1–14.
[121] *See* for an assessment of the evolution of the legal basis of EU energy legislation, Maxian Rusche, Tim, *EU Renewable Electricity Law and Policy: From National Targets to a Common Market*. Cambridge: Cambridge University Press, 2015, 202–13.
[122] Consolidated Version of the Treaty of the Functioning of the European Union of 13 December 2007, OJ C 326, 26.10.2012, pp. 134–5.
[123] Article 194 (1) (a) TFEU.
[124] Article 194 (1) (b) TFEU.
[125] Article 194 (1) (c) TFEU.
[126] Article 194 (1) (d) TFEU.
[127] Wettestad, Jørgen, Per Ove Eikeland, and Måns Nilsson, "EU Climate and Energy Policy: A Hesitant Supranational Turn?," *Global Environmental Politics* 12, no. 2 (2012): 67–86.
[128] Martin Nettesheim points to the fact that EU energy policy will continue to evolve through the interaction between EU institutions and the member states, while some national peculiarities will continue to interfere with proposals that the Commission makes. *See*, Nettesheim, Martin, "Das Energiekapitel im Vertrag von Lissabon" [The energy title of the Lisbon Treaty], *JuristenZeitung* 65, no. 1 (2010): 20, 24.
[129] Skjærseth, Jon Birger, "Linking EU Climate and Energy Policies: Policy-making, Implementation and Reform," *International Environmental Agreements: Politics, Law and Economics* 16, no. 4 (2016): 509–23.
[130] Helm, Dieter, "The European Framework for Energy and Climate Policies," *Energy Policy* 64 (2014): 30–3.

technical measures that were necessary to accomplish the single market for electricity would take time. The member states began to pool efforts in regional initiatives to coordinate their national energy market laws and achieve market integration via an immediate step of regional cooperation.[131] The establishment of the Pentalateral Forum is a case in point. Through this forum, France, Belgium, Luxembourg, the Netherlands, Germany, and Austria[132] coordinate the implementation of EU energy market legislation in their jurisdictions. The forum thus facilitates regular informal exchange on practical matters among ministerial officials, representatives of national regulators, and transmission system operators.[133]

In early 2015, the European Commission launched the Energy Union.[134] This policy initiative sought to both integrate the establishment of the internal energy market with the external dimensions of EU energy supply and existing climate change policies.[135] This overhaul of EU energy and climate policies was announced in anticipation of the Paris Agreement.[136] The document highlights the centrality of power market integration to achieve the Energy Union.[137]

The functioning of the common market for electricity is key to the EU energy system's low-carbon transition. Further harmonisation of power sector organisation among member states was considered inevitable. In addition, during the course of establishing the Energy Union, the European Commission was expected to shift further decision-making power on energy issues from the national level to the Union level – a process that had been ongoing for about two decades. Similar to the conclusions about U.S. legislation to liberalise the power sector, strengthening central coordination and enforcement at the EU level seemed to be inevitable in this process.

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[131] De Jong, Jacques, and Koen Groot, "A Regional EU Energy Policy?," *CIEP Energy Papers*, no. 6 (2013), http://www.clingendaelenergy.com/inc/upload/files/CIEP_paper_2013_06_1.pdf, pp. 1–52; Umpfenbach et al, "Regional Cooperation in the Context of the New 2030 Energy Governance," Ecologic Institute Report, 30 January 2015, http://ecologic.eu/sites/files/publication/2015/regional-cooperation-energy-2030.pdf, pp. 1–23.

[132] Switzerland participates as an observer. See also, Benelux, "Pentalateral Energy Forum," http://www.benelux.int/nl/samenwerking/pentalateral-energy-forum/.

[133] The Pentalateral Forum initially consisted of five members (France, Belgium, Luxembourg, the Netherlands, and Germany). In 2011, Austria joined as a member and Switzerland as an observer. *See* for the Pentalateral Forum's goals and achievements, Umpfenbach et al, 2016, pp. 9–10; *see* for the Pentalateral Forum's role in the integration of regional markets and promoting exchange on renewables policies among policymakers, Handke, Susann, "Renewables and the Core of the Energy Union: How the Pentalateral Forum Facilitates the Energy Transition in Western Europe," in *The Geopolitics of Renewables*, ed. Daniel Scholten (Cham: Springer Nature, 2018), 289–92.

[134] European Commission, "A Framework Strategy for a Resilient Energy Union with a Forward-looking Climate Change Policy," 25 February 2015, COM(2015) 80 final, pp. 1–21.

[135] Szulecki et al describe how the debate unfolded after the Energy Union Communication had been published. The debate concerned various interests of the member states and the path towards further integration, including the emphasis of regional cooperation. *See*, Szulecki et al, "Shaping the 'Energy Union': Between National Positions and Governance Innovation in EU Energy and Climate Policy," *Climate Policy* 16, no. 5 (2016): 548–67.

[136] In 2016, the Commission proposed a package of new legislation in order to implement the policy proposals. *See* for a brief overview of the changes, in section 8.2. of chapter eight.

[137] The priority that is given to market integration is stressed by the fact that the "full implementation and strict enforcement of existing energy and related legislation" listed as the first of fifteen actions points. *See*, European Commission, "A Framework Strategy for a Resilient Energy Union with a Forward-looking Climate Change Policy," p. 19.

5.3.1.3. China

The necessity of strong central guidance to transform the electricity sector was even more pronounced in the case of China. The country's power sector reform began in the mid-1980s. After 1985, some responsibilities of the previously highly centralised power sector were devolved to provincial governments. In addition, the central government encouraged investments[138] in new power plants in order to combat power shortages that were hampering economic development across the country. By the mid-1990s, the supply and demand situation had stabilised.[139]

In 1995, the Electric Power Law[140] was adopted. Article 3 of the Electric Power Law encouraged domestic and foreign private investment in the Chinese power sector. Article 13 only vaguely addresses the options that newly built power plants have to access the grid. Article 14 determines that all investments must be in accordance with the electricity development plan and the national electricity industry policy. Article 16 states that the power sector is supervised and regulated by the Ministry of Electric Power, while other ministries under the central government regulate specific aspects of the industry. The Electric Power Law was amended in 2009 and 2015.

However, the most salient reform steps were initiated by consecutive government communications. In 1997, government functions and business activities in the power sector were separated. The State Power Corporation took over all electricity assets from the Ministry of Electric Power and started to manage the operation of the power system. This entity was a highly vertically integrated utility that was active in power generation, transmission, distribution, and power sales. It controlled half of the country's generation capacity and owned all transmission assets.[141]

The restructuring of the State Power Corporation was one of the goals that the State Council, China's central government, wanted to achieve when it issued a *Plan to reform the structure of the power industry*[142] in early 2002. The plan suggests to split the grid monopoly into two entities – State Grid Corporation and China Southern Power Grid – and to establish five regional network

[138] Investments were mainly derived from local governments and large state-owned enterprises. Foreign investments were generally supported by multilateral institutions – such as the World Bank and the Asian Development Bank – and foreign governments through developmental aid agencies. Foreign participation in the electricity sector was possible by establishing joint ventures with local entities. Xu Yi-chong, *Sinews of Power: The Politics of the State Grid Corporation of China*. Oxford: Oxford University Press, 2017, 49–50.

[139] *See* for an overview and evaluation of China's power sector reform, Andrews-Speed, Philip, and Stephen Dow, "Reform of China's Electric Power Industry Challenges Facing the Government," *Energy Policy* 28, no. 5 (2000): 335–47.

[140] 中华人民共和国电力法, 1995 年 12 月 28 日第八 届全国人民代表大会常务委员会第十七次会议通过, 1995 年 12 月 28 日中华人民共和国主席令第六十号公布,自 1996 年 4 月 1 日起施行 [Electric Power Law of the People's Republic of China, adopted at the 17th meeting of the Standing Committee of the Eighth National People's Congress on 28 December 1995, promulgated by order no. 60 of the President of the People's Republic of China on 28 December 1995, to become effective on 1 April 1996].

[141] An Bo et al, "China's Market-oriented Reforms in the Energy and Environmental Sectors," *NBR 2015 Summit Working Paper*, May 2015, http://nbr.org/downloads/pdfs/ETA/PES_2015_workingpaper_AnBo_et_al.pdf, pp. 7–8.

[142] 电力体制改革方案（国务院 2002 年 2 月 10 日发布国发［2002］5 号）[Plan to reform the structure of the power industry (State Council, 10 February 2002, State Council document no. 5 [2002]).

companies.[143] The main purpose of the plan was to break up the monopoly and promote competition. It demanded the introduction of a sound price system and development of a fair, open, competitive, and well-organised electricity market, supervised by an authority under the government.[144] These reforms were implemented in 2002.[145] They resulted in the establishment of two state-owned grid companies State Grid and China Southern Power Grid and five generation companies – Huaneng, Datang, Guodian, Huadian, and China Power Investment. State Grid controlled by far the largest share of the country's transmission network (about 80%), while China Southern Power Grid operated the networks of the southern provinces.[146]

The 2002 Plan also called for the creation of a power market regulation commission under the State Council.[147] In 2003, the State Electricity Regulatory Commission was established. Yet, it never gained full independence and sufficient authority.[148] In 2013, the responsibilities of the State Electricity Regulatory Commission were taken over by the National Energy Administration.[149] The National Energy Administration is a government agency under the National Development and Reform Commission, China's main economic policymaking body.

By the mid-2010s, China had entered a new phase of its economic development. After years of high annual growth rates, economic expansion decelerated. The government tried to implement economy-wide reforms to adjust to the new situation. In March 2015, the Central Committee of the Chinese Communist Party and the State Council jointly issued Document 9 on *Some opinions regarding the further deepening of the power sector reform*.[150]

Key aspects of these reform proposals were the continued work to unbundle power generation and transmission and to further separate state agencies from the power business. The reform proposals also called for the establishment of a cross-provincial electricity exchange. The proposals admitted that the electricity sector continued to face difficulties to sufficiently utilise electricity generated from renewables in the existing power system. The problem of non-discriminatory access to the distribution network had not been solved yet. Finally, the state of the legislative work was criticised. The legislation on the power sector was described as "outdated." The legal basis for further

[143] Ibid., para 9.
[144] Ibid., para 5.
[145] An Bo et al, "China's Market-oriented Reforms in the Energy and Environmental Sectors," 2015, p. 8.
[146] Xu, 2017, 70–1.
[147] Plan to reform the structure of the power industry, 2002, para 23.
[148] Tsai Chung-min, "Regulating China's Power Sector: Creating an Independent Regulator without Autonomy," *The China Quarterly* 218 (2014): 452–73.
[149] "China to Restructure National Energy Administration," *Xinhua*, 10 March 2013.
[150] 关于进一步深化电力体制改革的若干意见（中共中央国务院 2015 年 3 月 15 日发布中发［2015］9 号）[Some opinions regarding the further deepening of the power sector reform (Central Committee State Council, 15 March 2015, Central Committee document no. 9 [2015])].

reforms had been weakened, while the slow work of the legislator hindered the power sector's further market liberalisation and constructive development.[151]

The 2015 reform proposals were remarkable for two reasons. First, the fact that this call for action was jointly issued by a leading policy body of the Chinese Communist Party and the central government points to a considerable gridlock in the state bureaucracy. Second, many points that were raised highlighted differences in policy priorities at the central and sub-national levels. From the outset, the central government had been struggling to take the lead in the transformation of the power sector, with respect to the restructuring of the power sector and, later on, concerning the measures that were needed to guide the low-carbon power transition.

The proposed reforms were gradually implemented. They mainly sought to bring about an adjustment of the pricing mechanism in the power sector, a better coordination of planning agencies in the power sector, an improvement of the utilisation of renewables, and a new price regulation for grid companies.[152] The implementation of the reforms were led by provincial governments instead of a central approach. Since the provincial governments have an incentive to reduce the cost of electricity supply and become more competitive than rival provinces, it was expected that this would lead to strong incentives to promote the reform measures.[153] However, general challenges for the development of China's power sector were the insufficient government coordination of planning and investment processes, inefficient resource allocation due to lacking trading mechanisms, an inadequate market-based pricing mechanism, and the mismatch with respect to the deployment and utilisation of renewable electricity.[154]

To sum up, in the three jurisdictions market liberalisation commenced at different moments in time. In the U.S., important legislation was implemented during the 1990s, while reforms in the EU and China began in the late 1990s and are still ongoing. In all three jurisdictions, market reforms increasingly interact with climate policies and complicate the implementation processes. Finally, an important challenge is the place of decision-making power. The liberalisation process witnessed a centralisation of decision-making, while important practical issues can only be solved at local or regional levels.

[151] Some opinions regarding the further deepening of the power sector reform, 2015.
[152] Zeng et al, "The Power Industry Reform in China 2015: Policies, Evaluations, and Solutions," *Renewable and Sustainable Energy Reviews* 57 (2016): 101–2.
[153] Hernández, César Alejandro, and Li Xiang, *Power Sector Reform in China: An International Perspective*. Paris: OECD/IEA, 2018, 27.
[154] Ibid., 25–6.

5.3.2. Decarbonising power generation in the EU, U.S., and China

The previous section 5.2. already alluded to the interaction between liberalisation policies and decarbonisation measures. Subsection 5.3.1. also mentioned instances of policy interaction that complicated the development of the power sector in the EU, U.S., and China. The general overview of decarbonisation measures in the power sector that was presented in subsections 5.2.2.1. and 5.2.2.2. identified some trends that gradually evolved in many states from the turn of the century onwards, such as the introduction of a carbon price, support schemes for renewable energy sources, and the integration of power markets across large balancing regions. In many states, these trends were observable by the mid-2010s. The following two subsections discuss how these trends unfolded in the EU, U.S., and China.

5.3.2.1. Rules for carbon prices and low-carbon investments

This subsection considers the how low-carbon legislation and policies in the EU, U.S., and China were implemented and how they interacted with the outcomes of the previous and ongoing efforts to liberalise the electricity sectors in these jurisdictions. It is beyond the scope of this overview to assess the rationale behind carbon price mechanisms or support schemes in the three jurisdictions. The focus is on the legislation and the interaction of the policies.

A) European Union

The liberalisation of the electricity and gas sectors were instigated by the European Commission (Commission) during the late 1990s. As mentioned in the previous subsection, the Commission then also pursued the objective of market integration. However, the legal basis for introducing climate and energy legislation that structurally interferes with the energy consumption patterns[155] in the member states was less straightforward.[156] Nevertheless, the Commission was the main proponent of early measures to set up a carbon trading scheme and enact legislation to support the use of renewables in the electricity sector. This subsection gives an overview of the rich body of legislation and policy strategies that were initiated by the Commission.

[155] The introduction of an emissions trading scheme would increase the price of electricity that is based on fossil fuels. This aims to accelerate the transition to other fuels (or implement measures that result in net-zero emissions). The introduction of laws to stimulate the use of renewables to generate electricity also aims to change the structure of the energy mix.

[156] It proved to be difficult for the member states to agree on a common approach to energy issues beyond a European policy on electricity and gas transport infrastructure. *See*, Grunwald, 2003, 54–61.

As early as 1999, the Commission proposed establishing a Union-wide emission-trading scheme.[157] The Commission wanted to start a debate among member states of how to implement the market mechanisms of the KP. The Commission's early thoughts on these issues are interesting for two reasons. First, the proposal considered the implementation of an emission-trading system and clearly locates the task in the area of environmental regulation, while admitting that the Kyoto mechanisms "are new to EU environmental policy."[158] Second, the Commission did not specifically link this emission-trading system to the fossil-based energy sector, but considers the emission of greenhouse gases as a problem of "almost every economic activity." [159] The choice for CO_2 as the greenhouse gas with which a trading scheme should start was based on the fact that this gas can be measured most accurately.[160]

Considering the Commission's thinking at this early stage of the low-carbon transition helps to understand how the framework of EU climate policies evolved, including the EU Emission Trading System (EU ETS).[161] Initially, EU climate change policies were rather removed from the field of energy policy. Directive 2003/87/EC[162] that established the EU ETS considers emission reduction as an issue that belongs to the realm of EU environmental policy, dealt with at different directorate generals of the Commission.[163] The provisions of ETS Directive 2003/87/EC were not linked to energy legislation that was enacted at the same time, such as legislation on renewables and electricity market integration. Directive 2001/77/EC[164] on the promotion of renewables in the power sector was passed two years earlier. Moreover, only months before the ETS Directive was passed far-reaching legislation on the internal energy market was adopted, including Directive 2003/54/EC.[165]

Only in 2007 the Commission published document *An Energy Policy for Europe*. This was the first official document that considered climate and energy policy in a comprehensive way.[166] Given that CO_2 emitted from the combustion of fossil fuels to generate energy was responsible for 80% of

[157] European Commission, "Preparing for Implementation of the Kyoto Protocol," 19 May 1999, COM(1999) 230, pp. 1–10.
[158] Ibid., 14.
[159] Ibid., 3.
[160] Ibid., 16.
[161] *See* for an assessment of the EU ETS Directive, Posser, Herbert, and Stefan Altenschmidt, "European Union Emissions Trading Directive," *Journal of Energy and Natural Resources Law* 23, no. 1 (2005): 60–72.
[162] Directive 2003/87/EC of the European Parliament and of the Council of 13 October 1999 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, OJ L 275, 25.10.2003, pp. 32–46. *See* for an overview of the legislative history of the EU ETS, European Commission – Climate Action, "The EU Emissions Trading System (EU ETS)," http://ec.europa.eu/clima/policies/ets_en#Legislative_history.
[163] Energy issues were dealt with at DG TREN (transport and energy), while DG Environment was responsible for climate policy. Since the restructuring of the Commission in 2010, DG ENER has been responsible for energy policy; and DG CLIMA drafts climate policies.
[164] Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market, OJ L 283, 27.10.2001, pp. 33–40.
[165] Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning the common rules for the internal market in electricity and repealing Directive 96/92/EC, OJ L 176, 15.7.2003, pp. 37–55.
[166] European Commission, "An Energy Policy for Europe," 10 January 2007, COM(2007) 1 final, pp. 1–28.

all greenhouse gas emissions in the EU at that time,[167] the Commission stipulated that greenhouse gas emissions should take centre stage in the EU's energy policy. As a result, from 2007 onwards, overall energy policies became more consistent with climate proposals; and both policy fields began to display more coherence. The integration of energy and climate legislation began with the 2009 energy and climate package.[168]

The EU ETS eventually started operating in 2005. It became the world's largest cap-and-trade programme and was based on a EU-wide cap on emissions that was supposed to decline annually.[169] Within this cap, companies received or bought emission allowances. Companies could also trade these allowances with one another. Article 12 (1) and (2) of Directive 2003/87/EC regulates the sale of the allowances within the Union and to third countries "where such allowances are recognised."[170] Article 11 (1) provides that member states decide individually on their assigned quantity of allowances, which their national authorities subsequently allocate to emitting installations. Thus, the EU ETS was established as a rather decentralised market framework.

The establishment of the EU ETS was an important institutional achievement, mainly because it retained the potential of connecting carbon-emission trading schemes globally in the future, as stated in Article 25 of Directive 2003/87/EC. Indeed, the amendments included in Directive 2004/101/EC[171] directly linked the EU ETS with the market mechanisms of the KP – joint implementation (JI) and clean development mechanisms (CDM).[172] The new Article 11a provides that credits obtained under the CDM and JI mechanisms can be used in the EU ETS. In 2009, the 2003 ETS Directive was revised again by Directive 2009/29/EC.[173] The new Article 9 replaced the initial provision on national allocation plans with a Union-wide quantity of allowances. As a result, the control of the ETS was more or less taken over by the Commission.

Economically, the EU ETS largely failed to achieve and maintain a price for carbon allowances that was high enough to incentivise low-carbon investments.[174] One aspect that was often mentioned in the debate about the disappointing performance of the ETS was the implementation of

[167] Ibid.
[168] Maxian Rusche, 2015, 215; *see* below for the specific legislation.
[169] *See* for an assessment of the EU ETS's first decade of operation, Ellerman et al, "The European Union Emissions Trading System: Ten Years and Counting." *Review of Environmental Economics and Policy* 10, no. 1 (2015): 89–107.
[170] Pursuant to Article 25 (1) of Directive 2003/87/EC, agreements can be concluded with third countries that are listed in Annex B to the KP.
[171] Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms, OJ L 338, 13.11.2004, pp. 18–23.
[172] Articles 6 and 12, respectively.
[173] Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community, OJ L 140, 5.6.2009, pp. 63–87.
[174] Ellerman et al, 2016, 103.

various renewable support schemes in the EU.[175] In fact, research on the reasons that caused the enormous price drop of ETS allowances after 2008 found that EU renewables policies and the development of the ETS worked "at cross-purposes."[176] The evaluation of the effect that this interaction has is difficult, mainly because it depends on three complicating factors – i.e. member states' varying support schemes for renewables in the power sector, member states' energy mixes, and decisions and policy changes of other member states as they most likely affect the EU-wide emissions market. Therefore, a harmonisation of renewables support schemes seemed necessary.[177]

Directive 2001/77/EC[178] was the first body of rules that implemented Union-wide policies to deploy renewables. It aimed to increase the share of electricity generated from renewables in the internal market. The success of renewables policies in the member states varied among member states. During the first decade of the 21st century, the renewables share in the power generation rose quickly. Rapid technological progress, high oil prices, and, relatedly, more readily available financing for renewable projects contributed to this development. In 2015, the Commission's *Renewable Energy Progress Report*[179] detailed that 26% of the EU's electricity was generated from renewables. About 10% of the total EU electricity consumption originated from variable or intermittent energy sources, such as wind and solar power.[180] As already mentioned in subsection 5.2.2.2., the increased deployment of intermittent renewables affects the stability of electricity supply and has therefore to be balanced by adding conventional power generation capacity or creating balancing areas through regional interconnection.[181]

The increase of the share of renewables in the electricity generation was not anticipated in the design of the EU ETS. Although EU policies to promote the use of renewables in the electricity sector and the creation of the ETS developed simultaneously, policymakers pursued different objectives. In fact, the Commission only gradually integrated Union-wide climate action with its energy policies.[182]

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[175] Maxian Rusche, 2015, 215–20.

[176] The growth of wind and solar power generation contributed to the price drop of allowances. Yet, it is not possible to explain the magnitude of the price drop from €30 in mid-2008 to below €4 in late 2012. In 2014 and 2015, prices ranged from €4 to 5. Even when taken together with the effects of the economic crisis the reason for this development is still inexplicable. *See* Koch et al, "Causes of the EU ETS Price Drop: Recession, CDM, Renewable Policies or a Bit of Everything? – New Evidence." *Energy Policy* 73 (2014): 684; Ellerman, 2016, 98.

[177] Maxian Rusche, 2015, 220.

[178] Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market, OJ L 283, 27.10.2001, pp. 33–40.

[179] European Commission, "Renewable Energy Progress Report," 15 June 2015, COM(2015) 293 final, pp. 1–16.

[180] Ibid., 3, 7–8.

[181] See subsection 5.3.2.2. on how the EU tried to deal with this challenge.

[182] During the 1990s, the EU energy policy mainly focused on promoting liberalisation and increasing competitiveness. In the late 1990s and early 2000s, energy legislation was developed by the Directorate-General TREN (transport and energy), while the Directorate-General Environment was responsible for climate policy. As a result, EU climate and energy policies developed separately. The European Commission was reorganised in 2010. Energy was split from DG TREN to become DG ENER; and the EU climate policy was transferred from DG Environment to the stand-alone DG CLIMA. *See* for further information, "European Commission: Departments and Executive Agencies," https://ec.europa.eu/info/departments.

By the end of the first decade of the 21st century, problems with the growing share of renewables in the electricity generation pointed to the nexus between climate, environmental, and energy policies. Several adjustments of the regulatory measures were necessary to deal with negative side effects. In order to further advance the decarbonisation of the electricity sector, a better integration of the EU ETS with renewable energy policies became inevitable.[183] The renewables Directive 2009/28/EC[184] and the ETS Directive 2009/29/EC addressed these concerns. They were passed as part of a comprehensive package of legislation[185] on climate change and energy.

The 2009 Third Energy Package primarily addressed the completion of the internal power and gas markets.[186] Arguably, the Third Energy Package marked an important turning point in EU energy legislation, mainly because it reflected a departure from the pure market-based mechanism and supported a hybrid governance regime in which the state and public sector actors play significant roles.[187] In fact, for the establishment of the internal gas and electricity markets, more public investment and stronger public intervention was needed to accomplish market integration and ensure fair regulation.[188] This turn in regulatory policy also facilitated the integration of climate measures into energy regulation and public investment in climate change mitigation.

However, the failure of COP-15 in Copenhagen in late 2009 hampered the further development of the carbon trading plans that Commission had prior to the summit.[189] Furthermore, during the following years the carbon price remained too low to instigate faster climate action.[190] National

[183] Lehmann, Paul, and Erik Gawel, "Why Should Support Schemes for Renewable Electricity Complement the EU Emissions Trading Scheme?," *Energy Policy* 52 (2013): 597–607.

[184] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, OJ L 140, 5.6.2009, pp. 16–62.

[185] The other components of the 2020 climate and energy package are Decision No. 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020, OJ L 140, 5.6.2009, pp. 136–48; Directive 2009/31/EC on the geological storage of carbon dioxide, OJ L 140, 5.6.2009, pp. 114–35. The package is complemented by the Energy Efficiency Plan 2011. *See*, European Commission, "Energy Efficiency Plan 2011," 8 March 2011, COM(2011) 109 final, pp. 1–15, and Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, OJ L 315, 14.11.2012, pp. 1–56. *Cf*. also the summary of the 2020 climate and energy package at http://eur-lex.europa.eu/summary/EN/uriserv:2001_8.

[186] The 2009 Third Energy Package consists of the following legislation: Regulation (EC) No. 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators, OJ L 211, 14.8.2009, pp. 1–14; Regulation (EC) No. 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity, OJ L 211, 14.8.2009, pp. 15–35; Regulation (EC) No. 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission network and repealing Regulation (EC) No. 1775/2005, OJ L 211, 14.8.2009, pp. 36–54; Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC, OJ L 211, 14.8.2009, pp. 55–93; Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC, OJ L 211, 14.8.2009, pp. 94–136.

[187] Talus, Kim, *EU Energy Law and Policy: A Critical Account*. Oxford: Oxford University Press, 2013, 284–5.

[188] Ibid.

[189] Jørgen Wettestad points to the fact that, next to the "disappointing" international developments, the international financial crisis and the subsequent euro crisis affected the prospects for a functioning EU ETS. *See*, Wettestad, Jørgen, "The EU Emissions Trading System: Frontrunner in Trouble," in *Research Handbook on Climate Change Mitigation Law*, ed. Geert Van Calster, Wim Vandenberghe, and Leonie Reins (Cheltenham: Edward Elgar, 2015), 467.

[190] Ibid., 473.

renewables legislation and the deployment of renewable energy sources in the member states developed very differently. Over time, 28 different support scheme emerged.[191]

Still, the Commission continued to propose climate and energy strategies during the following years. Furthermore, the proposals revealed an ever integrated approach to converge energy and climate policies. Important milestones in the interaction between and the fusion of climate and energy policies were the so-called 20-20 by 2020 Strategy[192] that was issued in 2008, the far-reaching legislation of the 2009 climate and energy package,[193] the 2050 Low-carbon and Energy Roadmaps[194] that were announced in 2011, and the 2015 Energy Union.[195]

The Commission's 20-20 Strategy contained two main objectives. By 2020, the EU should increase the share of renewables in its overall energy consumption to 20% and a reduction of greenhouse gas emissions of at least 20%, based on 1990 levels.[196] Moreover, the 2009 climate and energy package included a range of low-carbon measures, such as the deployment of renewable energy sources, extension of the EU emission trading system, reduction of emissions in the transport sector, and regulation of underground CO_2 storage (carbon capture and storage, CCS).

A consistent feature of the policy communication issued by the Commission was the notion that it was technologically and economically feasible for the EU to achieve domestic emissions reductions and implement other climate measures, especially reductions of at least 80% by 2050, compared to 1990. Furthermore, the Commission emphasised the various economic advantages of this large-scale transformation.[197] In 2005, for instance, the Commission stressed in its

[191] Maxian Rusche, 2015, 68–76.
[192] European Commission, "20 20 by 2020: Europe's Climate Change Opportunity," 23 January 2008, COM(2008) 30 final, pp. 1–12.
[193] The legislation also concerns the transport sector. *See*, Decision No. 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020, OJ L 140, 5.6.2009, pp. 136–48; Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, OJ L 140, 5.6.2009, pp. 16–62; Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community, OJ L 140, 5.6.2009, pp. 63–87; Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC, OJ L 140, 5.6.2009, pp. 89–113; Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006, OJ L 140, 5.6.2009, pp. 114–35; Regulation (EC) No. 443/2009 of the European Parliament and of the Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO2 emissions from light-duty vehicles, OJ L 140, 5.6.2009, pp. 1–15.
[194] European Commission, "A Roadmap for Moving to a Competitive Low Carbon Economy in 2050," 8 March 2011, COM(2011) 112 final, pp. 1–15; European Commission, "Energy Roadmap 2050," 15 December 2011, COM(2011) 885 final, pp. 1–20.
[195] European Commission, "Energy Union Package: A Framework Strategy for a Resilient Energy Union with a Forward-looking Climate Change Policy," 25 February 2015, COM(2015) 80 final, pp. 1–21.
[196] European Commission, "20 20 by 2020," 2008, p. 2.
[197] In its 2005 Communication, the Commission stressed that the benefits of climate change mitigation and achieving the goal of limiting global warming to 2°C outweigh the costs of adaption to climate change in the future.; *see* European Commission, "Winning the Battle against Global Climate Change," 2005, p. 4.

communication *Winning the Battle against Global Climate Change* that the benefits of climate change mitigation and achieving the goal of limiting global warming to 2°C outweigh the costs of adaption to climate change in the future.[198]

The EU also pursued this approach in international climate negotiations, especially as part of its attempts to form coalitions. It tried to take into account the interests and situation of other parties. Obviously, economic considerations were highly relevant in such conversations. On these occasions, EU representatives frequently emphasised the economic benefits of decarbonisation.[199]

The fact that the EU – as largest economic entity at the time[200] – announced and pursued a far-reaching transition of its economy to low-carbon energy generation put enormous weight behind its plans and policies. Subsequently, the EU demonstrated that a decoupling of economic development and increasing emissions is possible. During the period from 1990 to 2013, the EU decreased greenhouse gas emissions by 19% while its GDP grew by 45%.[201] Thus, the EU promoted the economic aspects of the decarbonisation concept. This approach relied on the implementation of EU climate and energy policies domestically and "advertising" its successes related to the specific situation of other parties in UN climate negotiations.

The 2050 Low-carbon Roadmap that was published in 2011 continued the focus on economic aspects of the low-carbon transition. It lists the main elements that should shape the path of the EU to "a competitive low carbon economy by 2050."[202] It sets forth a 80 to 95% reduction of greenhouse gases compared to 1990.[203] To achieve this goal, all member states needed to develop national low-carbon strategies.[204] The 2050 Low-carbon Roadmap is closely related to the 2050 Energy Roadmap that specifically explores decarbonisation scenarios.[205] It concludes that the costs in all scenarios are similar, but a "common EU approach can help keep costs down."[206]

The 2050 Energy Roadmap states that "decarbonisation is feasible."[207] It acknowledges that public support schemes were necessary to introduce new energy technologies, but considers private

[198] European Commission, "Winning the Battle against Global Climate Change," 2005, p. 4.
[199] Dimitrov, Radoslav, "The Politics of Persuasion: UN Climate Change Negotiations," in *Handbook of Global Environmental Politics*, 2nd ed. (Cheltenham: Edward Elgar, 2012), 80.
[200] In 2005, when the European Commission published the communication "Winning the Battle against Climate Change," the EU was the largest economy with a GDP of U.S.$14.4 trillion (in current U.S. dollars). The United States had a GDP of U.S.$13.1 trillion, and China's GDP reached U.S.$2.3 trillion. *See*, The World Bank, "Data," https://data.worldbank.org/.
[201] Delbeke and Vis, 2015, 17.
[202] European Commission, "A Roadmap for Moving to a Competitive Low Carbon Economy in 2050," 2011, p. 3.
[203] Ibid., p. 4.
[204] Ibid., p. 14.
[205] European Commission, "Energy Roadmap 2050," 2011, p. 4.
[206] Ibid., p. 18.
[207] Ibid.

investors as key players. It was convinced that "investments will pay off."[208] The various steps of the low-carbon transition allegedly provided an economic opportunity. Thus, the Commission constantly tried to communicate a viable response to the threat of climate change and sought to reduce uncertainty by shaping institutions that enabled collective climate action.

During the period from 2013 to 2015, the Commission published various reports and guidelines in order adjust its policies.[209] In 2015, efforts to establish an Energy Union[210] pointed to an integrated approach. The policy document announced the adoption of legislation to implement new energy and climate measures. At the core of the Energy Union is "an ambitious climate policy," while it aims to "give EU consumers – households and businesses – secure, sustainable, competitive and affordable energy."[211] Commentators conclude that the Energy Union's design "confirms the strategic alignment of the climate and energy agenda."[212] Hence, with this document climate measures became an integral part of EU energy policy. Decarbonisation emerged as a salient feature of the European energy system.

B) United States

In United States, lawmakers chose not to pass a comprehensive federal act on climate change mitigation. In 2011, however, the U.S. Environmental Protection Agency (EPA) used its authority under the 1963 Clean Air Act[213] to start regulating greenhouse gas emissions.[214] In 2013, President Barack H. Obama announced a series of executive actions – the so-called Clean Power Plan[215] – that aimed to reduce carbon pollution from power generation. In a Presidential Memorandum, he directed EPA to design carbon pollution standards for the power sector.[216] In his order to EPA to issue standards on carbon pollution, President Obama explicitly referred to "actions already underway in

[208] Ibid., pp. 16, 19.
[209] Maxian Rusche, 2015, 186–200; *see* for an overview of the debate, Henriot, Arthur, and Jean-Michel Glachant, "Melting-pots and Salad Bowls: The Current Debate on Electricity Market Design for Integration of Intermittent RES," *Utilities Policies* 27 (2013): 57–64.
[210] European Commission, "A Framework for a Resilient Energy Union with a Forward-looking Climate Change Policy," 2015, pp. 1–21.
[211] Ibid., p. 2.
[212] Delbeke et al, "Climate Related Energy Policies," in *EU Climate Policy Explained*, ed. Jos Delbeke and Peter Vis (Brussels: European Union, 2016), 55.
[213] Public Law 88-206.
[214] *See* for an overview of the legal and regulatory actions that the EPA took, including a link to the U.S. Supreme Court Decision in *Utility Air Regulatory Group v EPA* , 134 S. Ct. 2427 (2014), that halted some of these permission procedures with respect to greenhouse gas emissions, U.S. Environmental Protection Agency, "Clean Air Act Permitting for Greenhouse Gases," https://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases.
[215] *See*, U.S. Environmental Protection Agency – EPAS's Web Archive, "Clean Power Plan and Carbon Pollution Standards: Regulatory Actions," https://archive.epa.gov/epa/cleanpowerplan/clean-power-plan-and-carbon-pollution-standards-regulatory-actions.html.
[216] The White House – Office of the Press Secretary, "Presidential Memorandum: Power Sector Carbon Pollution Standards," 25 June 2013, https://obamawhitehouse.archives.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards.

States and the power sector." By doing so, he acknowledged the contribution of many federal states that had already enacted legislation to address carbon emissions in the power sector.

These initiatives were limited in scope, both geographically and with respect to their impact on the reduction of carbon emissions, mainly because given the participating federal states' had relatively small economies (and thus a small share in overall U.S. emissions). Still, the initiatives were important for two reasons. First, they carried a symbolic meaning and kept the discourse on the need to engage in climate change mitigation alive.[217] Second, regional carbon trade schemes helped incorporate the experiences from emission trading schemes that covered other pollutants and created an invaluable pool of practical knowledge on emission trade.[218] Eventually, the judiciary played an important role in clarifying the application of federal environmental laws to the regulation of carbon emissions. The Supreme Court's decision in *Massachusetts v EPA* and its halt of the implementation of the Clean Power Plan are examples in this context.[219]

Two state initiatives that implemented carbon emission trading stand out – the Regional Greenhouse Gas Initiative (RGGI)[220] and the California's AB-32 Cap-and-Trade System. The RGGI was the first regional cap-and-trade programme in the United States that addressed CO_2 emissions. The programme started in 2009. By signing a memorandum of understanding, the States of Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont established RGGI in late 2005. Later Massachusetts and Rhode Island joined RGGI, while New Jersey withdrew in 2011.[221]

Initially, RGGI aimed to limit the emission levels to that of 2009 for the period from 2009 to 2014. Although the direct impacts of the RGGI programme on carbon emissions from the power generation were rather small, the auction to sell allowances would generate more than U.S.$1.5 billion in revenues for the participating states (2008–13). By 2014, more than U.S.$1.3 billion in RGGI

[217] Carlarne, 2010, 96–7.

[218] In a report Richard Schmalensee and Robert Stavins review thirty years of various emission trade schemes and, given the "generally positive experience with cap-and-trade," expect that the federal level might eventually enact a nationwide scheme. *See*, Schmalensee, Richard, and Robert Stavins, "Lessons Learned from Three Decades of Experience with Cap-and-Trade," November 2015, http://www.rff.org/files/document/file/RFF-DP-15-51.pdf, p. 19.

[219] In 2007, the U.S. Supreme Court decided on *Massachusetts v. EPA* that under Clean Air Act the Environmental Protection Agency had authority to regulate greenhouse gases from new motor vehicles. In February 2016, the U.S. Supreme Court issued a stay and suspended the implementation of the Clean Power Plan for the period of the judicial review process, which affected industries and states had initiated. With the Clean Power Plan, the Environmental Protection Agency sought to reduce carbon emissions from power plants. *See*, *Massachusetts v EPA*, 549 U.S. 497 (2007); United States Environmental Protection Agency, "Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Section 202(a) of the Clean Air Act," https://www.epa.gov/climatechange/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a; United States Environmental Protection Agency, "Clean Power Plan: Regulatory Action," https://www.epa.gov/cleanpowerplan/regulatory-actions; Linn et al, "The Supreme Court's Stay of the Clean Power Plan: Economic Assessment and Implications for the Future," *Environmental Law Reporter* 46, no. 10 (2016): 10859–72.

[220] RGGI is registered as a non-profit corporation that provides administrative and technical services to support the development and implementation of the participating states' carbon trade programme. To regulate and institutionalise their participation in RGGI, the federal states incorporate a "model rule" into their legislation. *See*, "Regional Greenhouse Gas Initiative," http://rggi.org/rggi; and "State Statutes & Regulations," https://www.rggi.org/design/regulations.

[221] Regional Greenhouse Gas Initiative, "Memorandum of Understanding," https://www.rggi.org/design/history/mou.

proceeds had been used to finance energy efficiency initiatives, greenhouse gas abatement, as well as clean and renewable energy projects.[222] The RGGI displayed both the value of such regional initiatives and their downside. On the one hand, the initiative provided a platform for learning and training and helped develop expertise on emission trading issues. Many federal states were following its progress and considered similar programmes.[223] On the other hand, as already mentioned, the contribution of this initiative to reducing the level of CO_2 emissions in the atmosphere was negligible.[224] Furthermore, the withdrawal of New Jersey highlighted the vulnerability of such initiatives to political shifts. Without federal legislation, participating states and investors struggled to find alternative ways beyond partisan politics, which could provide a higher degree of legal certainty.

California's AB 32 cap-and-trade system was another example for state-led action to curb carbon emissions from electricity generation. It was based on the 2006 California Global Warming Solutions Act (AB 32).[225] AB-32 required California to reduce its greenhouse gas emissions to the level 1990 by the year 2020.[226] The reduction measures also include the so-called AB-32 Cap-and-Trade System.

Since 2013, this cap-and-trade system had covered electricity that was sold in California, irrespective of the place where it was generated. The cap was set at 98% of the expected emissions in 2012. Annual cuts in the cap should be made until the 1990 emission levels were achieved, which should be accomplished by 2020. The system worked with allowances that were auctioned and could be traded. Companies in energy-intensive industries, which exported goods, could be granted free allowances.[227] In 2014, California's system was linked to the cap-and-trade system of Québec, Canada, which operated in a very similar way.[228] Both systems recognised each other's allowances. The California cap-and-trade system performed as anticipated.[229] By May 2015, it had already generated over U.S.$2 billion, which at least partially should be used to fund projects that tried to

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[222] *See* in more detail, The Regional Greenhouse Gas Initiative, "The Investment of RGGI Proceeds through 2014," September 2016, http://rggi.org/docs/ProceedsReport/RGGI_Proceeds_Report_2014.pdf, pp. 1–46.
[223] Ramseur, "The Regional Greenhouse Gas Initiative: Lessons Learned and Issues for Congress," 2016, p. 19; Nussbaum, Alex, "Carbon-trading Program Generates $1.3 Billion in U.S. Northeast," *Bloomberg*, 14 July 2015, https://www.bloomberg.com/news/articles/2015-07-14/carbon-trading-program-generates-1-3-billion-in-u-s-northeast.
[224] Ramseur, "The Regional Greenhouse Gas Initiative: Lessons Learned and Issues for Congress," 2016, p. 19.
[225] Assem B 32, 2006 Gen Assem, Reg Sess (Cal 2006).
[226] The measures range from energy efficiency standards for vehicle, buildings, and appliances to standards for renewables in the electricity mix (about 20 to 30%). To achieve this reduction, the California Air Resources Board started various initiatives.
[227] *See* for further information, California Environmental Protection Agency – Air Resources Board, "Assembly Bill 32 Overview," https://www.arb.ca.gov/cc/ab32/ab32.htm.
[228] California Environmental Protection Agency – Air Resources Board, "California and Quebec Sign Agreement to Integrate, Harmonize Their Cap-and-trade Programs," 1 October 2013, https://www.arb.ca.gov/newsrel/newsrelease.php?id=508; see also the linkage agreement, *Agreement between the California Air Resource Board and the Gouvernement du Québec concerning the Harmonization and Integration of Cap-and-trade Programs for Reducing Greenhouse Gas Emissions* at https://www.arb.ca.gov/cc/capandtrade/linkage/ca_quebec_linking_agreement_english.pdf.
[229] Schmalensee and Stavins, "Lessons Learned from Three Decades of Experience with Cap-and-Trade," 2015, p. 12.

reduce greenhouse gas emissions.[230] The importance of California's AB-32 Cap-and-Trade System as a regulatory model for other federal states was mainly related to the fact that it covered a large industrial economy and offered the opportunity to integrate with other initiatives both nationally[231] and internationally.[232]

In the U.S., renewable energy sources had already attracted the federal legislators' attention in the late 1970s. In 1978, NECPA[233] was passed as part of NEA. The enactment of NECPA followed a debate about the need to reduce the reliance on imported crude oil.[234] NECPA contains provisions on energy conservation, energy efficiency measures, and support for solar energy programmes. During the following decades, the development of renewable energy plans mainly shifted to the state level. States pursued diverging policy goals when implementing renewable programmes. Their policies mainly related to their "energy economy" – i.e. a state's endowment with fossil fuels and its renewables potential.[235] Climate change mitigation was just one motive among several others when renewables were deployed in the power sector. In the absence of a national renewable energy target, the state-led hybrid economic development and energy policies[236] created a fragmented regulatory framework that was vulnerable to political change. The share of renewables in U.S. electricity production reached 12.9% in 2013. This was a significantly lower percentage compared to the OECD average.[237]

By the mid-2010s, the United States had not implemented any long-term federal support mechanism for renewable energy investments in the electricity sector.[238] State actions were vital in this policy field. Accordingly, state renewable portfolio standards (RPS) played an important role as

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[230] Ibid., 12.

[231] On 8 October 2015, New York Governor Andrew M. Cuomo, proposed a cooperation between RGGI and the Western Climate Initiative that also includes California. *See*, Governor Andrew M. Cuomo, "Governor Cuomo, Joined by Vice President Gore, Announces New Actions to Reduce Greenhouse Gas Emissions and Lead Nation on Climate Change," 8 October 2015, https://www.governor.ny.gov/news/governor-cuomo-joined-vice-president-gore-announces-new-actions-reduce-greenhouse-gas-emissions.

[232] As part of the Western Climate Initiative, California cooperates with Québec, British Columbia, and Ontario. *See* for further information, Western Climate Initiative, Inc., at http://www.wci-inc.org.

[233] Public Law 95-619.

[234] *See* for an early and one the most influential contributions to this debate, Lovins, Amory B., "Energy Strategy: The Road Not Taken?" *Foreign Affairs* 55, no 1 (1976): 65–96.

[235] Vasseur, Michael, "Convergence and Divergence in Renewable Energy Policy among US States from 1998 to 2011," *Social Forces* 92, no. 4 (2014): 1644.

[236] Hess, David J., and Quan D. Mai, "The Convergence of Economic Development and Energy-transition Policies in State-government Plans in the United States," *Sustainability: Science, Practice, and Policy* 11, no. 1 (2015): 15.

[237] At that time, the average among members of the International Energy Agency was 22.3%. The United States ranked seven-lowest among IEA member countries with regard to the share of renewable energy in electricity generation. *See*, IEA, *Energy Policies of IEA Countries: The United States – 2014 Review*. Paris: OECD/IEA, 2014(a), 113, 115.

[238] The federal government created policy measures that supported the deployment of renewables in the electricity sector – such as Production Tax Credit (PTC) and Investment Tax Credit (ITC). The ITC, enacted in 2005, mainly helped finance wind power projects, while the PTC supported solar energy projects. In contrast to fossil-fuel subsidies, which are permanent, these renewable energy tax measures have to be renewed by Congress. This leads to unpredictability as to the investment environment in which renewables installations operate. *See*, Stokes, Leah Cardamore, *Short Circuiting Policy: Interest Groups and the Battle over Clean Energy and Climate Policy in the American States*. Oxford: Oxford Univeristy Press, 2020, 15–6.

drivers for renewable energy growth in the U.S. By 2014, 29 federal states and the District of Columbia had enacted enforceable renewable portfolio standards or similar laws.[239]

The schemes in Texas and California were particularly successful. Both schemes were established in the early 2000s. In Texas, the RPS[240] required all market participants to acquire a total of 5,880 megawatt-hours (MWh) of renewable energy resources by 2015. This amounted to 5% of Texas's electricity demand. Included in this portfolio was the requirement to install 500 MW of renewable energy capacity other than wind. This non-wind renewable capacity should reach 10,000 MW by 2025. Since 2012, Texas had been penalising entities U.S.$50/MWh if a utility did not comply with its duties under the RPS targets. As a result, Texas became the leading wind power producer of the country. In 2013, it produced 21% of the entire net generation from wind in the United States. By that time, Texas already boasted over 12 gigawatts of renewable generating capacity, which exceeded its goal of 10 gigawatts by 2025.[241]

California's RPS[242] applied to all electricity retailers. They had to ensure that 20% of their retail sales originated from renewable energy sources by the end of 2013. This share should reach 33% by the end of 2020. By 2013, California accounted for more than 75% of utility-scale solar capacity installed in the U.S. Furthermore, with more than 13 million megawatt-hours of electricity California was the third-largest wind power producer in the U.S. This accounted for more 7.2% of U.S. net wind power generation.[243]

C) China

Compared to the legislative developments in the EU and federal states in the U.S., China belatedly began to enact laws on renewables and design carbon-trading schemes.[244] China's Renewable Energy Law entered into force in 2006[245] and was amended in 2009.[246] Article 14 states that grid companies

[239] IEA, 2014a, 119.
[240] *See* for more information on the renewable portfolio standard in Texas, DSIR, "Renwable Generation Requirement," https://programs.dsireusa.org/system/program/detail/182.
[241] *See*, U.S. Energy Information Administration, "Texas Energy Highlights," 4 December 2014, http://www.eia.gov/state/state_one_pager/Texas.pdf, p. 1; IEA, 2014a, 120.
[242] *See* for more information about the California renewables portfolio standard, especially legal and institutional issues, California Public Utilities Commissions, http://www.cpuc.ca.gov/RPS_Homepage/.
[243] *See*, U.S. Energy Information Administration, "California Energy Highlights," 10 December 2014, http://www.eia.gov/state/state_one_pager/California.pdf, pp. 1–2; IEA, 2014a, 120.
[244] *See* for an overview of the development of the legislation to regulate climate action and the energy sector, Jiang Xiaoyi, "Climate Change and Energy Law," in *Research Handbook on Chinese Environmental Law*, ed. Qin Tianbao (Cheltenham: Edward Elgar, 2015), 162–95.
[245] *See* for an overview of the history of the law, Hamrin, Jan, "China's New Renewable Energy Law: The California Connection," *Golden Gate University Law Review* 36, no. 3 (2006): 413–30; and for an assessment which obstacles the law faced, Cherni, Judith A., and Joanna Kentish, "Renewable Energy Policy and Electricity Market Reform in China," *Energy Policy* 35, no. 7 (2007): 3616–629.

are not allowed to "curtail" electricity generated from renewables. Thus, they were legally obliged to accept and transmit the purchased amount of electricity. Whether that was feasible and enforceable is not clear.

The Renewable Energy Law does not contain any specific target. Article 4 merely states that the state should consider the development and utilisation of renewable energy sources as a priority area. Article 8 stipulates that the State Council will develop a renewable energy plan, while government's at all administrative levels will issue renewables plans for their jurisdictions. The 12th Five-year Plan,[247] the government's socio-economic development programme for the period from 2011 to 2015, included the goal of 11.4% of non-fossil fuels in the country's total primary energy supply. After this goal was achieved, the 13th Five-year Plan (2016–2020) raised the target to 15% by 2020. Energy and climate policy goals of the 13th Five-year Plan were specified in the *Strategic Action Plan for Energy Development (2014–2020)*.[248]

In addition, based on the 12th Five-year Plan the State Council issued Document 26[249] on energy conservation and emission reductions. It proposes an ambitious target for the reduction of CO_2 emissions by about 11% in 2015, as compared to 2010 levels. This goal could not be achieved. Instead, energy-related carbon emissions increased by 11%.[250] The document lists reduction targets for every province-level entity. However, guidelines of how to achieve these targets remain vague.

With its 12th Five-year Plan, China's government also announced the gradual introduction of carbon emission markets. Carbon trading instruments should complement its energy and environmental policies. In 2011, the implementation of emission-trading schemes began with seven pilots, including the provinces Guangdong and Hubei and five municipalities (Beijing, Chongqing,

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[246] 中华人民共和国可再生能源法,已由中华人民共和国第十届全国人民代表大会常务委员会第十四次会议于 2005 年 2 月 28 日通过,现予公布,自 2006 年 1 月 1 日起施行。中华人民共和国主席令（第 33 号）中华人民共和国主席胡锦涛 2005 年 2 月 28 日 [Renewable Energy Law of the People's Republic of China, adopted at the 14th meeting of the Standing Committee of the tenth National People's Congress on 28 February 2005, and promulgated by order no. 33 of the President of the People's Republic of China Hu Jintao on 28 February 2005, to become effective on 1 January 2006].

[247] *Cf.* "十二五" 规划纲要 （全文 ）— 中华人民共和国国民经济社会发展第十二个五年规划纲要 ["12th Five-year plan" framework programme (complete text) – Framework programme of the 12th Five-year plan on the national socio-economic development of the People's Republic of China], 16 March 2011, http://www.china.com.cn/policy/txt/2011-03/16/content_22156007.htm.

[248] 国务院办公厅关于印发能源发展战略行动计划 （2014-2020 年） 的通知国办发［2014］31 号，2014 年 6 月 7 日 [Announcement by the Secretariat of the State Council on the publication and distribution of the Strategic action plan for energy development (2014–2020), 7 June 2014, State Council Secretariat document no. 31 [2014]. *See* also, State Council, http://www.gov.cn/zhengce/content/2014-11/19/content_9222.htm.

[249] 国务院关于印发"十二五"节能减排综合性工作方案的通知 国发［2011］26 号， 二〇一一年八月三十一日 [Announcement by the State Council on the publication of the comprehensive work programme on energy conservation and emission reduction as part of the 12th Five-year plan], 31 August 2011, State Council Secretariat document no. 26 [2011].

[250] The increase concerns energy-related carbon emissions in 2014 as compared to 2010 levels. In 2010, China's energy sector emitted 8,111 million metric tonnes of carbon dioxide. The sector emitted 9,018 million metric tonnes in 2014. *See*, U.S. Energy Information Administration, International Energy Statistics, http://www.eia.gov/beta/international/data/browser/ index.cfm#/?vs=INTL.44-1-AFRC-QBTU.A&vo=0&v=H&start=1980&end=2014.

Shanghai, Shenzhen, and Tianjin). The emission markets started trading between 2013 and 2014. They should lay the foundation for a national carbon-emission trading system. These provincial and municipal schemes were governed by different legal instruments and varied with respect to their allocation approaches, the degree of market intervention, and legal instruments.[251]

The pilots covered emissions from electricity generation, but the design of the accounting mechanisms varied. All trading schemes included compliance mechanisms, but the strength of enforcement measures also varied.[252] The approach of the Chinese pilots differed from the EU ETS and California's emission trading system that covered emissions of installations or facilities. The Chinese pilots covered emission sources at enterprise levels.[253] By 2014, the pilots covered more than 2,000 enterprises. Thus, the allowances were not used for specific installations but spread across the entirety of an enterprise's operations. The experiences gained in these pilots informed the design of a national emission trading system from 2017 onwards.[254] The establishment of the national emission-trading scheme was announced in January 2016.[255] It was unclear whether this scheme, if implemented nation-wide, would be able to generate price signals in an environment of vastly available government support for the deployment of renewables.[256]

Generally, China's power sector faced great challenges in implementing low-carbon policies. By the mid-2010s, the renewables sector had expanded significantly. Still, the share of renewables in China's electricity mix could only increase piecemeal, mainly because the fleet of coal-fired power plants expanded significantly during the period of 2000 and 2010. In 2013, hydropower and nuclear power held shares of 22% and 1%, respectively, in China's installed electricity capacity. Other renewable sources accounted for a total of 8% – with wind power making up 6%, solar 1%, and

[251] The people's congresses of Beijing and Shenzhen issued specific regulations. Shanghai, Guangdong, and Hubei relied on government orders, while Tianjin and Chongqing issued normative documents through government notices. *See* for an assessment of these institutional differences, Duan et al, "Review of Carbon Emissions Trading Pilots in China," *Energy and Environment* 25, nos. 3–4 (2014): 527–49.

[252] Song et al, "Assessing Implementation of China's Climate Policies in the 12th 5-year Period," World Resource Institute Working Paper, September 2015, https://www.wri.org/sites/default/files/15_WP_China_Climate_Policies_final-v2_0.pdf, pp. 29–31.

[253] Zhang Zhongxiang, "Crossing the River by Feeling the Stones: The Case of Carbon Trading in China," *Joint Implementation Quarterly* 21, no. 1 (2015): 4.

[254] *See* for an evaluation of the functioning of the market during their first compliance period of the pilot schemes, Zhang Zhongxiang, "Carbon Emission Trading in China: The Evolution from Pilots to a Nationwide Scheme," *Climate Policy* 14, no. sup1 (2015): 104–26; for an overview in the context of international experiences see, Dong et al, "From Pilot to the National Emissions Trading Scheme in China: International Practice and Domestic Experiences," *Sustainability* 8, no. 6 (2016): 1–17.

[255] 中华人民共和国国家发展和改革委员会 —国家发展改革委办公厅关于切实做好全国碳排放权交易市场启动重点工作的通知, 发改办气候［2016］57 号, 2016 年 1 月 11 日 [National Development and Reform Commission of the People's Republic of China – Announcement by the Secretariat of the National Development and Reform Commission on the commencement of priority work to realistically accomplish the establishment of a national carbon emission certificate market, 11 January 2016, Climate Bureau of the Secretariat of the National Development and Reform Commission document no. 57 [2016]. *See* also, National Development and Reform Commission, http://www.sdpc.gov.cn/gzdt/201601/t20160122_ 772150.html.

[256] *See* for the fate of the carbon trading scheme section 8.2. of chapter eight.

biomass 1%.[257] Although the deployment of renewables in the power sector developed quickly, the amount of electricity that was produced from these resources did not replace fossil-fuel-based power generation. Thus, the remarkable increase in installed renewable capacity could not contribute to a limitation of carbon emissions.

Furthermore, the utilisation of renewable energy sources faced considerable constraints. Initially, their integration into the existing grid was problematic. Due to rising overcapacity of the total power production, wind and solar power producers struggled to access the grid.[258] In fact, by 2016 China was the world leader in renewable energy investment, but it wasted about 21% of its wind energy on a national level. In some provinces, even up to 40% of the wind energy was "curtailed," [259] as the grid was unable to transmit the electricity to demand centres, or wind power was too expensive compared to other supplies.[260] These problems point to the more technical side of decarbonising the power sector – i.e. regulating and administering the inter-regional interconnection of power networks. The next subsection summarises how the EU, U.S., and China addressed these problems.

5.3.2.2. Regulating transmission and regional market interconnection

The preceding subsection showed that climate measures in the electricity sector focus on emission trading and the deployment of renewables. To utilise new technologies more cost-effectively, the integration of electricity networks is vital. However, the regulation of such cooperation is cumbersome and many technical and political obstacles have to be overcome. Moreover, huge investments are needed to build the physical infrastructure. By the mid-2010s, the EU, U.S., and China had just embarked on this big transformation.

A) European Union

In the European Union, legislation to establish the internal market for electricity covered efforts to link national electricity networks and regulate cross-border grid access. Interconnection was principally considered a precondition for increasing efficiency and competition in the internal market.

[257] U.S. Energy Information Administration, "International Energy Data and Analysis: China," 14 May 2015, http://www.eia.gov/beta/international/analysis_includes/countries_long/China/china.pdf, p. 29.
[258] China's Wind Association, for instance, threatened to sue the provincial governments of Gansu, Yunnan, and Xinjiang, because of explicit curbs on wind power in local grids. The central government's National Energy Administration had reiterated the need to accept all renewables-based electricity. Yet, local grid operators asked wind power generators to curtail production amid increasing supply. *See*, for instance, Shepherd, Christian, and Lucy Horby, "China Wind Energy Groups Cry Foul over Grid Curbs," *Financial Times*, 31 March 2016.
[259] Curtailment rates indicate the amount of electricity that cannot access the grid.
[260] Gordon, Kate, and Anders Hove, "How China Wastes Its Renewable Energy," *Wall Street Journal*, 13 September 2016.

In 2002, the European Council agreed a target for member states of "a level of electricity interconnections equivalent to at least 10% of their installed production capacity by 2005."[261] As part of the 2009 Third Energy Package, Regulation 714/2009 provided rules and mechanisms to govern regional transmission systems.[262] The European Commission promoted the interconnection of grids in order to increase competition in the power sector. With the deployment of increasing amounts of renewables in the power generation, interconnection became inevitable in order to be able to cope with intermittent power supplies inter-regionally.

Coordinated planning of interconnectors involved the European Network of Transmission System Operators for Electricity (ENTSO-E), the European Commission, and other key stakeholders. The first Ten-Year Network Development Plan[263] was published in 2010. It entailed 500 investment projects. Up to €28 billion should be spent during the first five years of the plan.[264] Furthermore, in 2010 a comprehensive review of the energy infrastructure priorities for the coming decade reassessed the need for transmission lines and interconnectors. The European Commission proposed four priority corridors "to ensure timely integration of renewables generation capacities in Northern and Southern Europe and further market integration."[265] Regulation 347/2013 was the legislative follow-up to this proposal.[266]

According to its Article 1, Regulation 347/2013 "lays down guidelines for the timely development and interoperability of priority corridors and areas of trans-European energy infrastructure."[267] Yet, to be able to achieve this aim Regulation 347/2013 called for more harmonisation and a transfer of competences to the European Commission by stating that "in order to ensure uniform conditions for the implementation of the relevant provisions of Regulation (EC) No 714/2009 […] implementing powers should be conferred on the Commission."[268] Hence, the push for more centralisation of policy and rule making at the Union level, which shaped the evolution of

[261] Presidency Conclusions, "Barcelona European Council, 15 and 16 March 2002," 15–16 March 2002, SN100/1/02 REV 1, p. 15.
[262] Regulation (EC) No. 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003, OJ L 211, 14.8.2009, pp. 15–35.
[263] Ten-Year Network Development Plans are issued every two years. The European Network of Transmission System Operators for Electricity (ENTSO-E) bases the development of the plans on national plans and includes specific regional investment plan. *See* in more detail, ENTSO-E, "The Ten-year Network Development Plan," https://www.entsoe.eu/major-projects/ten-year-network-development-plan/general/Pages/default.aspx.
[264] *See* for more details on the plan and the implementation of the projects, ENTSO-E, "Ten-year Network Development Plan 2010," https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-2010/Pages/default.aspx.
[265] European Commission, "Energy Infrastructure Priorities for 2020 and beyond: A Blueprint for an Integrated European Energy Network," 17 November 2010, COM(2010) 677 final, p. 10.
[266] Regulation (EU) No. 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009, OJ L 115, 25.4.2013, pp. 39–75.
[267] Annex I of Regulation 374/2013 lists four priority electricity corridors – i.e. North Seas Offshore Grid (NSOG), North-South Electricity Interconnections in Western Europe (NSI West Electricity), North-South Electricity Interconnections in Central Eastern and South Eastern Europe (NSI East Electricity), and Baltic Energy Market Interconnection Plan in Electricity (BEMIP Electricity).
[268] Regulation (EU) No. 347/2013, recital 18.

market regulation, the EU ETS, and renewable energy legislation, also accompanied efforts to regulate electricity infrastructure development. However, as already mentioned in subsection 5.3.1.2., regional approaches facilitated the implementation of interconnection plans.[269]

The European Regulators Group for Electricity and Gas launched the Electricity Regional Initiatives in 2006.[270] Regional initiatives were considered pivotal in establishing the internal electricity market.[271] Thus, the further integration of the EU electricity market would be based on these regional initiatives, which by the mid-2010s had already been dealing with practical issues of cross-border electricity for years, including the balancing of variable electricity flows from wind or solar power installations.[272]

The projects that centred on the priority corridors of Regulation 347/2013 would be given the status of "projects of common interest." This status should ensure that related administrative procedures were smoothened under the national laws of the EU member states.[273] By 2015, most of these projects were transmission lines (90%). Storage facilities accounted for 8%; and 2% of the projects concerned smart grids. When the Agency for the Cooperation of Energy Regulators assessed the progress of the common-interest projects, it concluded that more than half of these projects were behind schedule. In the majority of the cases, delays or rescheduling resulted from permitting procedures, mainly related to environmental issues.[274]

Soon after the announcement of the 2015 Energy Union, work on new proposals for revised electricity market legislation began.[275] Subsequently, in late 2016 the European Commission issued a proposal for a new legislative package – entitled "Clean Energy for All Europeans"[276] – that would repeal and "recast" the electricity legislation of the 2009 Third Energy Package. The essence of this

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[269] The Pentalateral Forum is a case in point. The interconnection of the national grids of France, Belgium, the Netherlands, Luxembourg, Germany, and Austria is discussed and coordinated among relevant stakeholders, facilitated by regular meetings of members states' representatives. *See*, Handke, 2018, 292–5.

[270] In 2006, European Regulators Group for Electricity and Gas established seven Electricity Regional Initiatives – i.e. the Baltic, Central-East, Central-South, Central-West, Northern, South-West, and France-UK-Ireland regions. *See*, Council of European Energy Regulators/European Regulators Group for Electricity and Gas, "The Regional Initiatives: A Major Step towards Integrating Europe's National Energy Markets," December 2010, http://www.ceer.eu/portal/page/portal/EER_HOME/ EER_ACTIVITIES/EER_INITIATIVES/FS-10-03_RegionalInitiatives_2010-12_v10OK.pdf, p. 5; *see* also, Agency for the Cooperation of Energy Regulators (ACER), "Regional Initiatives," http://www.acer.europa.eu/en/Electricity/Regional_initiatives/Pages/ default.aspx.

[271] *See*, European Commission, "Energy Infrastructure Priorities for 2020 and beyond," 17 November 2010, pp. 13–4.

[272] Boot et al, "Reflections on Coordination Mechanisms: For Accommodating Increasing Amounts of Wind and Solar in the Power Market," CIEP Paper no. 5, 2014, http://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2014-reflections-on-coordination-mechanisms_01588.pdf, p. 68.

[273] Regulation (EU) No. 347/2013, recital 28.

[274] Agency for the Cooperation of Energy Regulators (ACER), "Consolidated Report on the Progress of Electricity and Gas Projects of Common Interest," 22 July 2015, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ Consolidated% 20report%20on%20the%20progress%20of%20electricity%20and%20gas%20Projects%20of%20Common%20Interest.pdf, pp. 39–42.

[275] European Commission, "A Framework Strategy for a Resilient Energy Union with a Forward-looking Climate Change Policy," 2015, pp. 10, 20.

[276] *See* for an overview of this legislative package, European Commission, "Clean Energy for All Europeans Package," 12 March 2020, https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en.

new package with respect to the electricity sector was the adaptation of EU market rules to more variable and decentralised electricity generation, increased interdependence between the member states, and new technologies to enable consumers to actively participate in the electricity market. The legislation was adopted and published in 2019.[277]

B) United States

Compared with EU legislation, the U.S. relied on a different approach to grid interconnection and expansion of transmission systems. While the European Commission issued centralised legislation packages to promote regional integration efforts, the Federal Energy Regulatory Commission (FERC) could merely facilitate bilateral discussions between balancing regions and regional transmission organisations (RTOs).[278] In fact, the fragmented and overlapping jurisdictions impeded the development of the grid. In addition to difficult geographical and physical circumstances, the fragmented nature of the grid thus posed a great challenge to both the integration of renewables and the efficient coordination of gas and power infrastructure.[279]

Independent system operators and regional transmission organisations[280] administered the transmission grid on a regional basis. FERC regulated the regional transmission organisations. The transmission grid traditionally consisted of eight regions that were overseen by the North American Electric Reliability Corporation (NERC). In the U.S., three interconnectors linked regional grids – i.e. the Eastern, Western, and Texas interconnection.[281] Within these three large interconnected systems, regional transmission organisations and independent system operators managed the transmission systems. The Western and Texas interconnected systems were both linked with Mexican grids, while the Eastern and Western interconnected systems were completely integrated with most of Canada or linked to the Quebec power grid. By the mid-2010s, following the deregulation of wholesale markets cross-border trade had become a significant factor in meeting domestic electricity requirements.[282]

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[277] *See* for a brief discussion, section 8.2. of chapter eight.
[278] IEA, 2016b, 183.
[279] Ibid., 178.
[280] Regional transmission organisations (RTOs) were independent, membership-based non-profit organisations. They ensured the reliability of the power supply. In 2009, RTOs managed 60% of the power supplied to load-serving entities. They first evolved in the 1990s following FERC policies to encourage competition in the electricity market by opening up transmission lines. *See*, U.S. Energy Information Agency, "About 60% of the U.S. Electric Power Supply Is Managed by RTOs," *Today in Energy*, 4 April 2011, http://www.eia.gov/todayinenergy/detail.php?id=790.
[281] *See* for more detail and a map of the interconnections and balancing areas, U.S. Energy Information Administration, "U.S. Electric System is Made up of Interconnections and Balancing Authorities," *Today in Energy*, 20 July 2016, http://www.eia.gov/todayinenergy/detail.php?id=27152.
[282] IEA, 2014a, 57.

By amending the Federal Power Act, the 2005 Energy Policy Act authorised the U.S. Secretary of Energy to select and designate geographic areas as "National Interest Electric Transmission Corridors." In 2007, two national corridors were chosen – i.e. the Mid-Atlantic Area and the Southwest Area National Corridors.[283] Since in these areas consumers suffered from transmission capacity constraints and congestion, state authorities, together with the FERC, had to decide on how to improve the transmission situation. Subsequently, filings for transmission applications increased. Next to economic and financial incentives, the promotion of renewable portfolio standards in many federal states contributed to this development. Yet, the "threat" of FERC interference as a potential backstop also played a significant role.[284]

In 2007, FERC Order 890[285] had been enacted. It sought to promote regional cooperation on planning and initiating new transmissions projects. In 2011, FERC Order 1000[286] amended FERC Order 890, requiring public utility transmission providers to participate in the regional planning processes to set up regional transmission plans. Accordingly, federal rules increasingly intervened in the development of the transmission system.

Still, the U.S. power sector remained captured between federal and state level decision and law making. The federal government tried to promote energy transition policies by executive orders, while federal states were reluctant to give up decision-making powers. The case of Texas is particularly illustrative. The Electric Reliability Council of Texas (ERCOT)[287] evolved from a response of some Texas utilities to the 1935 Federal Power Act. They were determined to isolate their businesses from inter-state commerce to avoid any federal interference.[288] By the mid-2010s, the Texas grid was still largely isolated from other transmission systems.[289] Therefore, ERCOT solely administered the Texan transmission network and was independent of FERC rules.

To utilise wind power, a provision in the Texas Administrative Code[290] created competitive renewable energy zones. Since these zones were mainly located in western Texas, a plan was made to connect wind power facilities with the main centres of consumption in Texas. Subsequently, about

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[283] U.S. Department of Energy, "DOE Affirms National Interest Electric Transmission Corridor Designations," 6 March 2008, https://energy.gov/oe/articles/doe-affirms-national-interest-electric-transmission-corridor-designations.

[284] Swanstrom, Debbie, and Meredith M. Jolivert, "DOE Transmission Corridor Designations and FERC Backstop Siting Authority: Has the Energy Policy Act of 2005 Succeeded in Stimulating the Development of New Transmission Facilities?," *Energy Law Journal* 30, no. 2 (2009): 458–65.

[285] FERC Order No. 890, Preventing Undue Discrimination and Preference in Transmission Service, 16 February 2007.

[286] FERC Order No. 1000, Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities, 21 July 2011.

[287] ERCOT was established in 1970. It was the successor of the Texas Interconnected System. It constitutes an intrastate electricity interconnection that is not subject to FERC jurisdiction.

[288] IEA, 2014a, 62.

[289] *See* on the benefits of this isolation for the development of a future climate programme deployment, Friedland, James D., "The 'Lone Grid' State: Texas as the Ideal Location for State-level Climate Regulation," *Columbia Journal of Environmental Law* 39, field reports (2013): 49–58.

[290] Texas Administrative Code – Rule §25.174, 4 January 2007.

100 projects extended the transmission system.[291] On the one hand, Texas was able to substantially promote the low-carbon transition of its own power sector. On the other hand, it was reluctant to contribute to efforts employed by the federal level to mirror this achievement nation-wide. Hence, the electricity grid in the U.S. remained fragmented, impeding greater cost-effectiveness in the context of renewables deployment.

C) China

The Chinese power sector also faced considerable geographical[292] and institutional challenges, albeit of a different nature. These challenges became apparent when the first attempts were made to better interconnect its six regional power grids.[293] Each of these regional grids covered several provinces, autonomous regions, or municipalities. They were mainly administered by two state-owned grid companies – i.e. State Grid Corporation (State Grid) and China Southern Power Grid. The 2002 *Plan to reform the structure of the power industry*[294] urged the stakeholders to build interconnections within the national grid.[295] By the mid-2010s, State Grid had started to build ultrahigh-voltage (UHV) transmission lines to create a backbone network that could link geographically distant energy bases in the northwest and north of the country with the load centres in the east and south.[296]

In 2004, State Grid began to develop this endeavour without any government plan that envisioned the utilisation of UHV transmission technology in China's transmission grid. The development of the UHV lines was a pet project of the State Grid's CEO, Liu Zhenya, and aimed to establish State Grid as a standard-setting company in the global transmission industry. After State Grid began to develop the UHV transmission technology, it gradually gained support among the relevant institutions of the central government. The first experimental UHV project was eventually approved by the National Development and Reform Commission, China's central economic policy

[291] IEA, 2016b, 188.

[292] Most resources for electricity production are concentrated in the north and northwest of China. This concerns both its endowment with fossil fuels and the availability of wind and solar power. The main load centres are the economic centres in the east and south as well as the populous central part of China.

[293] The Chinese power sector consists of six major grids – i.e. Northeast China, North China, Northwest China, Central China, East China, and South China Power Grids.

[294] 电力体制改革方案（国务院 2002 年 2 月 10 日发布国发［2002］5 号）[Plan to reform the structure of the power industry (State Council, 10 February 2002, State Council document no. 5 [2002]).

[295] State Council document no. 5 [2002], para 5.

[296] This interconnection was made possible by the completion of the Three Gorges Power Grid, as it enabled the interconnection of the surrounding power grids. *See*, Davidson, Michael, "Politics of Power in China: Institutional Bottlenecks to Reducing Wind Curtailment through Improved Transmission." *Energy Forum*, no. 4 (2013): 40; Pittman, Russell, and Vanessa Yanhua Zhang, "Electricity Restructuring in China: How Competitive Will Generation Markets Be?," *The Singapore Economic Review* 55, no. 2 (2010): 383.

body. The first UHV line was approved in 2006. It stretched 650 km from Shanxi Province to Hubei Province.[297] The first lines became operational in 2009. In 2013, UHV projects eventually became part of the central government policies.[298] Subsequently, State Grid invested heavily in the construction of UHV lines in China. Investments steadily rose from RMB 87 billion (€11 billion) in 2004 to RMB 452 billion (€58 billion) in 2015.[299]

The long-distance UHV transmission lines became a means to tackle air pollution in industrial and population centres, such as the Beijing-Tianjin-Hebei region. This would allow the closure of coal-fired power plants in this region and partially substitute the electricity with renewable electricity produced in western parts of the country. Thus, the State Council approved new UHV lines in early 2014.[300] The deployment of UHV lines fundamentally changed the supply patterns in industrial load centres in eastern China, such as Jiangsu Province, Zhejiang Province, and Shanghai.[301] However, State Grid struggled to ensure stable and reliable supplies, because during peak demand periods these large industrial and population centres relied for up to 40% on remote supplies.[302]

Nevertheless, overall low transmission capacity remained a big obstacle to fully utilising growing amounts of wind and solar power, despite the fact that inter-regional electricity trading increased during the 2010s. Mismatches of supply and demand continued to occur regularly. Power supply surpluses in western Inner Mongolia and northeast and northwest China often coincided with shortages in the eastern and central parts of the country.[303] Moreover, most of the newly built inter-regional transmission lines only interconnected two regions. This could not contribute to the stabilisation of power markets, as neighbouring regions generally displayed the same demand and supply patterns. With the construction of inter-regional transmission lines the central government wanted to ensure stable and cost-effective supplies in all parts of country. By 2015, this objective had only partly been achieved.[304]

The 12th Five-year Plan (2011–15) had proposed far-reaching targets with respect to the deployment of renewable energy sources. By 2020, a share of 15% of final energy consumption

[297] Xu, 2017, 201–9.
[298] Ibid., 215–6.
[299] Ibid., 216.
[300] Ibid., 215.
[301] Ibid., 216.
[302] Ibid., 220.
[303] Zeng et al, "Trans-regional Electricity Transmission in China: Status, Issues, and Strategies," *Renewable and Sustainable Energy Reviews* 66 (2016): 575.
[304]The implementation lacked a clear focus on urgent connections. For instance, much needed interconnection between Inner Mongolia and eastern China could not be realised, while an interconnection between Shanxi and Hubei was built – two provinces that both display the same demand and supply patterns. Furthermore, lengthy debates about the technology that should be deployed for the transmission lines caused a delay in the implementation of the programme. The allocation of costs and benefits also seemed flawed in some cases. *See*, Zeng et al, 2016, 576, 581.

should originate from renewables, including nuclear power. However, no specific target was set for the power sector.[305] The China Electricity Council, a business association, analysed the plan and other related government documents. It concluded that this increase of non-fossil fuels in China's final energy consumption would result in a share of 12.4% in the electricity mix. The China Electricity Council thus emphasised the need to maintain a competitive price for electricity in order to successfully integrate renewables into the existing grid. Moreover, the discrepancy between the development of electricity generation bases and the insufficient expansion of the transmission network called for a fast response. Finally, the council stressed the need for further market reforms in the sector and for improvement of the sector's legal framework.[306]

The goals of the 12th Five-year Plan were ambitious and not grounded in the realities of China's electricity system.[307] Consequently, the power sector had to deal with various distortions during the plan's implementation period. Half-hearted market reforms of during the first decade of the century and the persistence of planned-economy institutions had created an inflexible electricity system,[308] both with respect to technical issues and economic interactions.[309] Furthermore, the fast expansion of China's power sector since the turn of the century largely relied on decentralised investment and operational decision-making within a framework of centralised planning and rate setting. The centralised regulatory structure increasingly clashed with decentralised decision-making processes,[310] leading to parallel policy agendas and inconsistencies. In fact, sub-national policymakers were not willing to relinquish their influence on vital local economic matters. Since China did not develop federal and independent legal institutions to govern and balance interactions between different levels of government, the power sector essentially lacked a well-functioning legal framework. However, efforts to resolve this mismatch would take decades.[311]

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[305] Yet, the electricity sector was the only component of China's energy sector that could be expected to integrate large amounts of non-fossil energy during the decade from 2010 to 2020. *See*, Kahrl et al, "Challenges to China's Transition to a Low Carbon Electricity System," *Energy Policy* 39, no. 7 (2011): 4036.

[306] China Electricity Council, "中电联发布电力工业'十二五'规划滚动研究综述报告" [China Electricity Council report on an overview of research on the implementation of the '12th Five-year plan' in the electricity sector], 9 March 2012, http://www.cec.org.cn/yaowenkuaidi/2012-03-09/81451.html.

[307] Kahrl et al, 2011 4032.

[308] The National Development and Reform Commission (NDRC) remained responsible for sector planning, project approval, and rate setting. The NDRC is China's main economic policy making agency under the central government.

[309] Between 1980 and 2009, China's economy developed rapidly. Electricity supply had to keep up with high annual economic growth rates. During this period, China's electricity demand grew 12-fold. This fast growth was accompanied by severe capacity shortages, while system reliability became the main focus of regulatory agencies. Meeting demand was the paramount objective of reform efforts. *See*, Kahrl et al, 2011, 4033.

[310] During the 1980s, the central government devolved much decision-making power on provincial and county levels. The fast economic development of the country from the mid-1980s onwards relied on sub-national initiatives and policymaking. Provincial-level control of essential energy assets steadily grew during the reform period. *See* for an overview of central-provincial interactions. *See*, Ma Chunbo, and He Lining, "From State Monopoly to Renewable Portfolio: Restructuring China's Electric Utility," *Energy Policy* 36, no. 5 (2008): 1700.

[311] Kahrl et al, 2011, 4039–40.

Document 9 on *Some opinions regarding the further deepening of the power sector reform* that the Communist Party leadership and the State Council jointly issued in 2015 stressed the need to further reform the electricity sector. Urgent reform measures that were mentioned included the establishment of inter-provincial short-term electricity exchanges, the improvement of network interconnections, and the rule-based administration of the electricity sector.[312] Hence, by the mid-2010s the low-carbon transition of China's power sector had begun, but it developed within a weak institutional and legal environment.

5.3.2.3. Concluding remarks

The decarbonisation of the power sector is a complex technological and multi-layered legal and administrative endeavour. It is beyond the scope of this chapter to provide an in-depth study of the efforts in the EU, U.S., and China in this regard. This overview sought to illustrate that the low-carbon transition gradually evolved and has gained ground in these three parties to the UN climate regime since the turn of the century. Government intervention was continuously necessary in order to adjust the direction of the transformation to changing political and economic circumstances, societal preferences, and technological progress.

The survey of low-carbon measures in the three jurisdictions revealed three crucial characteristics of this transformation. First, guidance and involvement of the central legislative and executive levels – the European Commission, the U.S. federal government, and China's State Council – seemed to be vital for progressing the low-carbon transition in a timely manner. Second, the quality of the regulatory and legal environment was an essential factor for providing legal certainty for investors, for taking into account environmental standards, and for protecting consumer rights. Third, the trend towards the centralisation of decision-making and regional integration through the interconnection of grids as well as the integration of renewable electricity were vital institutional adjustments that helped to realise the low-carbon transition in a cost-effective way.

The development of the electricity sector's transmission and distribution component in all three jurisdictions showed how the functioning of institutions related to the development of transmission (and interconnection) capacity. Furthermore, the study of the three jurisdictions highlighted that the regulation of the low-carbon transition evolved from the framework that the

[312] 关于进一步深化电力体制改革的若干意见（中共中央国务院 2015 年 3 月 15 日发布中发［2015］9 号）[Some opinions regarding the further deepening of the power sector reform (Central Committee State Council, 15 March 2015, Central Committee document no. 9 [2015])].

market liberalisation of the fossil-fuel based electricity sector had already introduced. Indeed, the role of rules and institutions and the endurance of the fossil economy are relevant for conceptualising the process of decarbonising electricity generation, which is the topic of section 5.4. The last subsection of this section summarises the nationally determined contribution that the EU, U.S., and China submitted to the UNFCCC registry ahead of COP-21 in Paris in 2015.

5.3.3. Big emitters' first NDCs

The preceding subsections provided an overview of the regulation and state of the power sector in the EU, U.S., and China until 2015. During the first half of that year, the parties to the UNFCCC submitted their first nationally determined contributions (NDCs) to the UNFCCC registry[313] ahead of the adoption of the Paris Agreement (hereafter through chapter seven PA) in December of that year. In 2014, COP-20 had adopted the Lima Call for Climate Action that invited the parties to submit their NDCs by taking into account the objective of Article 2 UNFCCC.[314]

The NDCs would form the starting point from which the parties would proceed with the submission of their successive NDCs under the PA. The ultimate objective of the PA is to keep global warming "well below 2°C above pre-industrial levels."[315] Pursuant to Article 4 (2) PA, the parties are legally bound to "prepare, communicate and maintain successive nationally determined contributions."

The NDCs themselves are not legally binding. The parties are not obliged to fulfil their substantive content. However, Article 13 (5) PA includes a transparency framework that aims to help inform the parties about the progress of individual parties regarding the implementation of their NDCs.[316] The next chapter will discuss the mitigation provisions of the PA. The following summary of the NDCs, which the EU, U.S., and China submitted in 2015, aims to highlight the link that these parties made between domestic electricity laws and regulation and the UN climate regime and its objective. The contemporaneous assessments of the NDCs that the IEA made – by considering "NDC scenarios" – help to situate the NDCs in the energy debate around 2015.

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[313] *Cf.* UNFCCC, "NDC Registry," https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx.
[314] Lima Call for Climate Action, Decision 1/CP.20 (FCCC/CP/2014/10/Add.1), 2 February 2015, para 9.
[315] Article 1 (a) PA.
[316] *See* for an in-depth assessment of the mitigation provisions of the Paris Agreement and the guidelines for their implementation in the Katowice Rulebook, section 7.3. of chapter seven.

5.3.3.1. European Union

The EU submitted its NDC jointly for all member states in March 2015. It committed to "a binding target of an at least 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990." [317] According to the submission, the EU puts forward the package of energy and climate legislation that had already been adopted to implement the 2020 energy and climate goals. In addition, the submission announces that during the period from 2015 to 2016 new legislation will be drafted to implement the 2030 emissions reduction goals that are part of the submission.[318]

The submission stresses that the 2030 target constitutes "a significant progression" beyond the goals for 2020 that aimed to achieve a reduction of 20% compared to 1990. The 2030 target is thus in line with the EU objective "to reduce its emissions by 80–95% by 2050 compared to 1990." Furthermore, the submission emphasises that the EU member states have already reduced their emissions by about 19% on 1990 levels, while the GDP grew by more than 44% during that period.[319]

In the same year (2015), the IEA published an assessment based on the EU submission with some conclusions for the development of the EU energy sector. Accordingly, the EU NDC scenario reflects a re-orientation of the EU energy sector that was already underway at that time. The share of low-carbon energy sources would grow from 27% of primary energy demand (2013) to 37% in 2030.[320]

Electricity demand in the EU would increase by about 10% by 2030 in this NDC scenario. The residential and services sectors were largely responsible for this increase, while the demand in the industrial sector would decline during the 2020s. By 2030, renewables would form more than 50% of the Union's power generation capacity. Coal-fired capacity would decline by almost 40% to 120 gigawatts (GW), while gas-fired capacity would increase by 30% to 30 GW. As a result of these changes, the carbon intensity of the electricity sector would halve by 2030. Since this scenario predicted that about 25% of the total generation by that time would rely on variable renewables (wind and solar power), investments in greater levels of interconnection and an upgrading of the distribution networks were considered necessary.[321] Thus, the integration of the common market for electricity would continue to be central to EU energy policies, including the low-carbon transition. The policy fields of energy and climate were expected to increasingly converge, while the member

[317] Latvian Presidency of the Council of the European Union, "Submission by Latvia and the European Commission on behalf of the European Union and Its Member States," 6 March 2015, https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/European%20Union%20First/LV-03-06-EU%20INDC.pdf, p. 1.
[318] Ibid., p. 3.
[319] Ibid.
[320] International Energy Agency (IEA), *World Energy Outlook Special Report: Energy and Climate Change*. Paris: OECD/IEA, 2015b, 47.
[321] Ibid., 47–8.

states faced the daunting institutional and technical task of further interconnecting their electricity sectors, in order to facilitate the low-carbon transition of the European electricity sector.

5.3.3.2. United States

The NDC that the U.S. submitted in March 2015 included the intention to achieve an economy-wide target of a 26% to 28% reduction of greenhouse gas emissions below 2005 levels in 2025. The submission also announced "to make best efforts to reduce its emissions by 28%."[322] The submission stresses that the U.S. is on a path to achieve the 2020 target of reducing emissions by 17% below the 2005 level. Furthermore, the submission emphasises that the 2025 target is consistent with "a path to deep decarbonization" and a "pathway from 2020 to deep, economy-wide emission reductions of 80% or more by 2050."[323]

The submission continues by highlighting that existing laws, regulations, and other domestically mandatory measures "are relevant to the implementation of the target."[324] These laws are the Clean Air Act, Energy Policy Act, and the Energy Independence and Security Act. It also mentions that under the Clean Air Act regulations to cut carbon pollution from new and existing power plans would be finalised by the summer of 2015.[325]

The IEA assessment estimates that by 2013 the U.S. had already accomplished about 35% of the way towards the lower 26% emissions reduction target for 2025. Thus, to some degree, it had already achieved a certain level of emissions reductions by 2013. About 60% of these reductions came from the power sector. This was mainly the result of switching from coal to natural gas and the increasing deployment of renewables.[326] Further reductions in emissions from the entire energy sector would be necessary to meet the 2025 target. It would be possible to achieve the 26% target by proceeding on the same pace as the year prior to 2013. The U.S. would then accomplish the highest energy-related CO_2 emissions reduction of any country during the period from 2013 to 2025. However, its per capita emissions would remain among the highest in the world.[327]

The Clean Power Plan[328] would result in 856 million tonnes lower CO_2 emissions from the power sector in 2025 (compared to 2005), together with efforts to improve power sector efficiency and

[322] United States, "Nationally Determined Contribution," 25 March 2015, https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/United%20States%20of%20America%20First/U.S.A.%20First%20NDC%20Submission.pdf, p. 1.
[323] Ibid., 1–2.
[324] Ibid., 2.
[325] Ibid., 5.
[326] IEA, 2015b, 42.
[327] Ibid., 43.
[328] *See* for a brief discussion of the developments relating to this plan, section 8.2. of chapter eight.

reducing electricity demand through efficiency measures applied to electricity consuming industries and households. In the NDC scenario, coal-fired capacity would decline by more than 20% by 2025, [329] while coal's share of total electricity generation would drop by 17% to 23% of the total. Half of the share would then switch to gas and the other half to renewables-based electricity. Thus, in the U.S. low-carbon electricity generation would increase from 30% to 40% by 2025.[330] Market trends had been changing since the first decade of the century. These trends were, at least in part, instigated by low-carbon legislation at the state level. Thus, given the forecasts in the NDC scenario, these trends would continue to restructure the fuel mix of the U.S. electricity sector and decrease CO_2 emissions.

5.3.3.3. China

China submitted its NDC in June 2015. The submission stated that the by 2014 China's carbon intensity was 33.8% lower than in 2005.[331] It continues and gives an overview of the installed capacity of on-grid wind power (95.81 GW) and solar power (28.05 GW), which was 90 times and 400 times more than the 2005 numbers, respectively.[332] The submission goes on and lists the actions planned for 2030, including achieving a peaking of CO_2 emissions, 60% to 65% lower carbon intensity of economic activity (compared to 2005), and an increase of non-fossil fuels in the primary energy consumption.[333]

The submission announces that China will "strengthen laws and regulations on climate change."[334] It will also formulate a "long-term strategy and roadmap for low-carbon development."[335] In the energy sector, China wants to "control" its total coal consumption, "enhance the clean use of coal," and "increase the share of concentrated and highly-efficient electricity generation from coal."[336] The measures also include the increased use of hydropower as well as nuclear, wind, and solar power. Moreover, the submission mentions the plan to establish carbon emissions trading pilots and to expand these pilots into a national scheme.[337]

[329] IEA, 2015b, 44.
[330] Ibid., 45.
[331] 中国国家发展和改革委员会应对气候变化司 [Department of climate change, National development and reform commission of China], "强化应对气候变化行动 — 中国国家自主贡献" [Strengthening climate action: China's nationally determined contribution], 30 June 2015, https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/China%20First/ China%27s%20First%20NDC%20Submission.pdf, p. 3.
[332] Ibid., 3–4.
[333] Ibid., 5.
[334] Ibid., 6.
[335] Ibid.
[336] Ibid., 7.
[337] Ibid., 14.

The IEA estimates that in the NDC scenario China would remain the world's largest consumer and producer of coal through 2030. During the 2020s, China's coal consumption would grow modestly, but would not show any significant sign of decline by 2030. In addition, both China's oil and natural gas demand will continue to rise.[338] The share of non-fossil fuels in the total primary energy demand would increase from 10% (2013) to about 20% in 2030. [339]

In the NDC scenario, China's electricity demand would increase by 75% by 2030. China's electricity demand would then be twice the level of demand compared with the U.S., the second-largest global electricity market by 2030.[340] China would account for 65% of global growth in nuclear capacity. Renewables would also grow rapidly, led primarily by hydropower, wind and solar power. Wind power would grow by 220 GW and solar power by 155 GW.[341]

The projected level of China's CO_2 emissions means that it will be the major determinant of the international community's chances of success in limiting global warming to 2°C. The efforts of the rest of the world will depend on China's decisions regarding early retirements, mothballing or life extension of some of its coal-fired power plants.[342] Given the fact that most of China's coal-fired power plants have only been completed after 2000, they could potentially still be producing electricity long after 2030. Accordingly, the IEA projects that 95% of China's coal-fired power generation capacity that existed during the 2010s would still be in operation in 2030, as well as an additional 345 GW of new coal-based capacity, which would be installed during the period from 2015 to 2030.[343] This additional capacity is only "slightly" less than the 375 GW of its projected additional wind and solar power capacity.[344] Thus, according to the IEA's NDC scenario for China the country's power sector would still heavily rely on coal to produce electricity in the decades to come.

5.3.3.4. Concluding remarks

Contrasting the NDCs with some estimates by the IEA summarised in the respective NDC scenarios helps to understand the nature of the NDCs and their potential contribution to the PA's objectives. The structure of the PA requires the parties to pursue an ambitious approach when drafting their NDCs. The description of both the difficulties with the liberalisation policies and the beginning of the

[338] IEA, 2015b, 51–2.
[339] Ibid., 53.
[340] Ibid., 52.
[341] Ibid., 53.
[342] Ibid.
[343] Ibid., 52.
[344] By way of comparison, in the NDC scenario that the IEA made on the EU the coal-fired capacity of the entire EU would decline *to* 120 GW by 2030. Thus, China would *add* almost three times the capacity of coal-fired power generation of what the EU will retain by 2030.

low-carbon transition in the preceding sections illustrated that it can be expected that the parties to the PA would be reluctant to promise more than existing policy plans at the international level. It leaves the question open of whether and how the UN climate regime will create incentives for the states parties to increase their NDCs significantly.

On a substantive note, the assessment of the NDCs shows that most measures to reduce emissions centre on the energy sector, especially the power sector. In their submissions, the states parties thus acknowledge the centrality of the energy system in reducing greenhouse gas emissions, including CO_2 emissions. By the mid-2010s, the developments in the energy sector and efforts in many states to implement the low-carbon transition seemed to reveal an evolving shared understanding about viable steps to mitigate climate change. The next section traces and evaluates this evolution.

5.4. Constructing the rules for global decarbonisation

After the brief overview of domestic low-carbon legislation and its submission to the UNFCCC registry in the previous section, this section investigates whether, at the time when the PA was being drafted, decarbonisation formed a shared understanding in the economic realm. This section thus seeks to explore whether decarbonisation constitutes an economic idea – i.e. an idea that gives structure to economic activity. To be able to draw some conclusions, this section contrasts the concept of decarbonisation with the ideas that shaped neoliberalism and inspired the liberalisation[345] of many economic sectors from the 1980s onwards, including the liberalisation of the power sector. These neoliberal ideas[346] can be summarised as being rooted in a thinking that perceives the capability of markets to allocate resources cost-effectively as supreme. The previous sections 5.2. and 5.3. presented an assessment of how the power sectors developed in the three jurisdictions. It provided some valuable findings that put market liberalisation policies into perspective.

These findings not only help to grasp the meaning of decarbonisation regarding the transformation of the energy system but also point to instances of interaction between domestic and international lawmaking. Based on the findings in the sections on liberalisation and decarbonisation, this section considers indicators that both presupposed and facilitated a reconstruction of the UN

[345] Generally, the economic term "liberalisation" refers to reductions in restrictions on international trade and capital flows. Thus, liberalisation is accompanied by a reduction of state interference in the targeted sectors. *See*, Encyclopaedia Britannica, "Liberalization," https://www.britannica.com/topic/liberalization.

[346] *See* for an intellectual history of neoliberal thinking, Slobodian, Quinn, *The Globalists: The End of Empire and the Birth of Neoliberalism*. Cambridge, MA: Harvard University Press, 2018.

climate regime, including a reorientation of the CBDR principle. The next subsection 5.4.1. relies on constructivist thinking to examine the conceptualisation of decarbonisation. Then, subsection 5.4.2. illustrates how the regulation of decarbonisation emerged in the national arena and, subsequently, transcended to the international level.

5.4.1. Decarbonisation as an ideational concept

This section investigates the nature of decarbonisation. For the brief analysis, which aims to collect some key points, this section relies on the example of the reforms and transformation that the power sectors has been witnessing since the 1980s. The section argues that, first, decarbonisation is an ideational concept that forms an add-on to the economic idea of liberalisation. Second, this ideational concept is rooted in the fossil economy.

Decarbonisation and ongoing market reforms brought about many changes. Therefore, a brief look at the ideational foundation of these transformations is warranted. It is important to assess the structural impact of both processes on the electricity sector, in order to understand the nature of decarbonisation and its interaction with the laws that guide this transformation at the national and international levels.

For examining the effect of decarbonisation on the legal and institutional framework that governs the power sector, constructivist theories of international political economy (IPE) research are helpful. Mark Blyth studies the critical role of economic ideas[347] in the process of institutional change that occurred in market economies from the 1970s and early 1980s onwards.[348] He studies the liberalisation of western economies during the 1990s and describes the combination of ideas and interests "as essentially embedded elements of institutional change."[349]

This relates to the core of what this brief analysis aims to discern in the case of decarbonisation: Is decarbonisation an economic idea that has instigated institutional change? The answer to this question is vital for understanding this concept's interaction with the norms of the UN climate regime that the next section will consider.

Since Blyth identifies the liberal market reforms as an economic idea, it is easy to contrast decarbonisation with this idea. The onset of liberalisation in many states in the 1990s followed a

[347] In international relations, the term "ideas" is used to describe sets of beliefs held by decision makers or that are prevalent within institutions. *See* on the study of economic ideas in the context of international affairs, Woods, Ngaire, "Economic Ideas and International Relations: Beyond Rational Neglect," *International Studies Quarterly* 39, no. 2 (1995): 162–3; and on the relationship between ideas and policymaking, Campbell, John L., "Ideas, Politics, and Public Policy," *Annual Review of Sociology* 28 (2002): 21–38.
[348] Blyth, Mark, *Great Transformations: The Rise and Decline of Embedded Liberalism*. Cambridge: Cambridge University Press, 2002.
[349] Ibid., 7.

situation of "Knightian uncertainty" – i.e. circumstances that contemporary agents experience as unique events and that make them unsure how they could define and eventually realise their interests.[350]

No doubt, instances of economic instability can result in such serious forms of uncertainty. Constructivist IPE investigates the role of ideas in alleviating or even ending the feeling of uncertainty, by helping create a stable institutional structure.[351] Ideas, given their discursive nature as shared understandings, are part of and shape processes of "common knowledge creation" that identify crises and, subsequently, guide the formation of new common knowledge[352] and new institutions.

The previous sections, especially subsection 5.2.2, conceptualised decarbonisation. In the case of the power sector, it included several measures – such as the definition of a carbon price, the support for renewables, the creation of balancing areas, which requires the construction of transmission lines and interconnection of larger regions. By implementing these measures, policymakers sought to achieve a reduction of CO_2 emissions that were caused in the course of generating fossil-fuel based electricity. These measures formed the main elements that defined the concept during the period when the PA was negotiated.

Decarbonisation, as imagined in 2015, was a long-term process in which various agents participated – governments, electricity producers, transmission and distribution systems operators, and electricity consumers. The crisis and uncertainty that these agents faced were caused by a combination of the threat of climate change and the first steps that governments took to implement climate measures, such as setting a carbon price and creating support schemes for renewables.

The overview of how these steps evolved in the EU, U.S., and China illustrated that governments tried to implement measures that were thought to bring about emissions reductions or limitations. However, these measures, announced as long-term policies and adopted as legislation, subsequently altered the normative structure of the electricity sector. Initially, renewables might have been ignored as a niche of the electricity sector. Yet, with persistent government support the share of renewables in the electricity consumption increased. Actors in the power sector were faced with uncertainty – i.e. institutional instability marked by frequently amended laws, ever more strategies to address climate change, and gradually increasing emissions reduction targets. The pre-

[350] Ibid., 9.
[351] *See* for the relationship between ideational processes and institutional change, Béland, Daniel, "Ideas and Institutional Change in Social Security: Conversion, Layering, and Policy Drift," *Social Science Quarterly* 88, no. 1 (2007): 20–38.
[352] *See* for the creation of common knowledge and its role in institutional change, Culpepper, Pepper D., "The Politics of Common Knowledge: Ideas and Institutional Change in Wage Bargaining," *International Organization* 62, no. 1 (2008): 1–33.

existing normative structure was changing but there were no new institutions that could contribute to economic stability. Rather, low-carbon measures destabilised the institutional order. Furthermore, there was no blueprint for a new structure. An economic idea would provide a way out.

Economic ideas give agents an "interpretive framework."[353] This framework explains how the economy works by laying out its constitutive elements and "proper" as well as "improper" interrelations.[354] By doing so, economic ideas convey "a 'scientific' and 'normative' account of the existing economy and polity, and a vision that specifies how these elements *should* be constructed."[355] Think of the cost-effectiveness postulate of the liberalisation idea: If one wants economic activity to be conducted cost-effectively, organising and regulating market structures would be the main components of the manual.

Since an economic idea can reduce uncertainty through its communication of how things should be arranged, a sequence of steps can ensue from this point. Common causes are specified; and new institutions are created.[356] This sequence of events is likely in periods "when existing institutional frameworks and the distributions they make possible fail and uncertainty prevails."[357] Under such circumstances, economic ideas really matter, mainly because they "tell agents what to do and what future to construct."[358]

During the 1980s, embedded liberalism[359] was deconstructed. Some agents presented market liberalisation a new economic idea. This development initially unfolded in the U.S. and United Kingdom.[360] People increasingly believed that this idea provided a blueprint that could form a foundation on which alternative institutions can be built, in order to regain and maintain economic stability in the longer run.[361] During the 1990s, the establishment of institutions in the economic realm were inspired by liberalisation and brought economic stability, at least in some constituencies.

Could decarbonisation convey a message of economic stability in 2015? The clear answer is: No, it could not. Why could decarbonisation then be presented as a solution to the climate crisis? The answer to this question brings back the fossil economy and the economic idea of market liberalisation. Decarbonisation was implemented as a means to help reduce CO_2 emissions. This was

[353] Blyth, 2001, 11.
[354] Ibid.
[355] Ibid. (*italics* in the original)
[356] Ibid.
[357] Ibid.
[358] Ibid.
[359] *See* for an account of embedded liberalism, Ruggie, 1982, 379–415.
[360] *See* for a constructivist analysis of the ideas that shaped (and endangered) the neoliberal order, including a model for shifts in ideational power that drive big transformations, Widmaier, Wesley, "The Power of Economic Ideas – through, over and in – Political Time: The Construction, Conversion and Crisis of the Neoliberal Order in the US and UK," *Journal of European Public Policy* 23, no. 3 (2016): 338–56.
[361] Blyth, 2001, 260; Blyth refers to Keynes' understanding of conventions, Keynes, John Maynard, *The General Theory of Employment, Interest and Money*. London: Harcourt Brace and World, 1964, 147–65.

possible, because decarbonisation was merely an add-on to the economic idea of liberalisation. It borrowed the stability that liberalisation still carried (or, for some, had never lost). Indeed, during the mid-2010s, the ultimate goal of decarbonisation – net-zero carbon emissions (carbon neutrality) – was not commonly discussed. This stage in the process seemed to be ages away. The term low-carbon *transition* even implied a much longer intervening period – and an open ending. Something new might emerge by then. For the time being, fossil fuels would continue to provide institutional stability. Hence, decarbonisation could thrive as an add-on. Its conceptualisation as a process neither challenged the fossil economy nor could it replace its institutions.

Low-carbon measures were designed to be compatible with the electricity markets that constituted hybrid forms of liberalised markets and were based on the large-scale use of fossil fuels. Indeed, in some jurisdictions the introduction of renewables into the market was accompanied by a "feed-in tariff," in order to enable producers of renewable electricity to sell their electricity in a fossil-fuel based market environment. Other support mechanisms were also designed to convince producers and investors that renewable electricity could "survive" in the competition-driven environment of the power sector that market liberalisation had created. The rules of the low-carbon transition did not change the institutional environment of the fossil economy but emerged within it. Hence, decarbonisation was constructed as an ideational concept dependent upon liberalisation and the fossil economy. As of 2015, it did not offer a blueprint for the creation of institutions that can communicate economic stability in a climate-constrained, non-fossil world. The ideational work clearly needed to continue. The next subsection discusses the interaction between domestic and international levels.

5.4.2. Domestic policies become NDCs under the UN climate regime

This subsection seeks to examine how the ideational concept of decarbonisation arrived at the international level and was included in various documents of the UN climate regime. This subsection proceeds in two steps. In order to explain how domestic policies became NDCs under the UN climate regime, it first studies how the concept of decarbonisation emerged in the domestic context. Then, it considers the elevation of the concept to the international level. The next chapter will discuss the concept's entry into the UN climate regime. The notion of decarbonisation is included in Article 2 (1) (c) PA which proscribes that financial flows should be consistent with "a pathway towards low greenhouse gas emissions and climate-resilient development." Thus, during the period from 2005 to

2015 the domestic and international legal spheres incrementally embraced the concept of decarbonisation.

After having explored the nature of decarbonisation in the previous subsection, this analysis seeks to discover indicators at the domestic level that influenced the reconstruction of the UN climate regime, including the reorientation of the CBDR principle. The following chapters six and seven discuss the changes and innovations that the PA introduces to international climate cooperation and the evolution of the CBDR principle. As a prelude to these assessments, this subsection aims to relate the PA to domestic legal developments.

This subsection proposes that the submission of NDCs to the UNFCCC secretariat by the parties can be seen as an outcome of multidirectional processes of policy diffusion.[362] Indeed, decarbonisation policies frequently interacted with each other, which would concern horizontal diffusion processes. To understand vertical interactions, the second part of this subsection relies on the concept of "socialisation"[363] in the context of international regimes. This examination shows whether and how the UN climate regime influenced the decision-making regarding low-carbon measures. Finally, throughout both processes indicators emerged that continued to shape the reconstruction of the UN climate regime.

The concept of policy diffusion[364] helps to examine how public policies spread across states.[365] Policy diffusion occurs when a government's policy decisions in a one state are systematically conditioned by prior policy choices in other states.[366] Considering the liberalisation and decarbonisation of the power sector as interactive processes is useful for two reasons. First, it helps to clarify the drivers of policy diffusion in both contexts. Second, it shows where the centre of gravity is located that steers these transformations and enacts crucial legislation.

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[362] *See* for a discussion of the mechanisms of policy diffusion, Gilardi, Fabrizio, "Transnational Diffusion: Norms, Ideas, and Policies," in *Handbook of International Relations*, ed. Walter Carlsnaes, Thomas Risse, and Beth Simmons (London: SAGE, 2012), 453–77; Gilardi, Fabrizio, "Who Learns from What in Policy Diffusion Processes?," *American Journal of Political Science* 54, no. 3 (2010): 650–66; and specifically on competition Baybeck, Brady, William D. Berry, and David A. Siegel, "A Strategic Theory of Policy Diffusion via Intergovernmental Competition," *The Journal of Politics* 73, no. 1 (2011): 232–47; and Dobbin, Frank, Beth Simmons, and Geoffrey Garrett, "The Global Diffusion of Public Policies: Social Construction, Coercion, Competition, or Learning," Annual Review of Sociology 33 (2007): 457–60.

[363] *See* for an analysis of socialisation in international relation research, Schimmelfennig, Frank, "Internationale Sozialisation neuer Staaten: Heuristische Überlegungen zu einem Forschungsdesiderat" [International socialisation of new states: Heuristic thoughts about the necessity of a new field of research], *Zeitschrift für International Beziehungen* 1, no. 2 (1994): 335–55; Schimmelfennig, Frank, "International Socialisation in the New Europe: Rational Action in an Institutional Environment," *European Journal of International Relations* 6, no. 1 (2000): 109–39; Flockhart, Trine, "'Complex Socialisation': A Framework for the Study of State Socialisation," *European Journal of International Relations* 12, no. 1 (2006): 89–118; Schimmelfennig, Frank, "Internationale Sozialisation: Von einem ‚erschöpften' zu einem produktiven Forschungsprogramm?" [International socialisation: From an 'exhausted' to a productive field of research], in *Die neuen internationalen Beziehungen: Forschungsstand und Perspektiven in Deutschland* Sozialisation [New international relations: State of affairs and perspectives of this field of research in Germany], ed. Gunther Hellmann, Klaus Dieter Wolf, and Michael Zürn (Baden-Baden: Nomos, 2003), 401–27.

[364] *See* for an overview of research on policy diffusion, Gilardi, Fabrizio, "Transnational Diffusion: Norms, Ideas, and Policies," in *Handbook of International Relations*, ed. Walter Carlsnaes, Thomas Risse, and Beth Simmons (London: SAGE, 2012), 453–77.

[365] *See* for other drivers of policy diffusion, Dobbin, Frank, Beth Simmons, and Geoffrey Garrett, "The Global Diffusion of Public Policies: Social Construction, Coercion, Competition, or Learning?," *Annual Review of Sociology* 33 (2007): 449–72.

[366] Simmons et al, "Introduction: The International Diffusion of Liberalism," *International Organization* 60, no. 4 (2006): 787.

More often than not, public policy choices are based on considerations related to the competitiveness of the domestic economy. Policy choices that one state makes, such as upgrading physical or institutional infrastructure in specific sectors in order to improve the investment climate, become relevant for states that compete for the same resources. Fabrizio Gilardi identifies international competition as one of the main drivers for policy diffusion. He defines competition as the process whereby policymakers anticipate or react to the behaviour of other states in order to attract or retain economic resources.[367] The question is whether states embarked on the low-carbon energy transition, in order to maintain or even enhance their economies' competitiveness.

The regulation of the electricity sector is an important element of energy security. Think of the essential role that reliable electricity supply plays for almost any activity in modern society. Cost-effective power supply is crucial for all major economies. Thus, it is important for policymakers to study how a state that is considered a competitor regulates its power sector in order to attract investment and improve the sector's functioning.[368]

During the 1990s, as discussed in subsection 5.2.1., the argument of greater cost-effectiveness convinced destitute public authorities in many states to introduce market mechanisms and allow competition in formerly monopolised power sectors. Thus, international competition can explain the liberalisation of the power sector as a case of transnational policy diffusion.

The previous subsection characterised the low-carbon transition of the power sector as an add-on to the liberalisation of the sector. Therefore, the question arises whether the low-carbon transition or elements of it were also inspired by competition considerations. The deployment of renewable energy sources depended on new technologies. In fact, innovative technologies generally attract the attention of competitors. This element of the low-carbon transition might fit into the pattern of policy diffusion.

Indeed, from a government perspective competition arguments focused on two considerations in the context of renewable energy sources – i.e. concerns about the security of energy supply and the need to support new promising industries. Abandoning fossil fuels in favour of renewable sources of energy to enhance energy security was first proposed to a broader public in 1976. Back then, Amory B. Lovins pointed to potential gains for U.S. foreign policymaking that a switch of fuels could

[367] Gilardi defines competition as the process whereby policymakers anticipate or react to the behaviour of other states in order to attract or retain economic resources. *See*, Gilardi, 2012, 460.

[368] The importance of acquiring and updating this knowledge is emphasised by numerous reports that the International Energy Agency regularly publishes. Indeed, the annual World Energy Outlook also includes a section on the most recent developments in the electricity sector, including regulatory matters.

bring about.[369] The National Energy Policy Act emerged from the debate that Lovins's article had instigated. However, abundant oil supplies in the 1990s and the shale gas revolution that began in the U.S. around the year 2005 had repeatedly impeded a stronger federal push towards deploying renewables.

However, states whose economies that were not endowed with domestic fossil fuel resources had greater incentives to develop renewables. Germany is a case in point. Legislation to sell electricity from renewable energy sources to the grid was first passed in 1990.[370] Denmark, for instance, spearheaded the development of wind power technologies. Companies that produced wind turbines and had decade-long experience in this business eventually became market leaders.[371] Wind turbines were deployed onshore and offshore in and around Denmark. The companies also exported the equipment to an growing number of states. In 2015, the wind sector accounted for 42% of Denmark's electricity consumption.[372] Thus, highly developed economies saw competitive advantages with regard to the technology-intensive renewables sector when conditions for the deployment of wind and solar power improved during the first decade of the 21st century.

No doubt, during this period the global energy sector was a fertile soil for a shift away from fossil fuels and the implementation of climate change mitigation measures. Three developments created favourable conditions for the low-carbon transition. First, crude oil prices were relatively high. From 2000 to 2008, international crude oil prices increased rapidly and reached an all-time high with U.S.$147 a barrel by mid-July 2008.[373] During the period of high oil prices, investments in the development of other fuels, new technologies, and energy efficiency throughout the entire energy sector became viable.

Second, the quality of wind and solar installations increased, while costs fell significantly. The technology that enables the use of renewable energy sources became ever more advanced, following growing demand for these technologies and investment in research and development. By the mid-2010s, deploying solar panels in northern Germany, for instance, was no longer a flight of fancy. By then, solar cells were much more efficient than in the past.[374] In addition, production of parts of wind

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[369] Lovins, Amory B., "Energy Strategy: The Road Not Taken?," *Foreign Affairs* 55, no 1 (1976): 65–96.
[370] Stromeinspeisungsgesetz (StromEinspG) vom 7. Dezember 1990 (BGBl. I S. 2633).
[371] *See*, Vestas, https://www.vestas.com.
[372] "New Record-breaking Year for Danish Wind Power," *energinet.dk*, 15 January 2016, http://energinet.dk/EN/El/Nyheder/Sider/Dansk-vindstroem-slaar-igen-rekord-42-procent.aspx.
[373] The oil price hike was followed by a fast decrease following the global financial crisis and an economic decline in the U.S. and EU as well as slower economic growth in many other parts of the world, while China could only hold up its economic growth rates by implementing a massive economic stimulus plan. *See* on the development of oil prices, Kebede, Rebekah, "Oil Hits Record above $147," *Reuters*, 11 July 2008; Ausick, Paul, "Oil Drops 50% from All-time High," *USA Today*, 4 November 2014.
[374] *See* for an account of how the energy business changed during the first decade of the 21st century, Leggett, Jeremy, *The Energy of Nations: Risk Blindness and the Road to Renaissance*. London: Routledge, 2014.

turbines and solar panels in China, aided by government subsidies, considerably decreased the cost of utilising renewable energy sources in the electricity sector across the globe. The price factor was also important for the use of renewables in developing states where the decision to switch to renewables was mainly driven by health concerns related to air pollution in large cities.

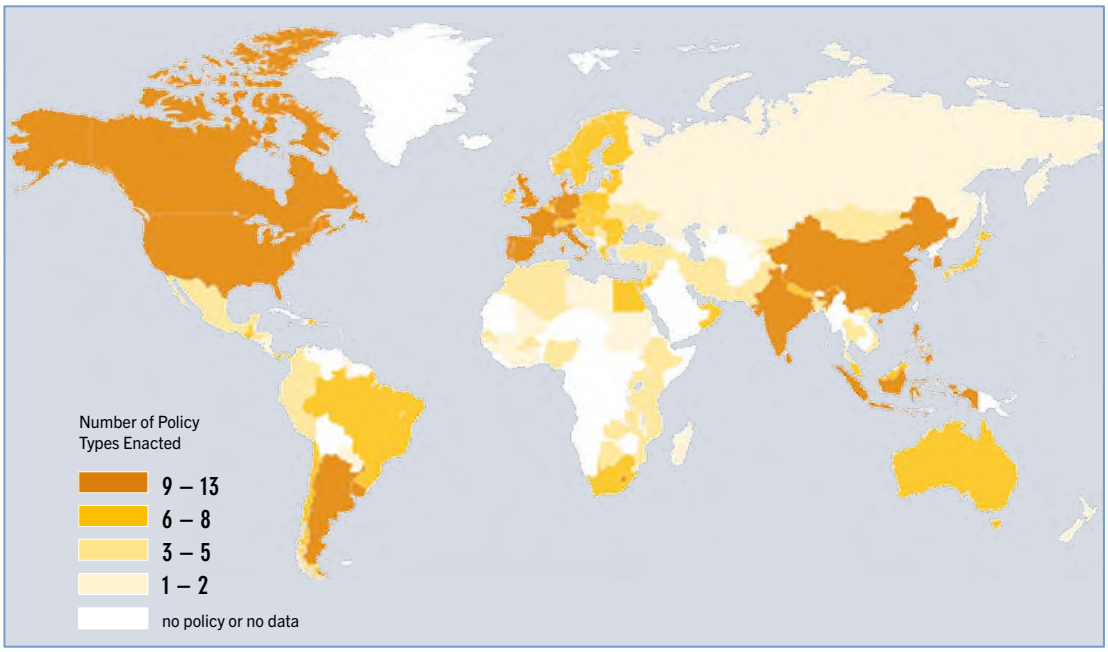
Third, significant technology-related developments in the energy business inspired policymakers and politicians. Germany pursued low-carbon policies, while simultaneously phasing out nuclear power. After the catastrophe at the Fukushima Daiichi Nuclear Power Plant in Japan in 2011, [375] the German federal government reinstituted a planned, but halted phaseout of the country's nuclear power plants.[376] This move positively affected the investment climate in the renewables sector. Subsequently, the 2000 Renewable Energy Sources Act[377] was amended several times to cope with new market developments.[378]

The example of Germany as a major export-dependent industrial economy that was willing to substantially rely on renewables for its electricity supply persuaded policymakers in other states, mainly because it emphasised the feasibility of power generation from renewable energy sources. The number of states where renewables laws had been passed and long-term strategies were being implemented grew steadily (*see* figure 5.3).

By the mid-2010s, 71 states and 28 sub-national entities had adopted renewables laws that included feed-in tariffs as their main mechanism to support renewables. Furthermore, by 2012 developing states formed the majority among the states that had implemented a feed-in tariff in the power sector. Feed-in tariffs were the most widely adopted support policy for renewables in the power sector by that time.[379] Based on long-term contracts, this mechanism refunds producers of renewable electricity for the production costs of the electricity that they deliver to the grid. For sector-wide application, this policy measure was initially introduced by the German Renewable Energy Sources Act of 2000.[380]

[375] *See*, International Atomic Energy Agency, "Fukushima Nuclear Accident," https://www.iaea.org/newscenter/focus/fukushima.
[376] When Chancellor Angela Merkel announced the phaseout, she also pointed to opportunities this step provided for German businesses that were active in the renewables sector. *See*, "Merkel: Atomausstieg eine riesige Chance für Deutschland" [Merkel: nuclear power phaseout is a golden opportunity for Germany], *Frankfurter Allgemeine Zeitung*, 30 May 2011.
[377] Gesetz über den Vorrang Erneuerbaren Energien (EEG) [Law on the priority grid access of renewable energy sources] vom 31. März 2000 (BGBl. I S. 305).
[378] *See* for an overview of the amendments, Bundesministerium für Wirtschaft und Energie, "EEG-Reform," http://www.bmwi.de/Navigation/DE/Themen/eeg-reform.html.
[379] REN21, "Renewables 2013: Global Status Report," 2013, https://www.ren21.net/reports/global-status-report/, p. 68.
[380] §§ 4–8 EEG (2000).

Figure 5.3: States with renewable energy policies, 2013



***Source*: REN21, 2013 (online), p. 79.**

To sum up, the shift towards renewables laws and policies in the electricity sector is a form of policy diffusion. The adoption of the laws was based on the interests of the states in question. The decisions were often made based on competition, energy security or air pollution considerations, instead of a clear link to climate change mitigation. Accordingly, domestic circumstances determined the policies and shaped specific national trajectories, both with respect to the scope and speed of implementing renewables policies. The ability to maintain or even enhance an economy's competitiveness, including the expectation of participating in a new phase of the energy business, convinced policymakers to consider renewables legislation. Hence, this was not primarily a diffusion of decarbonisation policies.

Accordingly, an evaluation of the reasons for adopting a broader range of climate policies needs to include the international institutional environment. After having discussed how domestic legislation in some states inspired lawmaking in other jurisdictions, the interaction between the domestic and international levels needs to be considered. Scholars of international relations (IR) apply the concept of socialisation to explain processes that occur as part of the interaction between actors and their social environment.[381] This concept is useful, because it relies on constructivist thinking to interpret transformation processes and institutional change in international affairs.[382] It is important to note that socialisation is a process and not an outcome.[383] Thus, the developments that are described generally continue to evolve.

In international affairs, and for the purpose of this brief analysis, the actor is a state, while the international community and its norms form its social and institutional environment. The precondition for socialisation processes is the existence of established and stable modes of thinking and conduct on which the prevailing order is based. To become an accepted "member" in this environment, a state has to internalise this order and act accordingly.[384]

The norms of these institutional environments constitute stable structures that form constraints on actors' behaviour; and at the same time they help shape these actors' identities and interests as related to their conduct within these structures.[385] Socialisation usually occurs in situations of stable structural conditions, under which states regard the benefits of participating in an international regime as higher than the costs that compliance with the regime involves.[386] For the process of socialisation, several elements are required – i.e. an authority providing an institutional environment, a goal and substantive content prescribed by rules, and a reason for socialisation.[387]

In the context of the UN climate regime, the UNFCCC and in particular the KP would be considered as the authority and institutional environment. Established modes of thinking and conduct were not really concrete. Yet, both treaties communicated the need to adopt climate policies. Under the KP, developed states were obliged to reduce or limit their greenhouse gas emissions. Obviously, a treaty regime – as a "social environment" that the states parties have created – generally seeks to solve a problem that the participating states acknowledge as such. Therefore, a state's intention to interact with the regime is clearly based on the expectation that an international

[381] Schimmelfennig, 1994, 349.
[382] Schimmelfennig, 2003, 405.
[383] Schimmelfennig, 2000, 112.
[384] Schimmelfennig, 1994, 349.
[385] Flockhart, 2006, 90.
[386] Schimmelfennig, 2000, 110.
[387] Schimmelfennig, 1994, 341–2.

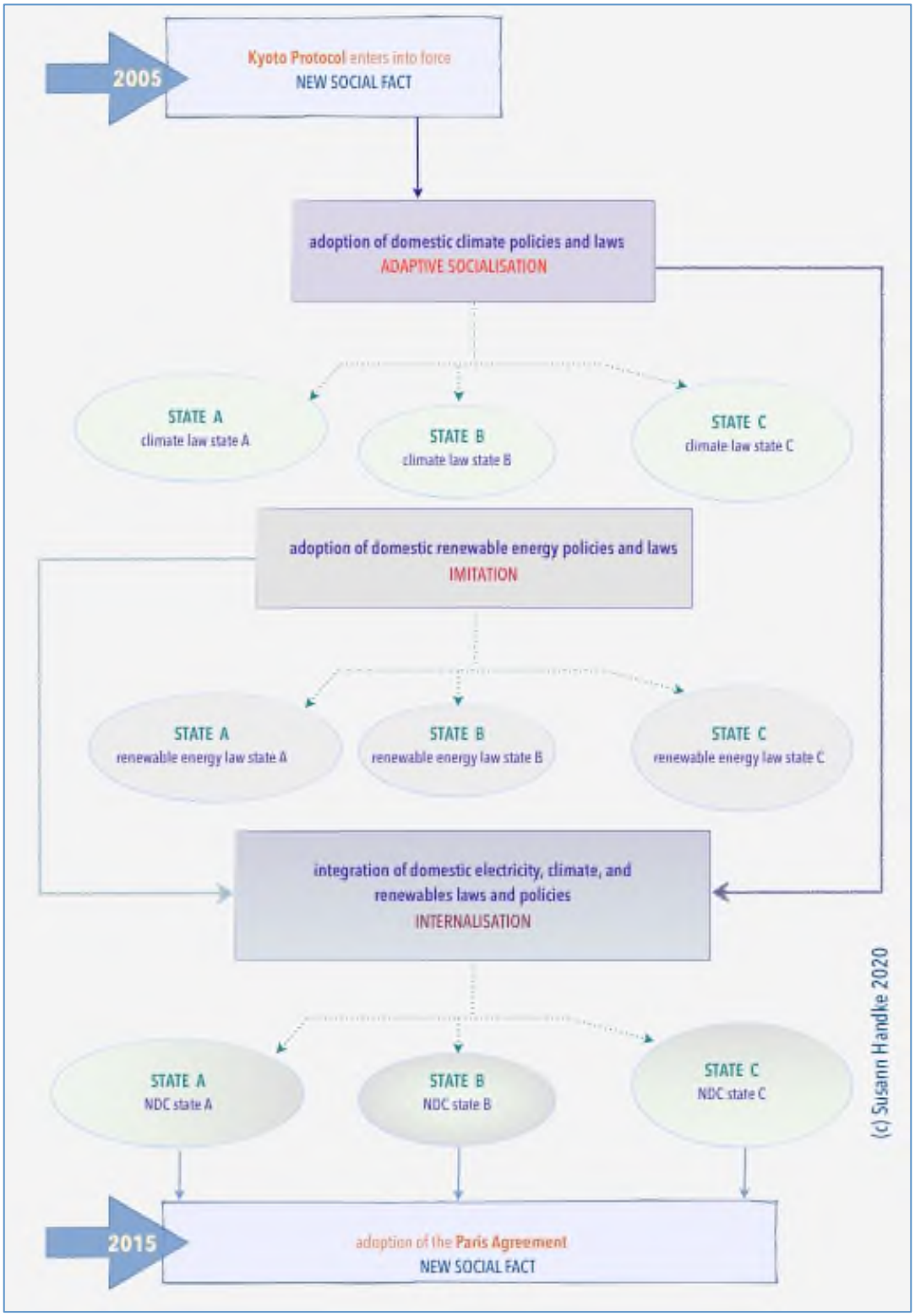
approach can provide knowledge and guidance, which eventually will help the parties to the regime solve the problem in question.[388] The goal of socialisation was to contribute to the mitigation of climate change. The following explanation considers how the process of socialisation can be imagined after the KP's entry into force and which role domestic laws and policies played in this process.

The socialisation process evolves in stages, starting with adaptive steps and then proceeding with imitation and internalisation.[389] Figure 5.4 illustrates this process related to the interaction between national and international levels of rulemaking. It is important to note that socialisation processes in an international regime necessarily depend on the domestic institutional and normative situation. Thus, the outcomes of socialisation differ from state to state. The model seeks to highlight this characteristic of the process through the shading of the states in the post-internalisation phase.

For most states, the process of socialisation in the UN climate regime commenced with the KP's entry into force. This event established a new social fact in the environment that was created by the UNFCCC. The states interacted with this institutional environment. Subsequently, developed states enacted climate laws and long-term policies in order to fulfil their commitments under the regime. This was the phase of *adaptive* socialisation. During this phase states are generally unsure how to proceed, but they realise that some measures have to be taken to abandon outdated policies and adjust to the regime's objectives. They acknowledge the new social fact.[390] The next phase is generally characterised by some form of self-adjustment or self-configuration towards the international regime. The states "learn" and "imitate" the rules that the regime prescribes.[391]

[388] Ibid., 348.
[389] Ibid., 349; Schimmelfennig, 2000, 112.
[390] Schimmelfennig, 1994, 349.
[391] Ibid.

Figure 5.4: Interaction between the UN climate regime and domestic policies and legislation, 2005–2015



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In the case of the UN climate regime, however, horizontal interaction between the states parties also played a significant role. Although the KP was silent on concrete measures to achieve emissions reductions, albeit beyond emissions trading, the states parties gradually identified the massive deployment of renewables in the electricity sector as a means to proceed. Thus, as described above, the *imitation* phase in the specific case of the UN climate regime relied on a strong horizontal line of communication.

The final phase is the *internalisation* phase. When the states arrive at this stage, they consider the rules that the regime stipulates as their own. The international norms dovetail with the domestic body of rules regarding the matter in question.[392] In the UN climate regime, this process entailed an integration of climate and energy legislation and policies. The overview of the developments in the EU, U.S., and China showed that this integration effort evolved differently in each jurisdiction. It depended on the state of liberalisation of the electricity sector and its regulatory environment. Furthermore, constitutional and political determinants influenced the ability of the central policymaking entities – the European Commission, the U.S. federal government, and the State Council – to implement energy and climate measures. Thus, in each jurisdiction a distinct constellation of climate and energy legislation emerged. Each jurisdiction interpreted what decarbonisation meant and thus defined its decarbonisation pathway. Based on these projections, the states prepared and submitted their NDCs to the UNFCCC secretariat.

Domestic renewables legislation in developing states with fast growing economies, in particular in China, hinted at the possibility to engage the leaders of these states in a conversation about a greater contribution of developing states to international climate action. Thus, the evaluation of national legislative and policy developments suggested possible avenues to reconsider the scope of the participation in global efforts to mitigate climate change.

However, decarbonisation is not a regulatory objective in its own right. This ideational concept evolved as an add-on to the liberalisation policies in the electricity sector. The previous subsection concluded that domestic legislative and policy processes, which shaped the low-carbon transition in many states, were not based on an economic idea that carried a notion of stability. Still, through policy diffusion *elements* of decarbonisation, which were discussed in sections 5.2. and 5.3., were integrated into domestic energy legislation, in accordance with the specific domestic circumstances. As of 2015, a state's domestic situation in this regard was usually characterised by the extent to which liberalisation policies were implemented. Furthermore, it was of great import whether

[392] Ibid.; Schimmelfennig, 2000, 112.

constitutional, regulatory, and political characteristics of the state allowed a centralised approach to the implementation of electricity legislation. Thus, the ideational concept of decarbonisation was too imprecise to be negotiated and agreed on at the international level. The low-carbon transition remained a national affair.

Accordingly, reliance on nationally determined actions was the only viable way to regulate international climate cooperation under the UN climate regime. The twofold processes of policy diffusion with respect to renewable energy deployment and the socialisation of the states parties in the UN climate regime brought about a starting point for the substantive reconstruction of the regime. Rather than encouraging international lawmaking efforts, these processes essentially communicated limitations on the desire to regulate the mitigation of climate change at the international level.

In this sense, domestic legislation provides indicators that point to a reconstruction of the UN climate regime. These indicators derive from the assessment of the ideational concept of decarbonisation and its evolution in the above-described socialisation processes in each individual state. First, decarbonisation is an add-on to liberalisation policies that were introduced in fossil-fuel based energy sectors. Its evolution depends on the stability that national rules and institutions provide. Second, the enactment of low-carbon measures in developing states suggests that a broader participation in the PA was signalled ahead of its adoption, which would allow a reconsideration of the differentiation issue and the operationalisation of the CBDR principle. Third, the substantive content of low-carbon measures can only be determined at the national level. Decarbonisation is a governed transition in which most decisions need to be adjusted to national regulatory, social, and economic circumstances. Therefore, parties cannot agree to let the international level prescribe certain elements that are generally part of the decarbonisation path with percentages, timelines, and implementation schedules. Policymakers at the national level need room for manoeuvre to adjust the transition process to new developments. Hence, the study of contemporary domestic low-carbon measures leads to some clues about the benchmark for a treaty that seeks to regulate international climate cooperation post-2015.

5.5. Concluding remarks

The survey of low-carbon measures, including the specific situation in the EU, U.S., and China intended to analyse how domestic rulemaking contributed to the conceptualisation of climate change mitigation until the adoption of the PA. The analyse of decarbonisation policies revealed

three crucial characteristics of this transformation. First, a central authority needs to guide the low-carbon transition. Second, the quality of the institutions that regulate and guide the transition is vital for a timely implementation of the various low-carbon measures and their meaningful adjustment to the frequent changes that occur in this process. Third, decarbonisation necessitates a centralised decision making to coordinate the interaction of low-carbon policies.

This chapter primarily followed the decarbonisation storyline. It explored the emergence of this concept from a general perspective, by identifying the main elements of this transition, and then continued to specifically examine the policies and laws that the EU, U.S., and China had enacted until 2015. This analysis formed the basis to further study the nature of the concept. It concluded that decarbonisation was an add-on to the liberalisation policies in the electricity sector. On its own, it cannot convey a blueprint for economic stability. This suggests that, for the time being, the electricity sector – and the energy sector in general – will further have to rely on the provision of fossil fuels and the functioning of the institutions that the fossil economy has brought about. Thus, decarbonisation as an ideational concept is dependent upon liberalisation and the fossil economy. This conceptualisation informed the negotiation of the PA.

The dimension of time played a vital role in the emergence of low-carbon policies. Indeed, domestic measures evolved in a short period of time. Most states only adopted low-carbon measures after about 2005. This relates to the entry into force of the KP as well as to more suitable economic circumstances, such as high oil prices and more affordable and efficient technologies for the utilisation of renewable energy sources. Thus, the conceptualisation of how climate change could be mitigated developed within only ten years.

In this chapter's account, decarbonisation and differentiation come together when the dimension of imagination is considered. No doubt, the construction of decarbonisation was a global effort. By the 2010s, developing states were the majority of states that adopted and implemented new low-carbon legislation. Although the implementation was difficult and required frequent adjustments, many states – developed and developing – introduced at least some policies and regulation that sought to foster the low-carbon transition of power generation.

China's choices in this regard were particularly important. Its potential contribution under a new international legal instrument that would replace the KP would to a large degree determine the chances of the UN climate regime to succeed in regulating meaningful international climate cooperation. Thus, the actions and legal measures that the Chinese leadership took domestically were crucial to involve it in a global conversation about its contributions to global climate change

mitigation. Indeed, as soon as China and, arguably, other developing states implemented elements of the decarbonisation, the argument that developing states were to be exempted from commitments under a restructured UN climate regime became void. This evolution of the domestic legislative playing field created room for a reassessment of the CBDR principle's operationalisation in the UN climate regime.

The diversity of national approaches to the low-carbon transition pertains to the dimension of complexity. The transition has been evolving in stages following consecutive policies that pursued different goals. First, the liberalisation of the electricity sector caused structural difficulties and regulatory challenges in the sector. Second, in many states the introduction of renewables laws communicated a message of economic opportunity and energy security. In the third stage, however, the large-scale deployment of renewables required massive infrastructure and institutional adjustments in the electricity sector, while societal and environmental side effects spoiled the "green" endeavour to some degree. Going low-carb comes with a chill, it is neither gentle nor predictable.

OUTLINE – CHAPTER SIX

Constructing global decarbonisation: Reversal and limits of international climate cooperation

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CHAPTER SIX

Constructing global decarbonisation:

Reversal and limits of international climate cooperation

6.1. Introductory remarks

Negotiators drafted the UNFCCC and KP, the two treaties of the UN climate regime between 1990 and 1997. Chapter three explained that the states parties did not foresee that decarbonising economic activity globally, starting with the energy system, would be central to meaningful climate change mitigation. Both treaties approach this task from the perspective of reducing "pollution" levels of several greenhouse gases in the atmosphere. Furthermore, Bodansky et al observe that the UNFCCC and KP were designed to achieve climate change mitigation related to all gases, in an economy-wide effort.[1]

The institutionalisation of this choice had a profound impact on the regime: In order to prevent climate change, emissions of all greenhouse gases had to be cut across all sectors of industrialised economies. This conceptualisation diverted attention away from the reduction of CO_2 emissions as the single most important aspect of climate change mitigation.[2] Although the combustion of fossil fuels to generate energy contributed a large share of greenhouse gas emissions, this source of CO_2 emissions was treated like any other process through which anthropogenic greenhouse gases were emitted.

No doubt, the KP's entry into force in 2005 was a milestone in the history of addressing climate change. Many governments enhanced their efforts to implement climate policies after 2005.

[1] The states could thus choose measures to reduce whichever gases at the lowest costs. *See*, Bodansky et al, 2017, 12–3.
[2] *See* chapter one, subsection 1.1.1., figure 1.2.

Interestingly, domestic policies and legislation primarily focused on the energy sector; and energy companies across the globe started envisioning a low-carbon energy future. Low-carbon policies were developed for the electricity sector and, subsequently and at a much slower pace, for transport and heating. Somehow the UN climate regime needed to respond to trends in domestic lawmaking on climate change mitigation.

This chapter examines how decarbonising energy generation – the main task of reducing CO_2 emissions, at least during the initial phase of this process – gained more prominence in the UN climate regime. This is not to say that CO_2 was singled out in the provisions of the PA. Rather, previous COP decisions and the way in which the PA approaches international climate cooperation suggests a focus on decarbonisation. Thus, the topic of this chapter is the adjustment of the UN climate regime's approach to mitigation.

This chapter examines the reversal of the Kyoto architecture during the period from 2005 to 2015 – from the KP's entry into force until the adoption of the PA. Subsequently it evaluates the PA's approach to climate change mitigation. However, the chapter does not provide a comprehensive analysis of the PA, which other authors have already accomplished.[3] Chapter seven will conduct a legal analyse of the CBDR principle and mitigation provisions in the PA and the decisions of the Katowice Rulebook.

The analysis in this chapter is based on the findings of chapter five that conceptualised decarbonisation as an add-on to the liberalisation of the electricity sector, which only constitutes a modest first step in the low-carbon transition of the entire economy. Furthermore, the conceptualisation of decarbonisation and in particular the examples of the EU, U.S., and China revealed that the policy challenges in this process varied considerably among the parties to the UN climate regime. Indeed, this characteristic of the low-carbon transition suggests the choice for a bottom-up approach to international climate cooperation. This chapter collects arguments to answer the first part of the research question of this dissertation:[4]

> ***How did experiences from domestic climate and energy legislation contribute to a substantive bottom-up reconstruction of the UN climate regime****; and how does this reconstruction relate to the CBDR principle?*

[3] *See*, Mayer, Benoit *The International Law on Climate Change*. Cambridge: Cambridge University Press, 2018, especially chapter four; Bodansky et al, *International Climate Change Law*, Oxford: Oxford University Press, 2017, especially chapter seven; and specifically, Klein et al, eds. *The Paris Agreement on Climate Change: Analysis and Commentary*. Oxford: Oxford University Press, 2017.

[4] The second part of this question will be answered in chapter seven.

The main findings with respect to the ideational concept of decarbonising the electricity sector include legislative measures that indicate the commencement of the low-carbon power transition mainly concern the regulation of carbon pricing, support for the deployment of renewables, and the interconnection of regional grids to create larger balancing areas for intermittent renewable electricity. From 2005 to 2015, these developments at national and sub-national levels gradually correlated with the further evolution of the UN climate regime. By studying relevant COP decisions of the UN climate regime that were adopted during this period, this chapter considers the international legal outcome of the interaction between parallel rulemaking efforts at domestic and international levels.

The chapter argues that from a regulatory point of view the adoption of the PA was crucial, as it reversed the KP's top-down approach to climate governance. By requiring the parties to regularly submit NDCs as global response to climate change,[5] the PA embraces a long-term interactional process[6] between national and global levels of climate governance. A consideration of the second sub-question that guided this research project allows this chapter to offer some reflections on the limits and prospects of international climate cooperation under the PA:

> 2. *Which **top-down elements** are necessary to facilitate a **meaningful reconstruction** of the UN climate regime, based on national regulatory approaches?*

The brief analysis of the UN climate regime's establishment in chapter three showed that during the 1990s the parties struggled to fathom the nature of climate action. At that time, there was no shared understanding yet that the mitigation of climate change would necessitate the decarbonisation of economic activity. Chapter five concluded that national legislation was vital for the re-consideration of the substantive direction of international climate cooperation.

The structure of the chapter is as follows. To assess the evolution of the UN climate regime, the next section contrasts the flexibility mechanisms[7] of the KP with the emergence of the ideational concept of decarbonisation. It explores how the (initial) perception of climate change mitigation was transposed into the design of these flexibility mechanisms, in particular the clean development

[5] Articles 3 and 4 PA.
[6] This feature will be discussed in detail in chapter seven.
[7] Articles 6, 12, and 17 of the KP define the mechanisms of joint implementation, clean development, and emission trading, respectively. *See* for a brief description of their objectives, characteristics, and deployment 6.2.1.

mechanism (CDM). It specifically discusses the mechanisms' performance during the period from 2005 to 2015. Section three investigates how the KP's pronounced top-down approach and its rigid differentiation between developing and developed states was gradually revised. Section four evaluates the PA's bottom-up approach to climate change mitigation. Section five reflects on the limits and prospects of international climate cooperation under the PA. Section six concludes.

6.2. Clinging to the air-pollution approach

The KP is silent about the path to emissions reduction. Chapter three explained that the parties were uncertain which actions were required and also feared the impact of bold measures on domestic economic growth. Given the environmental law approach of the UN climate regime, the KP treats greenhouse gases like pollutants and determines reduction targets for state parties included in Annex I of the UNFCCC. Refitting industrial installations to reduce these emissions seemed plausible; and project-based solutions appeared to be easy to realise. In an attempt to support developing states in such efforts, the KP offered market mechanisms that ensured financing for such projects from Annex I parties in exchange for emission credits. Initially, these flexibility or market mechanisms were praised as important institutional innovations.[8] Since the introduction of these mechanisms constituted a vehicle to start a global conversation on emissions reduction, their contribution to the UN climate regime's evolution warrants scrutiny. To be clear, this section does not evaluate the effectiveness of the KP.[9]

This section briefly describes the objectives of the flexibility mechanisms and gives an overview of their performance. This assessment includes a discussion of the flexibility mechanisms' effectiveness related to the overall objective of the UN climate regime as stated in Article 2 UNFCCC – i.e. stabilising the concentrations of greenhouse gases in the atmosphere to prevent dangerous climate change. Subsection 6.2.1 first gives an overview of the mechanisms. Then, subsection 6.2.2. explores the performance of the mechanisms in terms of all their stated aims. Finally, subsection 6.2.3. summarises the development of global greenhouse gas emissions at the end of the first commitment period of the KP (2008–12).

[8] Werksman, Jacob, "The Development Mechanism: Unwrapping the 'Kyoto Surprise'," *Review of European, Comparative and International Environmental Law* 7, no. 2 (1998): 147.

[9] Recent academic publications concluded that an average CO_2 emissions reduction effect of 7 to 10% was achieved with respect to the Annex I states (but not with respect to global emissions). *See* for an overview, Almer, Christian, and Ralph Winkler, "Analyzing the Effectiveness of the International Policies: The Case of the Kyoto Protocol," *Journal of Environmental Economic and Management* 82 (2017): 125–51.

6.2.1. Acronyms of cost-effectiveness: JI, IET, and CDM

The KP entered into force on 16 February 2005.[10] Pursuant to Article 3 (1) KP, parties listed in Annex I of the UNFCCC (Annex I parties), which had ratified the Protocol, had to reduce their overall greenhouse gas emissions by at least 5% below 1990 levels during the first commitment period (2008–12).[11] They could try to achieve these emissions reductions individually or jointly.[12]

The KP included several innovations that should facilitate developed states' efforts to comply with their emission reduction obligations. First, three market mechanisms – Clean Development Mechanisms (CDM), Joint Implementation (JI), and International Emissions Trading (IET)[13] – were designed to help industrialised states to cost-effectively fulfil their emissions reduction obligations. Second, certified emissions reductions (CERs),[14] which could be obtained for successful emissions reductions in certain facilities, had already been issued from 2000 onwards. These CERs could be used to fulfil a party's emissions reduction obligation during the first commitment period from 2008 to 2012.[15] This early start allowed investors to implement projects in developing states even before the KP came into force in 2005.

Contemporary commentators hailed these flexible or market mechanisms, together with the KP's provisions on compliance, as remarkable institutional innovations.[16] The design of the CDM in particular was ambitious, as it aimed to realise cost-effective emissions reduction *and* sustainable development in developing states. Pursuant to Article 12 (2) KP, the purpose of the CDM should be to assist parties "not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention," and to assist Annex I parties in "achieving compliance with their quantified emission limitation and reduction commitments" under Article 3 KP. The wording of this paragraph mentions "sustainable development" and the "objective of the Convention" before it refers to emissions limitation and reduction commitments of Annex I parties. For the evaluation of this mechanism's performance, the inclusion of these aims is not a trivial matter.

The market mechanisms of the KP are entailed in its Articles 6 (JI), 12 (CDM), and 17 (IET). In the context of environmental regulation, the term "market mechanism" generally describes a policy

[10] Pursuant to 23 Article UNFCCC, for the KP to enter into force ratification, acceptance, approval or accession was needed of at least 55 parties to the UNFCCC that included the parties listed in Annex I and represented at least 55% of the of the total 1990 carbon dioxide emissions of the Annex I parties. *See*, "Status of Ratification of the Kyoto Protocol," http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php.
[11] The specific percentages of emissions reductions for each party are included in Annex B to the KP.
[12] Article 3 (1) KP.
[13] Articles 12, 6, and 17 KP.
[14] Each CER stands for the reduction of one tonne of CO_2 equivalent (CO_2eq).
[15] Article 12 (10) KP.
[16] *See*, for instance, Soltau, Friedrich, *Fairness in International Climate Change Law and Policy*. Cambridge: Cambridge University Press, 2009, 59–60; Brunnée, Jutta, "A Fine Balance: Facilitation and Enforcement in the Design of a Compliance Regime for the Kyoto Protocol," *Tulane Environmental Law Journal* 13, no. 2 (2000): 223–70.

instrument that tries to utilise market forces for the reduction of pollution and/or the costs of compliance.[17] The three Kyoto mechanisms were intended to give parties, which had binding emissions reduction obligations, some degree of flexibility in meeting their targets. Yet, the use of the market mechanisms under the KP should only be "supplemental to domestic action."[18]

The rationale for including these instruments in the UN climate regime was twofold. First, the mechanisms were a means to provide funding and technology for promoting sustainable development in developing states. Second, the mechanism should enable industrialised developed states that had binding obligations under the KP to increase the cost-effectiveness of emissions reduction measures. Developed states were thus allowed to implement emissions reduction projects in other developed states, including states with economies in transition to market economies (JI), and in developing states (CDM). Moreover, international trading of carbon credits would make available extra funding for mitigation and adaption.

Many analysts expected that these instruments could help developed states with binding emissions reduction obligations to lower the costs that they were going to occur in meeting their targets.[19] Some even suggested that the CDM could potentially reduce the overall costs of Annex I parties "to close to zero while bringing real income gain to some non-Annex I countries."[20] Eventually, the CDM became the market mechanism under the KP that developed most dynamically, as will be discussed in depth below. The two other mechanisms – Joint Implementation (JI) and International Emissions Trading (IET) – could only partially evolve for several reasons.

JI was intended as a project-based mechanism through which an investor from an Annex I state party could achieve emissions reductions by implementing projects in another Annex I state. These projects relied on Article 3 KP that allowed Annex I parties to fulfil their obligations jointly. Credits earned from these projects – emission reduction units (ERUs) – were deducted from the host country's assigned amount units, i.e. the allowance of emission permits that the country was allocated under the KP. Investors could accumulate the permits or sell them to another state in need

[17] Hsu, Shi-Ling, "International Market Mechanisms," in *The Oxford Handbook of International Climate Change Law*, ed. Cinnamon P. Carlarne, Kevin R. Gray, and Richard Tarasofsky (Oxford: Oxford University Press, 2016), 241; Hsu, Shi-Ling, "Fairness versus Efficiency in Environmental Law," *Ecology Law Quarterly* 31, no. 2 (2004): 303–401.

[18] Article 6 (1) (d) KP contains "supplementary" provision with respect to JI; Article 17 KP specifies that emissions trading should be "supplemental to domestic action." Article 12 (3) (b) KP states that parties can only use CERs from CDM projects to comply "with part of their quantified emission limitation and reduction commitments under Article 3." *See* also, Yamin et al, "Kyoto Mechanisms: Key Issues for Policy-makers for COP-6." *International Environmental Agreements: Politics, Law and Economics* 1, no. 2 (2001): 190–1.

[19] On a more realistic note, John P. Weynant and Jennifer N. Hill introduce to several models to calculate the mitigation economics of the KP. They observe that "the emissions trajectory prescribed in the Kyoto Protocol is neither optimal in balancing the costs and benefits of climate change mitigation, nor cost effective in leading to stabilization of the concentration of carbon dioxide at any level above about 500 ppmv."; see, Weynant, John P., and Jennifer N. Hill," *The Energy Journal* 20, special issue (1999): xliv; *see* for an overview of possible cost savings, Organisation for Economic Co-operation and Development (OECD), *Action against Climate Change: The Kyoto Protocol and beyond*. Paris: OECD, 1999, 41–2.

[20] Yamin et al, 2001, 192.

of permits to emit greenhouse gases. Thus, in order to save costs investors from highly industrialised countries could opt for inexpensive projects in former socialist states of eastern Europe or the Russian Federation. These states had a surplus in their allowances during the first commitment period. Under the JI mechanism, the host countries on their part would benefit from the transfer of modern technology to generate clean energy or to enhance energy efficiency.[21]

However, the JI market mechanism did not make much progress, mainly because non-transparent approval procedures and unfavourable political circumstances in some host countries and uncertainty whether the KP would ever enter into force impeded its development.[22] In addition, several eastern European states became part of the EU emissions trading system (EU ETS) following the EU enlargement rounds of 2004 and 2009.[23] To avoid double counting, projects undertaken within the realm of the EU ETS were not eligible for emissions reduction units under the JI mechanism.[24]

Establishing an international market for emissions credits requires certifying emissions reductions. Article 17 KP stipulates the possibility to institute a system for emissions trading that helps parties to meet their reduction targets. Since this article does not elaborate on any rules, the conference of the parties had to further define principles, modalities, rules, and guidelines in subsequent meetings. Eventually, the 2001 Marrakech Accords[25]detailed the regulatory framework. The inclusion of the emissions trading as one flexibility mechanism in the KP inspired the creation of the EU ETS. Subsequently, emissions markets were created in other developed states, mostly at sub-national levels. Since it was not possible to establish a global or international emissions market under the KP or at least link several markets during the first commitment period, the international emissions trading was mainly driven by the EU ETS and its provisions.[26]

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[21] Soltau, 2009, 75–9.

[22] Russia ratified the KP in 2004, which was essential for the KP's entry into force. Before that time, uncertainty affected investment decisions. The first commitment period lasted from 2008 to 2012. For many states, cooperation under JI only covered a very brief period of time, as most eastern European states that could have participated in JI projects joined the EU in 2004. Subsequently, uncertainty spread again, mainly because of indecision among states parties on whether and how to extend the KP commitment period. *See*, Vasa, Axel, and Axel Michaelowa, "Uncertainty in Climate Policy: Impacts on Market Mechanisms," in *Climate Change and Policy*, ed. Gabriele Gramelsberger, and Johann Feichter (Heidelberg: Springer, 2011), 127–44.

[23] Soltau, 2009, 75–9.

[24] The EU ETS allowances are specific Kyoto units. Transactions in EU allowances are automatically recorded as transactions under the Kyoto Protocol. United Nations Framework Convention on Climate Change, "Registry Systems under the Kyoto Protocol," http://unfccc.int/kyoto_protocol/registry_systems/items/2723.php; see also Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, OJ L 275, 25.10.2003, pp. 32–46; and, specifically, the so-called Linking Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms, OJ L 338, 13.11.2004, recital 10.

[25] The Marrakesh Accords, Decision 2/CP.7 (FCCC/CP/2001/13/Add.1), 10 November 2001.

[26] Bodansky et al, 2017, 190–2; Soltau, 2009, 84–5.

The following discussion thus focuses on the CDM. In fact, this mechanism became one of the most prominent features that connected developed states' climate policies with activities in developing states. Moreover, other than JI and emissions trading the CDM's regulatory design created an opportunity for fostering a global conversation on how to mitigate climate change. This specific form of climate cooperation involved more states parties and has continued over a longer period of time than other market mechanisms.

Although the inclusion of CDM in the KP took many observers by surprise,[27] its roots can be found in proposals already made during the negotiation of the UNFCCC.[28] The main thrust of the CDM was to allow Annex I parties to invest in projects in developing states and use the emissions that these projects help to avoid, in order to meet their own emissions reduction targets. In fact, the CDM combined joint implementation and emissions trading. The CDM uniquely allowed Annex I parties to increase their own emissions cap through emissions credits derived from investing in a CDM project in a non-Annex I country. This was remarkable, as there were no precedents for emissions trading between states that had a cap for particular emissions and those that were "uncapped."[29]

During the negotiation of the KP, developing states only reluctantly agreed to the inclusion of the CDM,[30] as they feared that detailed reporting on their greenhouse gas emissions would violate their national sovereignty. They were also afraid that developed states would outsource their emissions reduction efforts. Eventually, developing states went along with a "mechanism" that could provide funding for clean development projects in non-Annex I states.[31] As already mentioned, CDM projects were required to promote sustainable development in non-Annex I states, they should contribute to the "ultimate objective of the Convention" and "assist" Annex I parties in complying with their emissions reduction targets.[32]

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[27] Werksman, 1998, 147.

[28] The CDM, as included in the KP, derived from a proposal initially made by Brazil. Together with the U.S., Brazil convinced other developing states to support the introduction of this market mechanism. *See*, Environmental Negotiations Bulletin (ENB), "Report of the Third Conference of the Parties to the United Nations Framework Convention on Climate Change: 1–11 December 1997," Volume 12, Number 76, 13 December 1997, https://enb.iisd.org/download/pdf/enb1276e.pdf, p. 15; *see* for the initial proposal of a clean development fund by Brazil, Implementation of the Berlin Mandate: Additional Proposals from Parties (FCCC/AGBM/1997/MISC.1/Add.3), 30 May 1997, paras 12–5; see for a brief overview of the different proposals, Figueres, Christiana, "Sectoral CDM: Opening the CDM to the Yet Unrealized Goal of Sustainable Development," *McGill International Journal of Sustainable Development Law and Policy* 2, no. 1 (2006): 8–10.

[29] Meijer, Ernestine, and Jacob Werksman, "Keeping It Clean: Safeguarding the Environmental Integrity of the Clean Development Mechanism," in *Legal Aspects of Implementing the Kyoto Protocol Mechanisms*, ed. David Freestone and Charlotte Streck (Oxford: Oxford University Press, 2005), 192, 194.

[30] China and India particularly opposed the introduction of this mechanism. *See*, ENB, 1997, 15.

[31] Other than initially proposed by developing states, Article 12 KP does not entail a rigid limitation to "domestic action" for developed parties' emission reductions. *See*, Werksman, 1998, 148, 151–2; see for an initially proposed requirement of domestic action by Annex I parties, Proposals for a Protocol or another Legal Instrument: Negotiating Text by the Chairman (FCCC/AGBM/1997/3/Add.1), 22 April 1997, para 121.4.

[32] Article 12 (2) KP.

An important aspect of the CDM was the so-called additionality of the projects that are certified under the CDM. To be eligible for CERs, CDM projects not only had to accrue "real, measurable, and long-term benefits related to the mitigation of climate change."[33] They also had to be "additional to any [reduction in emissions] that would occur in the absence of the certified project activity."[34] This means that the emissions reduction would not be achieved in a "business-as-usual" scenario. Since the proof of whether the emissions reduction would also have occurred in the absence of the CDM project was counterfactual, it had to be assessed against an assumed baseline. Thus, a CDM project could obtain CERs when it went beyond the usual way of doing business in the sector and locality in question.[35] The requirement of additionality was a crucial aspect of the mechanism's environmental integrity.[36]

The issue of additionality was central to the certification procedures that guided the validation of CDM projects.[37] However, it took quite some time to make rules for these and other matters related to the implementation of the CDM. During the meeting of the parties to the KP in Marrakech in 2001, many negotiators underestimated the critical role of additionality for the environmental integrity of the KP.[38] They deferred the task of defining specific rules to the CDM Executive Board (EB). In 2003, the EB developed test criteria to establish additionality for small-scale CDM projects.[39]

In 2005, Decision 3/CMP.1 of 2005 on the *Modalities and Procedures for a Clean Development Mechanism as Defined in Article 12 of the Kyoto Protocol* defined the concept of additionality with respect to the CDM and specified a baseline to determine this threshold.[40] Decision 4/CMP.1 confirmed the CDM rules that the EB had developed.[41] Generally, baseline scenarios identified

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[33] Article 12 (5) (b) KP.

[34] *See* Article 12 (5) (c) KP.

[35] Voigt, Christina, "Responsibility for the Environmental Integrity of the CDM: Judicial Review of Executive Board Decisions," in *Legal Aspect of Carbon Trading: Kyoto, Copenhagen, and beyond*, ed. David Freestone and Charlotte Streck (Oxford: Oxford University Press, 2009), 272–94; *see* for a brief overview of the so-called CDM project cycle, Meijers and Werksman, 2005, 197–203.

[36] Environmental integrity describes the ability of an environmental measure to fulfil its objective and purpose. *See* in detail, Voigt, Christina, "Is the Clean Development Mechanism Sustainable?: Some Critical Aspects," *Sustainable Development Law and Policy* 8, no. 2 (2008): 16; see also 6.2.2.

[37] Michaelowa, Axel, "Interpreting the Additionality of CDM Projects: Changes in Additionality Definitions and Regulatory Practices over Time," in *Legal Aspect of Carbon Trading: Kyoto, Copenhagen, and beyond*, ed. David Freestone and Charlotte Streck (Oxford: Oxford University Press, 2009), 249.

[38] There were also quite some substantial differences. Other issues were too technical for being discussed and decided at the level of the conference of parties. Moreover, the representatives of developing states lacked the understanding of the matters. *See*, Michaelowa, 2009, 251.

[39] The seventh meeting of the Executive Board identified barriers that would otherwise have prevented the realisation of the CDM project – i.e. investment, technological, practical and regulatory, or several other barriers – applicable to small-scale CDM projects. Developers of large-scale projects had to report to the EB and show that the project goes beyond a baseline scenario. Yet, the goal was to promote the implementation of small-scale projects. See, Meeting Report EB 7 – Annex 6, Attachment A, 20–21 January 2003; see also Michaelowa, 2009, 251–2.

[40] Modalities and Procedures for a Clean Development Mechanism as Defined in Article 12 of the Kyoto Protocol, Decision 3/CMP.1 (FCCC/KP/CMP/2005/8/Add.1), 30 March 2006, paras 37 (d), and 43–52.

[41] Guidance Relating to the Clean Development Mechanism, Decision 4/CMP.1 (FCCC/KP/CMP/2005/8/Add.), 30 March 2006; see also, Michaelowa, 2009, 251.

barriers that would prevent a project's implementation without the CDM. If the CDM could help to overcome such barriers, it was eligible for certification. After 2005, the rules and procedures were further refined, responding to problems with the initial test criteria.[42] Despite the creation of elaborated guidelines and tests, the implementation of CDM projects led to much criticism. Ultimately, serious malpractices that invalidated the purpose of the CDM had a negative impact on the legitimacy of the KP, as the following subsection shows.

6.2.2. Incoherent projects and airy credits at low prices

The evolution of the CDM offers valuable insights for an assessment of the KP's performance as a first attempt to regulate the reduction of global greenhouse gas emissions. Indeed, the objectives of the CDM and its design provide criteria for evaluating the Protocol's functioning. As already mentioned, Article 12 (2) KP states three objectives of the CDM. A CDM project must assist non-Annex I parties to achieve sustainable development; it has to contribute to the stabilisation of the greenhouse gas concentration in the atmosphere and help Annex I parties to comply with their emissions reduction obligations.[43] The CDM could have become a means to foster a global discourse between developed and developing states on climate policy and international cooperation to reduce the concentration of greenhouse gases in the atmosphere. Yet, there was quite some reluctance on both sides to genuinely embrace this opportunity.

Although Article 12 KP clearly emphasises the component of sustainable development in implementing CMD projects, the conference of parties was unable to define the concept of sustainable development in the context of the CDM. At the conference of parties in Marrakech in 2001, developing states resisted a general definition of sustainable development for the purpose of specifying the CDM design.[44] As a result, the CDM rules do not entail a universally accepted approach and methodology for assessing sustainability aspects of CDM projects. Among the host states of CDM projects, there have been considerable variations concerning sustainability requirements, while the benefits of CDM projects in terms of promoting sustainable development that were stated in the documents to apply for approval were often "hypothetical."[45]

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[42] *See* in more detail, Michaelowa, 2009, 256–63.
[43] Article 12 (2) KP.
[44] Developing states considered the idea of mandatory environmental and sustainable impact assessment for all CDM projects as an infringement on the sovereignty of potential host states. Therefore, domestic standards and rule-setting prevailed with respect to analysing environmental impacts of CDM projects. *See* also, Bakker et al, "The Future of the CDM: Same Same, but Differentiated?," *Climate Policy* 11, no. 1 (2010): 761; Voigt, 2008, 20.
[45] Subbarao, Srikanth, and Bob Lloyd, "Can the Clean Development Mechanism (CDM) Deliver?," *Energy Policy* 39, no. 3 (2011): 1602.

Since political elites of host states determined how sustainable development was interpreted, their definition usually centred on general economic development objectives. Project developers mainly paid attention to the demand on the market for CERs. Cursory information about sustainable development regarding the benefits beyond greenhouse gas emissions reduction was usually sufficient to obtain approval for CDM projects. The actual sustainability effects were not monitored during the course of a project.[46]

The history of the CDM might explain this development. John C. Cole observes that the CDM originally derived from a Brazilian proposal that was further negotiated with the U.S. and then incorporated into the KP. Cole draws attention to the fact that this proposal saw sustainable development in the mere existence of the CDM project, as the project helped to decouple emissions growth from economic development. Based on this narrow conceptualisation of sustainable development, the CDM fulfilled its objectives.[47]

However, for a project-based mechanism this benchmark is hardly convincing, as a decoupling of emissions growth and economic development can only be assessed on an economy-wide scale. Local environmental effects of CDM projects cannot be ignored, given the objective of promoting sustainable development that the CDM should pursue. In this context, another aberration concerned the kind of greenhouse gas emissions that CDM projects sought to reduce.

Projects that achieved large amounts of CERs often limited the emission of greenhouse gases other than CO_2. The CDM thus failed to direct financing to renewable energy sources. Projects that sought to assist developing states in their low-carbon transition were underrepresented in terms of volume. Initially, only 10% of the total amount of CERs derived from renewables projects.[48] Obviously, this project-based approach, even if renewables projects were concerned, fell "far short of being an effort to decarbonize the national economy or even a specific sector of the economy in developing countries."[49] Considering this combination of conceptual insufficiencies, procedural loopholes, and political and economic interests, the CDM hardly contributed to the promotion of transformative low-carbon policies that was one of the most vital elements in the context of achieving sustainable development.[50]

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[46] Bumpus, Adam G., and John C. Cole, "How Can the Current CDM Deliver Sustainable Development?," *WIREs Climate Change* 1, no. 4 (2010): 541, 543–4; Subbarao and Lloyd, 2011, 1610; Voigt, 2009, 277.

[47] Cole, John C., "Genesis of the CDM: The Original Policymaking Goals of the 1997 Brazilian Proposal and Their Evolution in the Kyoto Protocol Negotiations into the CDM," *International Environmental Agreements* 12, no. 1 (2012): 56–8.

[48] Renewables projects made up about 40% of all projects. Yet, these projects were more capital intensive and generated fewer CERs compared to other large-scale CDM projects. See Pearson, Ben, "Market Failure: Why the Clean Development Mechanism Won't Promote Clean Development," *Journal of Cleaner Production* 15, no. 2 (2007): 247–8.

[49] Figueres, 2006, 7.

[50] Bumpus and Cole, 2010, 541, 543–4; Pearson, 2007, 247–8; Figueres, 2006, 7, 11.

Analysts who criticised the performance of the CDM deployed broader definitions of sustainable development that (at least) included environmental side-effects of CDM projects. They generally emphasised that for the environmental integrity of the CDM it was vital to achieve both sustainable development and emissions reductions through the implementation of the CDM projects. Thus, the overall environmental performance of the projects had to be at the centre of the attention,[51] together with the issue of additionality.

Obviously, the CDM created pervasive incentives to generate CERs in order to expand the emissions cap in an Annex I state.[52] Thus, the question must be asked why states implemented a mechanism whose contribution to the reduction of greenhouse gas emissions was questionable at best,[53] if it was not even beneficial to local communities and their surrounding environment.

The answer to this question is rather simple. The CDM established a well-functioning commodity market. This market awarded most funding to projects that delivered a maximum amount of CERs. The objective of achieving cost-effective emissions reductions clearly dominated the considerations of the contracting parties who were involved in CDM projects in developing states.[54] Both the investors and their partners in the host countries had the same short-term interests.[55] As a result, dodgy projects were initiated to sell airy emissions credits. In combination with serious structural problems to assess the additionality requirement of CDM projects, this development had significant consequences for the environmental integrity of the CDM and the KP – i.e. for fulfilling the environmental objective and purpose.

Utilising market mechanisms to solve pollution seems to be an inexpensive and forward-looking approach. Shi-Ling Hsu emphasises that market-based measures are the most efficient means to reduce pollution. Well-functioning markets can exploit the cost heterogeneity of reducing pollution, in particular in a global regime. However, implementation issues, political resistance, and exemptions, which generally decrease the effectiveness, must also be taken into account.[56]

Indeed, the carbon market is different from other commodity markets, as political action is necessary to create and develop it.[57] From the outset, the CDM was designed to establish an transnational infrastructure for cost-effective emissions reductions,[58] in order to finance emissions

[51] Voigt, 2008, 15.
[52] Meijer and Werksman, 2005, 192.
[53] The subsequent discussion in this subsection shows that the CDM was particularly problematic from the perspective of the projects' environmental integrity.
[54] Pearson, 2007, 249–50; Subbarao and Lloyd, 2011, 1602.
[55] Meijer and Werksman, 2005, 193–4.
[56] Hsu, 2016, 241, 256.
[57] Bernstein et al, "The Tale of Two Copenhagens: Carbon Markets and Climate Governance," *Millennium* 39, no. 1 (2010): 173.
[58] Bumpus and Cole, 2010, 543.

reduction projects and to trade CERs. By participating in the CDM, Annex I parties could partially use CERs to meet their emissions reduction targets under Article 3 KP.[59] To create a global structure for the CDM, multilateral cooperation was essential. Since global emissions trading did not develop as expected, the EU ETS became the internationally dominant trading scheme.[60] Although the EU ETS reached a considerable size, the intended global trading of emissions credits could not achieve its full potential under the KP.

Furthermore, the objectives of sustainable development and emissions reduction that were included in the CDM constituted a compromise between developing and developed states. But the practice of the CDM was clearly biased towards cost-effectively reducing emissions in order to obtain CERs.[61] In addition, as Axel Michaelowa observes, procedures to assess additionality and subsequent adjustments of these procedures only slowly evolved. Many distortions continued to plague the system. The validation process of CDM projects remained a burdensome issue. After serious flaws had been discovered in the early years, validators started to refuse projects based on additionality criteria. Yet, rejected projects were usually small, while large projects passed the test. Moreover, following the rejection in May 2008 of an attempt by participants in China to register a hydropower plant as CDM projects,[62] renewables projects in China and other developing states were greeted with much suspicion concerning their additionality.[63] Thus, it proved difficult to deploy the additionality test as a means to ensure the environmental integrity of CDM projects.

Christina Voigt emphasises that additionality was not the only relevant issue in the debate about environmental integrity. By registering the CDM project, its potential reduction of greenhouse gases was evaluated. Yet, the validation did not assess the impact of the project activity on the environment. A potential decline in water quality or the water quantity of rivers and the influence on ecosystems and biodiversity were neglected. The Designated National Authorities that approved CDM projects were often ill-informed about additional socio-economic benefits that "more sustainable" CDM projects could deliver. The negotiators of the KP and decisions at subsequent meetings of the parties failed to formulate environmental performance safeguards. As a result, in the

[59] Article 12 (3) (b) KP.
[60] Bernstein, 2010, 165.
[61] Torvanger et al, "A Two-track CDM: Improved Incentives for Sustainable Development and Offset Production," *Climate Policy* 13, no. 4 (2013): 473.
[62] *See*, rejection of Zilenghe 24 MW hydropower project in Yunnan Province, China, https://cdm.unfccc.int/Projects/DB/RWTUV1218634254.73/Rejection/7MZA8LIBHLF49M6SCRIEPJ3PUNWVT5.
[63] Michaelowa, 2009, 269.

process of implementing CDM projects more importance was attached to procedural efficiency and economic feasibility at the expense of sustainable development and environmental integrity.[64]

Cost-effective measures to reduce emissions triumphed over more comprehensive climate policies. Christiana Figueres blames the rigid application of additionality baselines for the delay of more sustainable policies in developing states. Some states even refrained from implementing domestic energy efficiency or renewables policies, as these policies would subsequently have changed the baseline for determining the additionality of CDM projects. Since the CDM projects pursued the same objectives as these policies, the states would not be eligible for CDM projects after they had started implementing these policies. Ironically, projects with questionable sustainability benefits were approved, while the mechanism's additionality criteria held back decarbonisation policies in developing states.[65]

The CDM had the potential of emerging as a means to link the discourses on climate change mitigation in developed and developing states. However, the reality of the CDM could not live up to expectations, both with respect to its environmental contribution and its basic economics. Furthermore, the majority of CDM projects to promote renewable energy sources were privately owned. Under such projects, local communities could hardly benefit in terms of technology and knowledge transfer.[66]

Generally, the implementation of the CDM did not pay sufficient attention to energy-related projects and lacked geographical diversity. By mid-2007, China and India together accounted for about two-thirds of the CERs from CDM projects that had either been registered, were being validated or had been submitted for validation for the period until 2012. Half of these emissions credits would be obtained from projects in China. The country became the dominant player on the supply side of the CERs market, while companies from the EU and Japan were the main buyers.[67] During the early years of the CDM, Chinese companies also profited considerably from technology provided by foreign countries.[68]

Given its dominant position in the CER market, China *de facto* set the price floor for CERs, mainly because the costs of implementing projects were comparatively low. China also provided a broad portfolio of eligible projects. Furthermore, its energy demand was growing rapidly; and

[64] Voigt, 2009, 276–9.
[65] Figueres, 2006, 12–3.
[66] Subbarao and Lloyd, 2011, 1603, 1610.
[67] International Energy Agency (IEA), *World Energy Outlook 2007: China and India Insights*. Paris: OECD/IEA, 2007, 314–5.
[68] About 90% of the projects that were registered in China in 2005 involved technology transfers from abroad. By 2011, this percentage had decreased to 7%. *See*, Warnecke et al, "Analysing the Status Quo of CDM Projects: Status and Prospects," NewClimate Institute – Ecofys, May 2015, https://newclimate.org/wp-content/uploads/2015/05/cdm_evaluation_mainreport_2015.pdf, p. 108.

economies of scale were available. Therefore, China was able to become a big player in the CER market.[69] Energy-related projects made up half of the amount of the credits obtained in China,[70] while in India two-thirds of the credits derived from CDM projects in the energy sector.[71] Yet, until 2012 in both states only one-quarter of the energy-related credits originated from projects that utilised renewable energy sources.[72]

From the outset, China and India had been the main beneficiaries of CDM. However, it appeared that activities in these and other Asian states had peaked by 2015. Furthermore, other regions were unlikely to emulate Asia's successes in participating in the CDM. By that time, the future of the mechanism and ongoing projects was uncertain.[73] The dynamic that the CDM initially had brought about was lost after only 15 years. Finally, at least in terms of regional diversity the CDM did not achieve its full potential to facilitate a long-term exchange about measures to reduce greenhouse gas emissions, including alternatives to fossil-fuel based energy generation.

Accordingly, the practice of CDM did not translate into a global conversation about climate change mitigation. The CDM was of little benefit to small and poor developing states. Even in a reformed CDM that would have enabled more least developed countries to participate in CDM projects the contribution of this form of climate cooperation would only be marginal, as these economies generally lacked the industrial and administrative infrastructure to implement the projects. The participation of least developed countries was "largely symbolic."[74] Eventually, the dominance of Chinese and Indian CDM projects restricted the number of participants in the global exchange about climate change mitigation and prevented the transfer of technology to needier developing states.

To sum up, rather than advancing international cooperation on sustainability, climate change mitigation, and the phaseout of fossil fuels, the CDM went for easy money. Emissions reductions moved to places where they could be implemented cheaply, without much regard for environmental costs. Even before the start of the first commitment period in 2008, it was evident that the CDM

[69] International Energy Agency (IEA), *World Energy Outlook 2007: China and India Insights*. Paris: OECD/IEA, 2007, 314–5.
[70] In 2007, only 11% of the CDM projects in China relied on renewables to obtain CERs. The largest share of registered credits (about 72%) originated from projects to reduce emissions of hydrofluorocarbon HFC-23, a by-product of HCFC-22 that is both a greenhouse and ozone-depleting gas. China was an important producer of HFC-23, while reducing these emissions was very cheap compared to the value of CERs that could be obtained following this process. The revenues from selling CERs could pay off the investments in the projects within one year. *See*, IEA, 2007, 314–5; Pearson, 2007, 250; *see* for an overview of the HFC-23 issue related to the Ozone regime, subsection 4.2.3.2. of chapter four.
[71] IEA, 2007, 239.
[72] Ibid., 238–9, 314.
[73] Warnecke et al, "Analysing the Status Quo of CDM Projects," 2015, pp. 108–9, 116.
[74] De Lopez et al, "Clean Development Mechanism and Least Developed Countries: Changing the Rules for Greater Participation," *The Journal of Environment and Development* 18, no. 4 (2009): 440, 450.

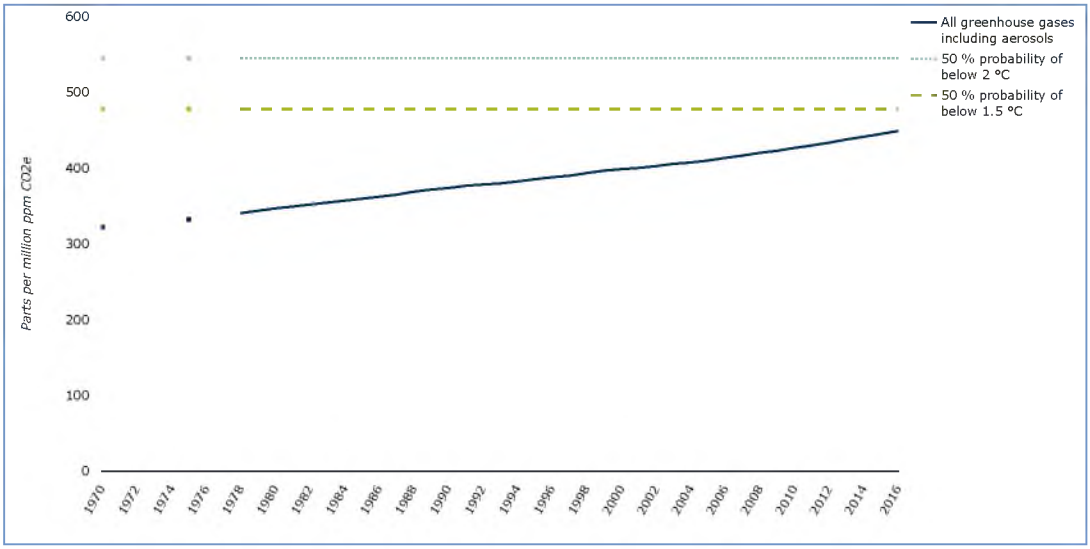
could not deliver on its environmental objectives.[75] Eventually the difficulties and distortions that marred the CDM diverted attention away from more meaningful mitigation efforts and resulted in futile projects. The environmental integrity of the KP suffered considerably, while global greenhouse gas emissions kept rising.

6.2.3. Increasing global emissions and the flaws of the Kyoto approach

The period after the adoption of the KP saw an unprecedented rise in global greenhouse gas emissions that further increased the concentrations of greenhouse gases in the atmosphere (*see* figure 6.1). Among all greenhouse gas emissions, the rise of CO_2 emissions was most remarkable, especially from 2000 onwards. The growth of CO_2 emissions was outpacing the increase of other greenhouse gas emissions (*see* figure 6.2). A regional comparison shows that CO_2 emissions originating from Asia were primarily responsible for the increase. Other parts of the world contributed much less. In Europe, for instance, CO_2 emissions even declined slightly after 2008 (*see* figure 6.3). Furthermore, the regional spread of CO_2 emissions in Figure 6.3 illustrates that there were two periods when emissions rose particularly fast in Asia – i.e. between 2002 and 2006 and from 2009 onwards.

[75] Figueres, 2006, 25.

Figure 6.1: Total atmospheric greenhouse gas concentrations, 1970–2015

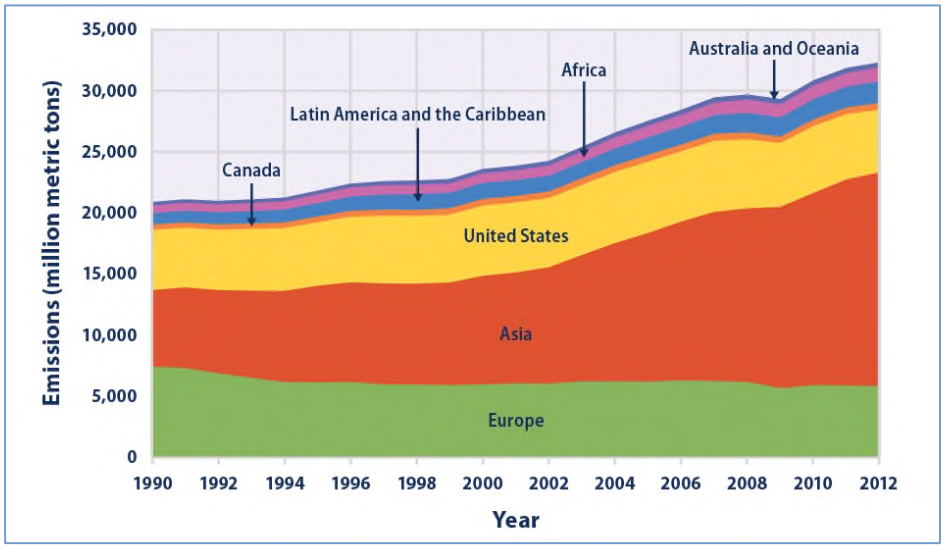


***Source*: European Environment Agency, 2019.**

Figure 6.2: Global GHG emissions per gas, 1970–2017

***Source*: UNEP, 2018 (online), p. 6.**

Figure 6.3: Global carbon dioxide emissions by region, 1990–2012



***Source*: U.S. EPA, 2016.**

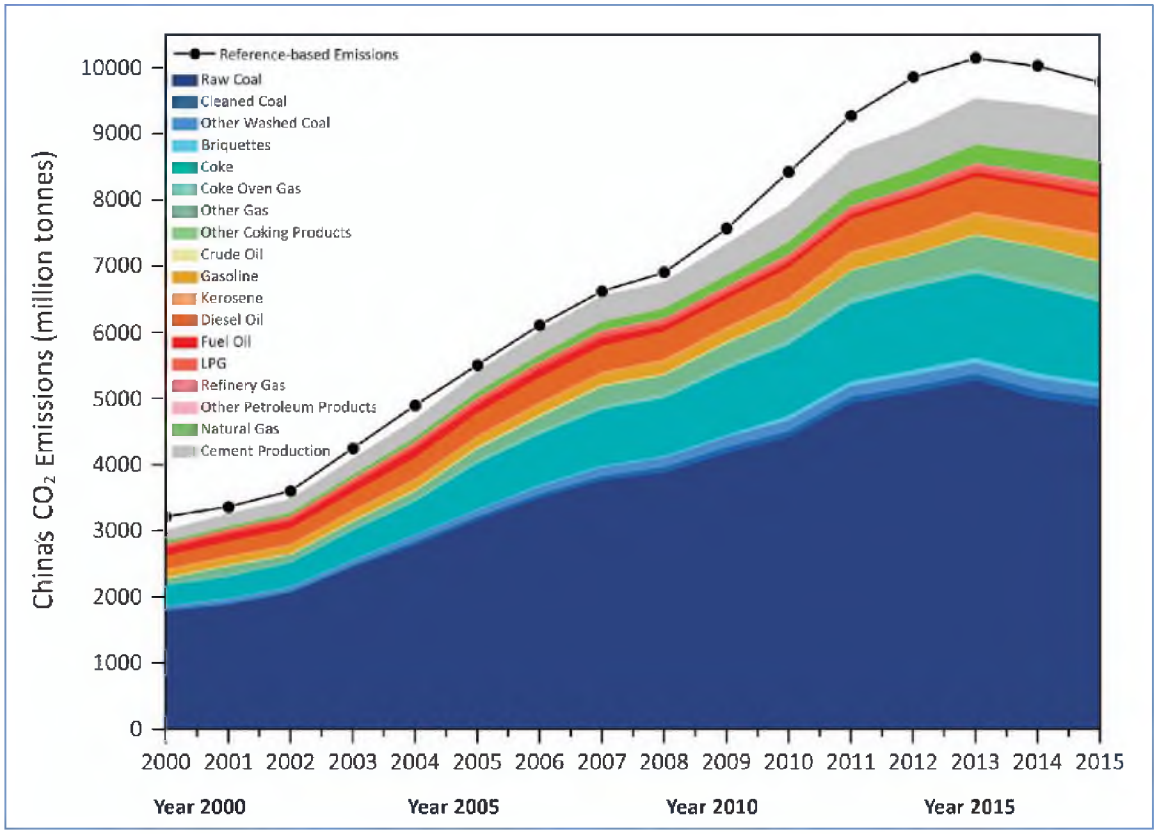
Both instances of rapid emissions growth can be directly linked to domestic policies in China. During the first decade of the 21st century, China expanded its heavy industry and built hundreds of new coal-fired power plants to satisfy increasing demand for electricity and fuel the country's fast growing economy. The second pickup in emissions followed a large-scale investment programme that the Chinese government initiated in late 2008 in order to cope with domestic economic problems and the fallout from the global financial crisis. A stimulus package of RMB4 trillion (€516 billion) was made available to be spent from the end of 2008 through the end of 2010.[76]

From 2009 onwards, government funding was largely used to invest in carbon-intensive infrastructure construction and to support heavy industry. Eventually, the stimulus package changed the determinants of China's CO_2 emissions. Until 2007, the growth in China's CO_2 emissions was predominantly driven by the export of manufactured products. By the end of the decade, however, domestic consumption became the main driver. During the period from 2007 to 2010, more than 70% of CO_2 emissions growth was related to infrastructure and housing construction, which primarily resulted from the implementation of the stimulus programme.[77] Increased demand for energy led to fast growing CO_2 emissions. Figure 6.4 shows that for years the main source for more than half of

[76] Barry Naughton describes the stimulus packages as "a large, activist intervention in the Chinese economy that will shape the trajectory of Chinese development for a decade or more." (p. 1) *See*, Naughton, Barry, "Understanding the Chinese Stimulus Package," *China Leadership Monitor*, no. 28, 8 May 2009, https://www.hoover.org/sites/default/files/uploads/documents/ CLM28BN.pdf, pp. 1–12.
[77] Mi et al, "Pattern Changes in Determinants of Chinese Emissions," *Environmental Research Letters* 12, no. 7 (2017): 8.

these emissions has been *raw* coal, holding a share of 53% in 2015 (*see* the largest and darkest compartment of the graph, figure 6.4.).[78]

Figure 6.4: Sources of China's CO_2 emissions, 2000–2015



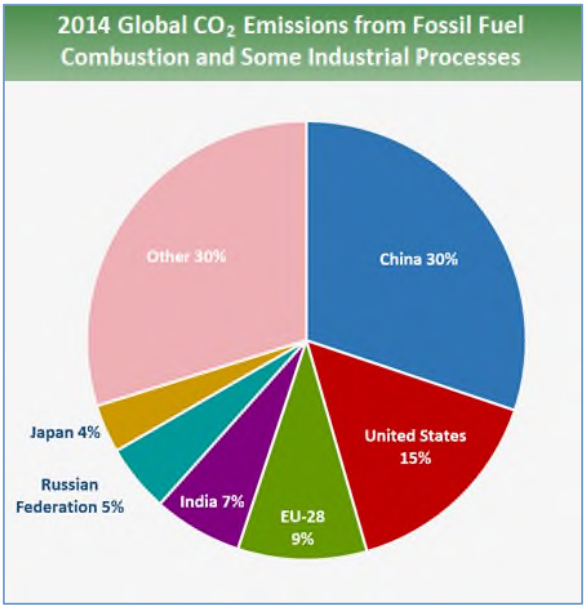
***Source*: Shan et al, 2016, 8.**

Accordingly, China's domestic economic policies had a tremendous impact on the development of global greenhouse gas emissions. Between 2005 and 2015, China's primary energy consumption grew from 1,793.7 to 3,014.0 Mtoe – an increase of 68%. Over the same period, its energy-related CO_2 emissions doubled.[79] In 2014, it accounted for 30% of total global CO_2 emissions (*see* figure 6.5). Since about 2011, China's per capita emissions have been on par with those of the EU member states (*see* figure 6.6). Thus, during the period from 2000 to 2015, China emerged as the by far largest emitter of greenhouse gases (*see* figure 6.7). The country's increase in emissions dwarfed the effect

[78] Shan et al, "Data Descriptor: China CO_2 Emission Accounts 1997–2015," *Nature – Scientific Data* 5, no. 170201 (2018): 8.
[79] BP, "Statistical Review of World Energy – June 2016," June 2016, https://www.bp.com/content/dam/bp/pdf/energy-economics/statistical-review-2016/bp-statistical-review-of-world-energy-2016-full-report.pdf, p. 40; U.S. Energy Information Administration, "International Energy Statistics," https://www.eia.gov/beta/international/.

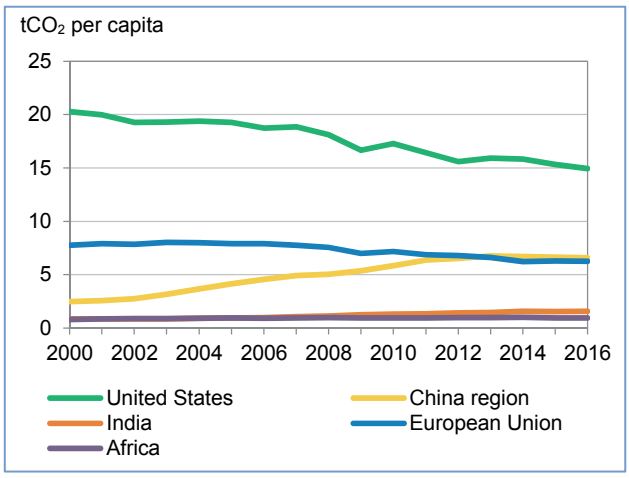
of efforts by Annex I parties to meet their binding emissions reduction targets as well as other actions under the Kyoto mechanisms. Hence, the instruments of the KP were incapable of dealing with the dramatically changed global situation.

Figure 6.5: Shares in global CO_2 emissions from fossil fuel combustion and industrial processes, 2014



***Source*: U.S. EPA; IPCC, 2014.**

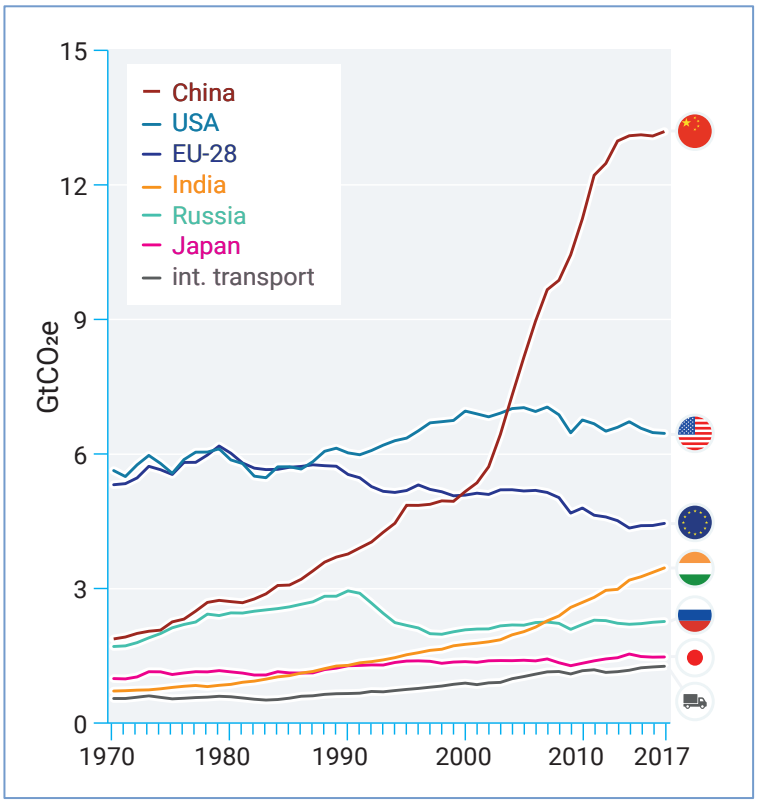
Figure 6.6: Per capita CO_2 emissions for selected regions, 2000–2016



(China region includes Hong Kong)

***Source*: IEA, 2018 (online), p. 10.**

Figure 6.7: Top greenhouse gas emitters, excluding land-use change emissions, 1970–2017



***Source*: UNEP, 2018 (online), p. 6.**

By 2008, it was evident that the implementation of the KP would not lead to global emissions reductions. The trend was even adverse.[80] Global greenhouse gas emissions continued to grow during the first commitment period of the KP. The international community could no longer bind itself to the Protocol's approach to climate change mitigation, if it wanted to be serious about the stabilisation goal that Article 2 UNFCCC states.

Amanda Rosen observes that even with full participation and compliance by all, the KP would not have been able to contribute to climate change mitigation.[81] She identifies four flaws, in addition to the problems with environmental integrity, that the Kyoto process introduced into the UN climate regime. These flaws resulted in "perverse incentives" and thwarted global efforts to mitigate climate change:[82]

[80] Helm, Dieter, "Climate-change Policy: Why Has So Little Been Achieved?," *Oxford Review of Economic Policy* 24, no. 2 (2008): 214.
[81] Rosen, Amanda, "The Wrong Solution at the Right Time: The Failure of the Kyoto Protocol on Climate Change," *Politics and Policy* 43, no. 1 (2015): 34–5.
[82] Ibid., 43, 44.

- a brief timeframe for preparing and implementing the first commitment period; [83]
- inflexible and non-ambitious targets for Annex I parties;[84]
- a wrong approach to the calculation of emissions reduction;[85]
- a path dependence during the commencement of the second commitment period from 2013 to 2020, which prolonged the Kyoto mechanisms and targets;[86]
- disregard for the environmental integrity of climate action.[87]

Consequently, the states parties had to make more efforts and find other means to achieve significant reductions in global greenhouse gas emissions and stabilise the concentration of these gases in the atmosphere. However, such measures would come at higher costs than the negotiators of the KP had envisioned. Dieter Helm notes that in general the cost assumptions of the KP were too low. Indeed, the KP's assumed inexpensive approach to climate change mitigation misrepresented the political economy of climate change.[88] Furthermore, the 2007 Stern Review,[89] an influential analysis of the economics of climate change and mitigation policies, took for granted that the institutions of the KP to mitigate climate change already existed or could smoothly be set up. By relying on these assumptions, the report depicted the potential costs inaccurately.[90] Thus, proponents of the KP clearly underestimated the costs of both implementing the necessary policies in terms of establishing

[83] The first commitment period of five years began about 10 years after the KP was signed. The KP had entered into force only in 2005. Annex I parties had merely three years to design and implement their reduction measures. This short preparation and implementation timeframe led many Annex I parties to choose easy measures instead of engaging in the fundamental transformation that leads to a global low-carbon transition. The brief time horizon limited the available policy options. No incentives were provided for states that would rather have chosen for a long-term climate strategy. *See*, Rosen 2015, 40–1.

[84] The initial emissions reductions targets for Annex I parties were too small. They would lead to a global emissions reduction of 5%. However, the KP did not include a long-term emissions reduction goal or an indication of a limit to global temperature rise. Given this unambitious overall target, together with the short timeframe, states were encouraged to look for methods to achieve the targets quickly. There was no debate about a long-term vision and far-reaching policy measures. The design favoured small-scale, short-term policies. In addition, there was no progression mechanism included in the way the emissions reduction targets were defined. The targets that were set for the second commitment period (2013–20) would also fail to significantly contribute to climate change mitigation. Furthermore, the KP did not distinguish among the different greenhouse gases in the sense that it would urge to deal with short-lived gases first in order to buy time for the large-scale transformation of the fossil-fuel-based energy system. *See*, Rosen, 2015, 41–2; Weaver, Andrew, "Toward the Second Commitment Period of the Kyoto Protocol," Science 332, no. 6031 (2011): 796.

[85] The assessment of emissions reductions was incorrect. Since Annex I parties could obtain CERs for implementing projects in developing states, they could avoid taking far-reaching measures at home. Some states even offset growing emissions by implementing projects abroad. The shift of domestic manufacturing from developed states to overseas destinations had also a beneficial effect on their emission balances. But these reductions clearly did not contribute global reductions. Eventually, global emissions increased. *See*, Rosen, 2015, 42.

[86] The extension of the KP prolonged its short-term approach to climate change mitigation, by committing Annex I parties to reduce emissions by 18% on average by 2020. Once again, the states would only have eight years to prepare, adopt, and implement appropriate policies. The possibility of further commitment periods led to path dependence with respect to originally chosen actions and short-termism. By doing so the regime extended its initial design flaws. *See*, Amendment to the Kyoto Protocol pursuant to its Article 3 (9) (the Doha Amendment), Decision 1/CMP.8 (FCCC/KP/CMP/2012/13/Add.1), 28 February 2013, para 4; Rosen, 2015, 43.

[87] *See*, Voigt, 2009, 272–94; and section 6.2.2.

[88] Helm, 2008, 224–7; *see* also, Barrett, Scott, "Political Economy of the Kyoto Protocol," *Oxford Review of Economic Policy* 14, no. 4 (1998): 20–39.

[89] Stern, Nicholas, *The Economics of Climate Change: The Stern Review*. Cambridge: Cambridge University Press, 2007.

[90] Campbell, David, "After Doha: What Has Climate Change Policy Accomplished?," *Journal of Environmental Law* 25, no. 1 (2013): 135.

new administrations and deploying government resources and the costs of transforming the economy towards a low-carbon development path.

The Protocol's design also neglected the issue of carbon consumption as a result of increasing global trade. From 2000 onwards, global trade surged; and the omission of carbon consumption in the equation had pervasive effects on global emissions.[91] Even before the first commitment period of the KP began in 2008, a reconsideration seemed necessary with respect to the Protocol's design and main substantive provisions. The next section discusses how the parties sought to adjust the Kyoto approach and finally abandoned it.

6.3. Reversal

The previous section discussed the characteristics and performance of the market mechanisms under the KP. In fact, the KP is primarily remembered for this feature. The KP, including its market instruments, largely failed to contribute to the objective of the UNFCCC, which is not the reduction of greenhouse gas emissions but the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[92] The Kyoto approach to emissions reduction through targets and timetables and its differentiated treatment of developed and developing states were among the most controversial issues that the parties sought to revise in the climate negotiations from 2005 onwards, after KP's entry into force. These substantive issues were closely related to the architecture of the KP. The first subsection 6.3.1. gives an overview of the documents that were milestones on road to a gradual adjustment of these salient elements of the UN climate regime. Subsection 6.3.2. then considers the fate of the KP. Finally, subsection 6.3.3. explains how differentiation and mitigation were reassessed during the negotiation process.

6.3.1. A decade-long debate

After the KP entered into force in 2005, it took a decade until, at COP-21, a new "legal instrument" was adopted. The PA entails a major revision of crucial elements of the UN climate regime. The process of adjusting the regime evolved gradually and primarily concerned the most significant flaws of the KP – i.e. stringent differentiation and insufficient global emissions reduction. Many perceived

[91] Helm, 2008, 216, 234.
[92] Article 2 UNFCCC.

the negotiations as a painfully slow process. The COPs that have been taking place at the end of every year since the 1990s usually brought along much drama and disappointment, in particular COP-15 in Copenhagen in 2009 caused great dismay. Back then, many had hoped that this COP would produce a global commitment in order to strengthen mitigation efforts and adequately reflect the sense of urgency, which the 4th IPCC report[93] had conveyed in 2007. Yet, the parties needed more time to address several salient issues.[94]

Generally, the outcomes of the annual COPs fell short of the ambition that was required to mitigate climate change. Nevertheless, it must be noted that the process of reconnecting the UN climate regime's substantive provisions on mitigation and differentiation with the reality of the international political economy occurred in a relatively fast and responsive way.[95] Eventually, it merely took a decade to correct major shortcomings of the Kyoto approach, while at the same time the relevant economic sectors experienced big technological advancement – most notably in the field of energy generation.

Thwarting the threat of dangerously rising global temperatures in a timely manner is the most important parameter that determines the success of the UN climate regime. However, the regime's development must also be assessed from the perspective of international law and specifically international environmental law.[96] When negotiators sought to revise the UN climate regime after the inadequacy of the Kyoto approach had become obvious, they faced the daunting task of meaningfully translating global economic change into the regime without disregarding the principles of the UNFCCC as the regime's basic instrument. This point particularly concerned the CBDR principle that facilitates the participation of developing states in the regime. The institutional and substantive innovations of the PA ended the debate about the flaws of the KP. This debate had dominated the evolution of the UN climate regime for more than a decade. Subsection 6.3.2. summarises how the KP approach was reversed, resulting in a novel architecture.

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[93] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007 Synthesis Report*. Geneva: IPCC, 2008.

[94] Bulmer et al point to the fact that negotiators had only one year to come up with a document. It was impossible to separate contentious technical issues from key political differences. There was no agreement on the legal form of the expected "agreed outcome." Finally, the negotiators could not agree on the post-2012 commitments under the KP. Parties left their climate action during second commitment period unresolved. *See* Bulmer, Jane, Meinhard Doelle, and Daniel Klein. "Negotiating History of the Paris Agreement." In *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 58.

[95] During the period from 2005 until 2015, the global economy experienced a tremendous development in the energy business. This changed markets for fossil fuels and the newly available technologies to utilise renewable sources of energy formed the backdrop of legislative efforts to regulate the decarbonisation of the energy sector. At the same time, China's economic development necessitated a closer look at the way the climate regime categorises states and regulates the differentiation of commitments. Efforts to review this categorisation were driven both by developed states and by many developing states. *See* further 6.4.

[96] Chapter seven will present a legal analyse of the redefined CBDR principle and the substantive mitigation provisions.

6.3.2. Extending and deconstructing the Kyoto Protocol

As soon as the KP entered into force, negotiators began to discuss the rules for the next commitment period that was to begin in 2013.[97] The negotiations concerned interrelated issues that had been shaping the nature of the UN climate regime since the early 1990s. Yet, the debate quickly exceeded the realm of the Kyoto process. In fact, during the period from 2005 to 2015 the annual COPs increasingly paid attention to the future of the UN climate regime in general. Three issues were at the centre of the debate – i.e. the differentiation of commitments, enhanced mitigation efforts, and the architecture of the regime.

Since the late 1990s, it has been clear that the KP's approach to *differentiation* would be inappropriate for global climate cooperation in the long run. By then, the global economy had already changed dramatically. During the first decade of the 21st century, rising global emissions highlighted the fact that *mitigation efforts* had to be increased considerably. The discussion about possible adjustments of the regime made clear that the *top-down architecture* of the KP could not resolve the conflict between more ambitious mitigation targets and the concept of state sovereignty. At the same time there was much disagreement about the criteria on which differentiation of commitments could be based. Eventually, the parties realised that these substantive issues could only be addressed if the architecture allowed for more flexibility. Essentially, COP-15 in Copenhagen marked this crucial turnaround. Thus, despite the big disappointment that many felt after this COP, its outcome was a huge step forward in the history of the regime.

Initial attempts to reform the regime were made during COP-13 that took place in Bali, Indonesia, in 2007. This COP was the first key climate meeting since the adoption of the KP.[98] It instigated the closure of the Kyoto process and started a conversation on the architecture of the regime that helped move away from the top-down approach.[99]

Indeed, initially a top-down approach had been politically attractive for many parties, mainly because it enabled a form of burden-sharing among developed and developing states. This reasoning also informed the establishment of the CDM.[100] Yet, the problem of categorising states equitably proved unsolvable. The Kyoto approach to differentiation needed to be reassessed, while states had to enhance their mitigation efforts. However, from 2005 onwards proposals to address these interrelated issues only gradually coalesced into a meaningful debate. For years, the debate about

[97] The first commitment period lasted from 2008 to 2012.
[98] Bodansky et al, 2017, 110.
[99] *See*, Rajamani, Lavanya, "From Berlin to Bali and beyond: Killing Kyoto Softly?," *International and Comparative Law Quarterly* 57, no. 4 (2008): 937.
[100] Dubash, Navroz K., and Lavanya Rajamani, "Beyond Copenhagen: Next Steps," *Climate Policy* 10, no. 6 (2010): 595.

the fate of the KP remained concerned with institutional issues of the KP's top-down architecture. Substantive provisions on differentiation and mitigation only came to the fore after the parties had abandoned the process to further develop climate action under the premises of the KP.

Being intermediate outcomes of intergovernmental negotiations, the decisions of the COPs reflect the progress of the debate on these institutional issues and indicate milestones in the struggle to strengthen global climate action. The decisions thus help trace the UN climate regime's evolution. In fact, in the UN climate regime COP decisions have acquired "tremendous operational and legal significance,"[101] as language agreed in COP decisions often anticipates subsequent legal texts.[102]

New ideas on how to deal with the flaws of the Kyoto process and reform the UN climate regime had to travel along several negotiation tracks in order to materialise. Three negotiation tracks contributed to the decisions that eventually led to an extension of the KP until 2020 and the adoption of the PA as a new legal instrument under the UNFCCC in 2015:

- Ad Hoc Working Group on Further Commitments for Annex I Parties under the KP (AWG-KP),
- Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA),
- Ad Hoc Working Group on the Durban Platform for Enhanced Action" (AWG-ADP).

The first conference of the parties serving as the meeting of parties to the KP (CMP) established an "open-ended ad hoc working group of Parties to the Kyoto Protocol"[103] (AWG-KP) in 2005 to "consider further commitments for Parties included in Annex I for the period beyond 2012."[104] Article 3 (9) KP required the parties to start this process seven years before the end of the first commitment period. This first negotiation track aimed to deliver amendments to the KP's Annex B, that should quantify future emissions reductions and limitations of developed states. The main intention was to increase the percentages of emissions reduction, compared to 1990, that developed states would be committed to achieve during the second commitment period. This AWG-KP track thus evolved within the parameters of the KP. The 2012 Doha Amendment concluded the AWG-KP track by extending the

[101] Bodansky et al, 2017, 19.
[102] Ibid., 19–20.
[103] The AWG-KP was established during the first meeting of the parties to the KP in Montreal. *See*, Decision 1/CMP.1, (FCCC/KP/CMP/2005/8/Add.1), 30 March 2006, para 2.
[104] In 2005, Montreal, Canada, hosted the first meeting of the parties to the KP. The parties initiated "a process to consider further commitments for Parties included in Annex I for the period beyond 2012." *See*, Decision 1/CMP.1, para 1.

Protocol until 2020.[105] However, this negotiation effort was continuously hampered by debates about more ambitious mitigation efforts and the future of differentiation. Consequently, the outcome, included in the Doha Amendment, could only be delivered with delay.[106] The most contentious issues, especially the emissions by non-Annex I parties, gradually migrated to negotiations tracks that evolved under the UNFCCC.

In 2005, COP-11 convened in Montreal and started a "dialogue"[107] that was conducted "under the Convention"[108] and in parallel with the negotiations about the second commitment period of the KP, the AWG-KP.[109] As already mentioned, during the negotiations under the AWG-KP the issue of the changing global economy and rising emissions from states (non-Annex I parties) with no emissions reduction obligations under the KP was increasingly debated.[110] The "dialogue" was thus mandated to "analyse strategic approaches for long-term cooperative action to address climate change."[111]

In 2007, the Bali Action Plan institutionalised this second negotiation track, the "dialogue," by installing the "Ad Hoc Working Group on Long-term Cooperative Action under the Convention" (AWG-LCA). COP-13 thus launched "a process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012."[112] This process aimed to achieve "an agreed outcome" that could be adopted at COP-15 in 2009.[113]

With the Copenhagen Accord,[114] COP-15 could produce a new document that the majority of parties supported. Yet, this document constitutes a political agreement that did not become part of the official decisions under the UN climate regime. The parties only took note of the Copenhagen Accord.[115] Although the parties had failed to realise the goal of concluding an agreement on the long-term climate action under the UNFCCC, they decided to proceed based on the content that AWG-LCA

[105] Amendment to the Kyoto Protocol pursuant to its Article 3, paragraph 9 (the Doha Amendment), Decision 1/CMP.8 (FCCC/KP/CMP/2012/13/Add.1), 28 February 2013.
[106] Bulmer et al, 2017, 54; *see* also an overview of the negotiations tracks at Bulmer et al, 2017, 57.
[107] Dialogue on long-term action to address climate change by enhancing implementation of the Convention, Decision 1/CP.11 (FCCC/CP /2005/5/Add.1), 30 March 2006.
[108] Ibid., para 1.
[109] Consideration of commitments for subsequent periods for Parties included in Annex I to the Convention under Article 3, paragraph 9, of the Kyoto Protocol, Decision 1/CMP.1 (FCCC/KP/CMP/2005/8/Add.1), 30 March 2006, para 2.
[110] Bulmer et al, 2017, 54.
[111] Decision 1/CP.11, para 1.
[112] Bali Action Plan, Decision 1/CP.13 (FCCC/CP/2007/6/Add.1), 14 March 2008, paras 1, 2.
[113] Decision 1/CP.13, paras 1, 2.
[114] Copenhagen Accord, Decision 2/CP.15 (FCCC/CP/2009/11/Add.1), 30 March 2010.
[115] *See*, Decision 2/CP.15.

negotiation track had already achieved.[116] In fact, the Copenhagen Accord contained important substantive provisions on which political agreement had been reached, such as a bottom-up approach to emissions reduction commitments and "nationally appropriate mitigation actions" of developing states.[117] Eventually, many concepts that are part of the Copenhagen Accord reappeared in subsequent COP decisions.[118]

The 2010 Cancun Agreements[119] were instrumental in integrating the Copenhagen Accord into the negotiation track under the UNFCCC. Salient issues that transitioned from the Copenhagen Accord to the Cancun Agreements include the goal of limiting global warming to 2˚C above pre-industrial levels [120] and nationally determined mitigation pledges.[121] The Cancun Agreements mention the 2˚C goal in its fourth paragraph and continues to separately set out "nationally appropriate mitigation commitments or actions" for developed and "nationally appropriate mitigation actions" for developing states.[122] Hence, by incorporating these novel provisions into the UN climate regime, the Cancun Agreements facilitated both the continuation of the negotiation process under the UNFCCC and the regime's reconstruction.

A contemporaneous assessment concluded that the Cancun Agreements were indicative for the future regime. The resulting path of the negotiations was "likely to forsake the Kyoto Protocol" and end its targets and timetables approach and unique form of differentiation, while the future of UN climate regime was likely "to be structured around symmetrical obligations relating to self-selected mitigation targets and actions and a robust MRV system."[123] Accordingly, the COP in Copenhagen formed a major turning point in the evolution of the climate regime and created an opportunity to shed the Kyoto approach and gather momentum for a new agreement.

COP-17 that took place in Durban in 2011 was the last crucial intermediate step before the adoption of the PA. The Durban Platform[124] concluded the AWG-LCA negotiation track[125] and gave an

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[116] Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, Decision 1/CP.15 (FCCC/CP/2009/11/Add.1), 30 March 2010, para 1.
[117] Decision 2/CP.15, paras 4 and 5.
[118] The political consensus achieved in Copenhagen was the foundation of the Cancun Agreements and essentially provided a template for the Paris Agreement. *See*, Bulmer et al, 2017, 59; Bodansky et al, 2017, 21.
[119] The Cancun Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, Decision 1/CP.16 (FCCC/CP/2010/7/Add.1), 15 March 2011.
[120] Decision 2/CP.15, paras 1, 2.
[121] Annex I parties should "commit to implement individually or jointly the quantified economy-wide emissions targets for 2020," while non-Annex I parties would "implement mitigation actions;" *see* Decision 2/CP.15, paras 4, 5, respectively.
[122] Decision 1/CP.16, paras. 4, 36 et seq., 48 et seq.
[123] MRV stands for "measurement, reporting and verification." *See* for citation, Rajamani, Lavanya, "The Cancun Climate Agreements: Reading the Text, Subtext and Tea Leaves," *International and Comparative Law Quarterly* 60, no. 2 (2011): 500, 519.
[124] Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action, Decision 1/CP.17 (FCCC/CP/2011/9/Add.1), 15 March 2012.
[125] The first paragraph of Decision 1/CP.17 entails the decision that the AWG-LCA would be terminated at COP-18.

indication on the second commitment period[126] under the KP. Most importantly, COP-17 initiated a third negotiation track, which became known as the "Ad Hoc Working Group on the Durban Platform for Enhanced Action" (AWG-ADP). This track aimed to "develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties."[127] It operated under the UNFCCC and was expected to complete its work by 2015.[128]

By agreeing to extend the KP until 2020, developed states were able to push for negotiations about an outcome whose architecture would eventually be very different. As mentioned above, the 2007 Bali Action Plan[129] contained the first steps towards a reversal of the top-down architecture. The almost identical phrasing of "nationally appropriate mitigation commitments or actions" for developed and "nationally appropriate mitigation actions" for developing states for the first time communicated the necessity that developing states, at least those with large amounts of emissions, would accept meaningful mitigation commitments. By doing so, the parties would end the stringent differentiation under the KP.[130]

Subsequent COP decisions refined the political consensus on mitigation cooperation and gradually moved to more symmetry with respect to the formulation of developed and developing states' commitments. It was expected that the structure of the Durban Platform would lead to symmetry instead of differentiation as the "central organising principle" of the UN climate regime.[131]

On the range of rigidity with respect to a top-down determination of commitments, the KP is on the most extreme end, while the Copenhagen Accord with its pledges contains the least rigorous solution. The Copenhagen Accord maintains the annex-based categorisation of states of the UNFCCC. It urges Annex I states to "strengthen" their emissions reduction targets and mentions that non-Annex I states "will submit nationally appropriate mitigation actions."[132] The 2011 Cancun Agreements, as outcome of the AWG-LCA process, "urges" Annex I states "to increase the ambition of their economy-wide emission reduction targets"[133] and "invites" developing states "that wish to voluntarily inform the Conference of the Parties of their intention to implement nationally

[126] Decision 1/CP.17 noted the decision of the meeting of the parties to the KP (CMP-7) – Decision 1/CMP.7. Paragraph 1 of Decision 1/CPM.7 entailed the decision that the second commitment period should begin on 1 January 2013 and end on either 31 December 2017 or 31 December 2020. The 2012 Doha Amendment states 31 December 2012 as the end of the second commitment period. *See*, Amendment to the Kyoto Protocol pursuant to its Article 3, paragraph 9 (the Doha Amendment), Decision 1/CMP.8 (FCCC/KP/CMP/2012/13/Add.1), 28 February 2013, para 4.
[127] Decision 1/CP.17, para 2.
[128] Ibid., para 4.
[129] The Bali Action Plan stipulates that developed states should undertake "nationally appropriate mitigation commitment or action" and developing states should take "nationally appropriate mitigation action." *See* Decision 1/CP.13, para 1 (b) (I) and (II).
[130] *See* in more detail, subsection 6.4.3. for the development of substantive provisions on mitigation and differentiation.
[131] Rajamani, Lavanya, "The Durban Platform for Enhanced Action and the Future of the Climate Regime," *International and Comparative Law Quarterly* 61, no. 2 (2012): 501.
[132] Decision 2/CP.15, paras 4, 5.
[133] Decision 1/CP.16, para 37.

appropriate mitigation actions … to submit information on those actions to the secretariat."[134] Nationally appropriate mitigations actions were then made public separately for Annex I states[135] and non-Annex I states.[136] Interestingly, the communication of the Annex I states was made under the KP, while non-Annex I submitted their actions as part of the AWG-LCA negotiation track under the UNFCCC. At that time, it was still inevitable to institutionally separate mitigation contributions between developed and developing states. Yet, in subsequent decisions the phrasing of commitments increasingly converged, giving way to a re-imagination of UN climate regime's architecture.

COP-17, held in Durban in late 2011, was decisive in reversing the Kyoto process and paving the way for a new architecture, mainly because this COP freed the negotiations from the annex-based approach and helped to move towards more "legal parity"[137] between developed and developing states.

As mentioned earlier, three decisions that were taken in Durban stand out, mainly because they were the key to further streamlining the negotiation process on the architecture of the future regime. First, COP-17 ended the AWG-LCA process[138] that some developed states had feared would otherwise continue the binary division of the UNFCCC annexes.[139] Second, the meeting of the parties to the KP agreed to decide about the extension of the second commitment period until 2020 and the conclusion of the AWG-KP process at the meeting in Doha in 2012.[140] Third, the COP launched a new negotiation process – the Ad Hoc Working Group on the Durban Platform for Enhanced Action (AWG-ADP) – to produce a new instrument by 2015.[141] This allowed the parties to focus on a single process to develop the new architecture of the regime.[142] Indeed, after COP-18 in Doha in 2012 the negotiations shifted from debating the process to dealing with substance.[143]

During COP-19 in Warsaw, the states parties proceeded on the path of promoting the notion of self-determination of their commitments or contributions and increasingly considered a hybrid

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[134] Ibid., para 50.
[135] Compilation of economy wide emission reduction targets to be implemented by Parties included in Annex I to the Convention (FCCC/SB/2011/INF.1/Rev.1), 7 June 2011.
[136] Compilation of information on nationally appropriate mitigation actions to be implemented by Parties not included in Annex I to the Convention (FCCC/AWGLCA/2011/INF.1), 18 March 2011.
[137] Bulmer et al, 2017, 60.
[138] Decision 1/CP.17, para 1.
[139] The U.S. and other states that form the Umbrella Group held this position. The U.S. insisted on a termination of the Long-term Cooperative Action process (LCA) in order o discontinue the use of "commitments" and "actions" to distinguish between developed and developing states' action. The removal of this so-call firewall was considered essential for the further development of the regime. *See*, Bulmer et al, 2017, 60; Rajamani, 2012, 505–6.
[140] Decision 1/CPM.7, para 1.
[141] Decision 1/CP.17, para 4.
[142] Bulmer et al, 2017, 61.
[143] Grubb, Michael, "Doha's Dawn?," Climate Policy 13, no. 3 (2013): 81.

approach that included nationally determined contributions as well as top-down elements to ensure ambition in mitigating climate change.[144] In fact, the COP decision taken in Warsaw on *Further Advancing the Durban Platform* achieved a high level of symmetry by inviting "all Parties to initiate or intensify domestic preparations for their intended nationally determined contributions … and communicate them well in advance of the twenty-first session of the Conference of the Parties."[145] In its 2014 Lima Call for Action, COP-20 reiterated this request by inviting "each Party to communicate to the secretariat its intended nationally determined contribution towards achieving the objective of the Convention"[146] that "will represent a progression beyond the current undertaking of that Party."[147] In addition, the Lima Call for Action dealt with information requirements concerning the intended nationally determined contributions.[148] Hence, it combined the bottom-up process of national contributions with a top-down element of oversight.

This overview illustrates how the notion of nationally determined contributions gradually emerged. This was only possible by deconstructing the KP's top-down architecture and, consequently, considering a new instrument under the UNFCCC. The piecemeal reconstruction of the UN climate regime's architecture was crucial for modifying substantive provisions on climate change mitigation. Yet, this shift was only possible after it emerged that the parties were willing to abandon the KP's bifurcated approach to differentiation. The next subsection analyses this interrelationship.

A review of COP decisions that were adopted during the period from 2005 to 2015 reveals that the negotiation process was not straightforward and did not lead to an all-encompassing and conclusive new agreement. The representation of salient issues eventually required several rounds of refinement and rephrasing during which some issues became politicised. No doubt, some provisions of the PA might also have to be updated and adjusted to ongoing technological and national regulatory developments in the future. Chapter seven will show that the strenuous negotiation process did not end after the adoption of the PA.

6.3.3. Reassessing mitigation and differentiation

After the previous two subsections described the need for and the evolution of renewed negotiation efforts after the KP's entry in force, this subsection discusses how the issues of mitigation and differentiation were reassessed in the course of negotiating the PA. This subsection specifically seeks

[144] Bulmer et al, 2017, 65.
[145] Further Advancing the Durban Platform, Decision 1/CP.19 (FCCC/CP/2013/10/Add.1), 31 March 2014, para 2 (b).
[146] Lima Call for Climate Action, Decision 1/CP.20 (FCCC/CP/2014/10/Add.1), 2 February 2015, para 9.
[147] Decision 1/CP.20, para 10.
[148] Ibid., para 14; *see* also Bulmer et al, 2017, 68.

to answer whether experiences from domestic climate and energy legislation contributed to the substantive reconstruction of the UN climate regime.

The adoption of the 2011 Durban Platform in particular re-contextualised the debate about both mitigation and differentiation. With respect to mitigation, it envisioned a process that should "raise the level of ambition"[149] and ensure "the highest possible mitigation efforts by all Parties,"[150] while it implicitly related the differentiation discourse to the notion of the CBDR principle as expressed in the UNFCCC. In fact, the Durban Platform does not explicitly mention the CBDR principle. It merely states that the negotiation process that it initiates should be conducted "under the Convention."[151] This means that the principles included in the UNFCCC were applicable to the negotiation process and relevant for its outcome.[152] Thus, at that time the parties refrained from introducing a new phrasing of the CBDR principle.[153] Only later a viable reformulation was agreed that would allow adherence to the principle on paper while permitting a considerable re-definition of the CBDR principle related to its operationalisation in the PA.[154]

When discussing the negotiation tracks, the previous subsection indicated that the parties – in parallel with their attempts to reverse the architecture of the UN climate regime – were reconsidering the design of mitigation actions. These efforts concerned a quantified long-term goal for climate action and broader participation in climate change mitigation. These two issues stood out and their resolution became important milestones in the history of the UN climate regime.

In 2009, the Copenhagen Accord had already added the goal of keeping global warming below 2˚C to the mitigation debate. By doing so, it translated the conclusions of the 2007 IPCC report[155] into a quantifiable threshold for global climate action. In combination with the Article 2 UNFCCC, which describes the objective of mitigation action, this goal helps to set "a bar against which the credibility of emission reduction commitments can be measured."[156]

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[149] Decision 1/CP.17, para 6.
[150] Ibid., para 7.
[151] Ibid., para 2.
[152] Bodansky, Daniel, "The Durban Platform Negotiations: Goals and Options," Harvard Project on Climate Agreements Viewpoints, July 2012, http://www.belfercenter.org/sites/default/files/files/publication/, pp. 2–3.
[153] Developed states were only willing to accept a reference to the CBDR principle if it included a qualification that would provide for an interpretation in the light of contemporary economic realities. Since the proposals on such a re-interpretation of the principle were rejected, no reference was made to the CBDR principle in the Durban Platform. *See*, Bodansky et al, 2017, 219–20.
[154] *See* sections 7.2. and 7.3. of chapter seven.
[155] In this report, the IPCC assessed the impact of climate change in the near and long term by running different scenarios. It then relates these scenarios to Article 2 UNFCCC and the objective of preventing "dangerous anthropogenic interference with the climate system." The report clarifies that any increase in average global temperature of more than 2 to 2.5°C above pre-industrial levels would exceed significant risks to many unique and threatened systems. To achieve lower stabilisation levels, it is crucial that ambitious mitigations efforts are made. The crucial timeframe is the first half of the 21st century. *See*, Intergovernmental Panel on Climate Change (IPCC), "Climate Change 2007: Synthesis Report," 2008, https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full _report.pdf, pp. 19, 48, 64–5, 73.
[156] Brunnée, Jutta, "From Bali to Copenhagen: Towards a Shared Vision for a Post-2012 Climate Regime?," *Maryland Journal of International Law* 25, no. 1 (2010): 92.

These moves were important to ensure the new agreement's "climate effectiveness"[157] – i.e. it should contribute to a considerable reduction of cumulative emissions over time.[158] To achieve this, the agreement needed to be stringent with respect to the commitments of the parties and score high on participation and compliance. Throughout the negotiations all three factors had to be considered adequately, which necessarily complicated the design of mitigation provisions and oversight requirements. In addition, stringency and participation had to be operationalised as dynamic variables. Given the cumulative nature of greenhouse gas emissions in the atmosphere, increasing stringency and/or participation over time should result in greater climate effectiveness in the long run, mainly because an evolutionary framework would lead to more effective action at a later moment in time.[159]

In addition, it is important how the process of climate change mitigation is imagined. To promote a long-term vision on climate action, the Copenhagen/Cancun juncture opened a conversation about the concept of decarbonisation at the international level. The Cancun Agreements present a "shared vision for long-term cooperative action" that include efforts "to work towards identifying a global goal for substantially reducing global emissions by 2050."[160] Most importantly, the Cancun Agreements realise "that addressing climate change requires a paradigm shift towards building a low-carbon society."[161] Thus, the parties acknowledge that a global transformation of the energetic basis of modern society is necessary to mitigate climate change.

The Cancun Agreements go on and suggest that the implementation of a "low-carbon development strategy" helps to achieve sustainable development.[162] Furthermore, "a low-carbon society" can offer "substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles."[163] The parties apparently already imagined a "new world" when they were drafting these lines. Accordingly, developed states should formulate "low-carbon development strategies or plans,"[164] while developing states are encouraged to do so "in the context of sustainable development."[165] To be true, the link was not made explicitly at that time. Yet, it goes without saying that pledges under the UN climate regime needed to reflect national low-carbon development

[157] Bodansky, 2012, 4.
[158] Ibid., 5.
[159] Ibid., 4–5.
[160] Decision 1/CP.16, para 5.
[161] Ibid., para 10.
[162] Ibid., para 6.
[163] Ibid., para 10.
[164] Ibid., para 45.
[165] Ibid., para 65.

strategies in order to be credible enough to make any meaningful assessment about global emissions trajectories. National policies would thus become benchmarks for pledges to reduce emissions at the international level.

The negotiations during COP-15 in Copenhagen made an important ideational contribution to the substantive restructuring of the UN climate regime's approach to mitigation. The political agreement by the majority of the parties on nationally determined pledges to climate action revealed a broad political basis among the states parties, including the EU, U.S. and China. Thus, most states parties would support a bottom-up approach to determining commitments to international climate action. National pledges became a viable option to reform the UN climate regime.

Furthermore, by introducing nationally determined pledges that would be part of international climate action, states necessarily had to reflect on their policies as potential starting points for internationally required substantive submissions. In this thought-process, the notion of "low-carbon development strategy" that the Cancun Agreements alluded to was readily connected with all measures that were adopted in the context of the low-carbon energy transition.

By 2010, as chapter five showed, many developed and developing states had already passed legislation to support renewables in the electricity sector; and some had determined a carbon price and created a carbon trading scheme. Thus, by that time it was possible to link the task of mitigating climate change with domestic efforts to decarbonise the generation of energy. As soon as this ideational link had been made, the thought and legislative processes at the domestic and international levels began to communicate. Myriads of domestic low-carbon developments became an integral part of the substantive discourse on mitigation under the UN climate regime. This permitted a substantive alignment of the UN climate regime that had been impossible under the KP.

As already mentioned, the path to a structural reform of the UN climate regime was closely related to the differentiation debate. For meaningful climate action, it was crucial to broaden the participation of states parties. This concerns the second major contribution that the 2011 Durban Platform made to the development of the UN climate regime: The negotiation process continued the Copenhagen/Cancun approach of relying on submissions from *all* parties to enhance global mitigation action. In accordance with their national situation and policies, all parties should accept or propose mitigation actions. The notion of "action by all" points to the ever more symmetrical phrasing of the provisions in successive COP decisions that address developed states and those that concern developing states. In fact, by calling for a new instrument "applicable to all Parties"[166] the

[166] Decision 1/CP.17, para 2.

Durban Platform reiterates the common concern to prevent dangerous climate change that the UNFCCC embodies. Under the UNFCCC *all* parties have general commitments to mitigate climate change.[167]

Until then, the so-called "firewall"[168] between Annex I and non-Annex I states had prevented states from dealing with climate change as a common concern. On the path to more symmetry, the framing of the process on Long-term Cooperative Action under the AWG-LCA negotiation track formed a final obstacle. Developed states, especially the U.S., were convinced that the Bali Action Plan had re-installed the "firewall," as it referred to developed states' "measurable, reportable and verifiable nationally appropriate mitigation commitments or actions"[169] and developing states' "nationally appropriate mitigation actions."[170] When the 2011 Durban Platform ended this negotiation process, it freed the debate from the firewall and allowed for a new process that most likely ruled out far-reaching interpretations of differentiation.[171]

Furthermore, a key contribution to the re-interpretation of differentiation under a new agreement resulted from a bilateral political consensus between the U.S. and China. Both states were arguably at the extremes of the debate. In November 2014, ahead of COP-20 in Lima, U.S. President Barrack H. Obama and his Chinese counterpart Xi Jinping issued a joint announcement[172] about both states' approach to global climate politics. This statement also mentions the CBDR principle and adds the qualifier "in light of different national circumstances."[173] This re-phrasing of the CBDR principle subsequently entered the Lima Call for Climate Action, as the phrase "in light of different national circumstances" was inserted into a provision on how the CBDR principle would frame the work process on the future agreement.[174] The formulation is also included in the provision that stipulates how the intended nationally determined contributions should be communicated.[175]

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[167] Article 4 (1) (b) UNFCCC; *see* also, Depledge, Joanna, "Foundations for the Paris Agreement: The Legal and Policy Framework of the United Nations Climate Change Regime," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle (Oxford: Oxford University Press, 2017), 30.

[168] Joanna Depledge points to the fact that in legal terms the distinction between both categories was never meant to be as rigid as it later emerged and the boundary was not intended to be impassable. Both aspects of the annex-based approach were politicised and created a bifurcation in the regime. *See* in detail, Depledge, 2017, 31–2.

[169] Decision 1/CP.13, para 1 (b) (I).

[170] Ibid., para 1 (b) (II).

[171] Rajamani, Lavanya, "The Durban Platform for Enhanced Action and the Future of the Climate Regime," *International and Comparative Law Quarterly* 61, no. 2 (2012): 505–6.

[172] The White House – President Barack Obama, "U.S.-China Join Announcement on Climate Change," 12 November 2014, https://obamawhitehouse.archives.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change; "中美发布应对气候变化联合声明" [China and the U.S. publish a joint announcement on the climate change action], 12 November 2014, http://politics.people.com.cn/n/2014/1112/c70731-26010508.html.

[173] "U.S.-China Join Announcement on Climate Change," para 2.

[174] Decision 1/CP.20, para 3.

[175] Ibid., para 14.

The adjustments to mitigation actions and differentiation were interlinked and reinforced each other. In terms of mitigation action, both the Warsaw Decision with its call to all parties to submit their intended nationally determined contributions and the Lima Call for Climate Action, which specified information requirements, had direct, substantive links with the PA. The ideational linkage between international climate action and domestic policies was opened by the imagination of a "low-carbon society" during the COP in Cancun. The shift towards the instrument of nationally determined contributions at the Warsaw COP enabled a reconsideration of the CBDR principle, without the pressure to necessarily finalise a reformulation. This consensus subsequently emerged from bilateral efforts by the U.S. and China and was reflected in the 2014 Lima Call for Climate Action. The phrase was also part of a joint statement[176] that the EU and China issued in June 2015. In this sense, two vital matters – the structure of mitigation action and the framing of differentiation – that had hampered the annual COPs for years were already taken into consideration and to a large degree agreed upon by major parties well before the Paris COP in 2015. Hence, after removing big structural obstacles the parties were able to think about making progress towards substantive matters. The next section summarises the outcome of this process by discussing the main characteristics of the PA, such as its architecture, operationalisation of differentiation, and adjusted approach to mitigation.

6.4. Paris Agreement

The PA was adopted on 12 December 2015 and entered into force on 4 November 2016. It is the third legally binding treaty in the history of the UN climate regime.[177] The obligations that are stipulated in the PA constitute a complex mix of mandatory and voluntary provisions.[178] Most importantly, the PA contains binding obligations of conduct with respect to mitigation action[179] and a system of oversight that consists of several elements, such as a transparency framework,[180] technical expert reviews of each party,[181] and a global stocktake.[182] This section discusses three aspects of the PA that are particularly relevant for the this dissertation. The following subsection

[176] "EU-China Joint Statement on Climate Change," 29 June 2015, http://www.consilium.europa.eu/media/23733/150629-eu-china-climate-statement-doc.pdf, para 5.
[177] Bodansky et al, 2017, 73; *see* on the legal character of the Paris Agreement, Bodansky, Daniel, "The Legal Character of the Paris Agreement," *Review of European Community and International Environmental Law* 25, no. 2 (2016): 150.
[178] Bodansky, 2016, 150; Dimitrov, Radoslav S., "The Paris Agreement on Climate Change: Behind Closed Doors," *Global Environmental Politics* 16, no. 3 (2016): 8.
[179] Rajamani, Lavanya, "Ambition and Differentiation in the 2015 Paris Agreement: Interpretative Possibilities and Underlying Politics," *International and Comparative Law Quarterly* 65, no. 2 (2016): 494; Winkler, Harald, "Mitigation (Article 4)," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 141.
[180] Article 13 PA.
[181] Article 13 (11), (12) PA.
[182] Article 14 PA.

6.4.1. focuses on the PA's architecture and objective. Then, subsection 6.4.2. considers the PA's approach to differentiation. Finally, subsection 6.4.3. discusses how the PA regulates the parties' mitigation action. Building on sections 6.2. and 6.3., the analysis in this section explores how the PA reflects the experiences of the Kyoto period and assesses the substantive evolution of the UN climate regime.

6.4.1. Architecture and objective

After the KP's entry into force, its architecture shaped international climate cooperation under the UN climate regime. The KP deployed a bifurcated approach to the commitments of the parties, based on the annexes of the UNFCCC. For many developed states, ending the rigid differentiation that resulted from the dichotomy between Annex I and non-Annex I parties was one of the foremost aims during the negotiations about a new legal instrument. The 2013 Warsaw Decision[183] already hinted at a hybrid structure – i.e. the combination of bottom-up and top-down regulation of international climate action. The Warsaw Decision called for the submission of intended nationally determined contributions that described the parties' mitigation actions.[184] Subsequently, the experiences with climate cooperation under the KP and the input of the parties during the negotiations under the AWG-ADP negotiation track, as one of the results of the Durban COP, inserted a complex hybrid structure[185] in the PA.

With its hybridity the PA, finds itself between the KP and the structure that the Copenhagen/Cancun approach had proposed.[186] Bodansky et al explain further that by pursuing the Copenhagen/Cancun approach, the regime would have entirely relied on a bottom-up determination of the parties' contributions. This approach would (at least initially) focus on broad participation and disregard rigid provisions on oversight and compliance, while the commitment of the parties might deepen at a later point in time. In contrast, the drafters of the KP had tried to achieve depth of commitments first, by deploying rigid timetables and emissions reduction targets over a short commitment period. Under such a regime, commitments are negotiated and imposed on the parties in a top-down way. However, when participation shrank the need for adjustment became undeniable.[187]

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[183] Decision 1/CP.19.
[184] Bodansky, Daniel, "The Paris Climate Change Agreement: A New Hope?," *American Journal of International Law* 110, no. 2 (2016): 293.
[185] Ibid., 2016, 301; Rajamani, 2016, 502; Dimitrov, 2016, 2.
[186] Bodansky et al, 2017, 26.
[187] Ibid.

Eventually, the negotiators of the PA opted for provisions that ensure broad participation[188] and at the same time included provisions on oversight and compliance.[189] Thus, the PA combines a bottom-up architecture with top-down elements that promote ambition and accountability.[190] In addition, the PA regulates long-term climate change cooperation by facilitating a certain progression of contributions by the parties. Instead of continuing the enforcement-oriented approach on which the KP relied, the PA introduces a managerial model into the UN climate regime.[191] By adjusting the regime's architecture, the PA reframes international climate cooperation under the UN climate regime and leaves the parties room for manoeuvre.

Following the departure from the Kyoto approach, the PA reinforces the UNFCCC's role in the UN climate regime. The PA has a firm relationship with the Convention and its objective.[192] Generally, the PA intends to effectuate the objective of the UNFCCC in dealing with the threat of global climate change.[193] Article 2 (1) PA stipulates that the agreement aims to enhance "the implementation of the Convention, including its objective." This article also specifies the PA's aspiration in terms of a quantified temperature target, adaptation capacity, and finance flows to promote a climate conscious development.[194] The PA seeks to "strengthen the global response to the threat of climate change."[195] The need to achieve sustainable development and eradicate poverty contextualises these efforts.[196] Thus, international climate cooperation under the PA is designed to be a rather comprehensive effort. This is evident in both the integral approach to national measures and the international oversight tools. It is amplified by the definition of the objective of the PA and its elements.

As part of its objective, the PA envisions a temperature limit – "well below 2˚C above pre-industrial levels" – that "would significantly reduce the risks and impacts of climate change."[197] By reading Article 2 (1) (a) PA together with Article 4 (1) PA, two additional, more long-term goals with respect to the global emissions development path become clear – i.e. achieving a global peaking of

[188] In its opening recital, the Durban Platform that initiated the ADP negotiation process had called for "the widest possible cooperation by all countries and their participation in an effective and appropriate international response." *See*, Decision 1/CP.17.
[189] Articles 13 and 15 PA establish a transparency framework and a compliance mechanism, respectively.
[190] Bodansky, 2016a, 301.
[191] Ibid., 296; Bodansky et al, 2017, 26.
[192] Bodansky et al, 2017, 221.
[193] *See* for a substantive analysis of Article 2 PA, Thorgeirsson, Halldor, "Objective (Article 2.1)," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 127–8; reference at Thorgeirsson, 2017, 123.
[194] Thorgeirsson, 2017, 127–8.
[195] Article 2 (1) PA.
[196] Article 2 (1) PA.
[197] Article 2 (1) (a) PA.

greenhouse gas emissions "as soon as possible" and balancing anthropogenic emissions and removals by sinks by 2050.[198]

Moreover, Article 2 (1) (b) PA calls for "increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience" and draws attention to the issue of "a low greenhouse gas emission development" that does not threaten global food production. Article 7 PA specifies the nature of adaptation actions[199] and their governance dimensions[200] and states that adaptation action is "country-driven,"[201] while support and international cooperation remains part of global climate action.[202]

Finally, Article 2 (1) (c) PA concerns financial aspects of "a pathway towards low greenhouse gas emissions and climate-resilient development." Article 9 PA, in conjunction with this provision, lists the parties' tasks with respect to climate finance. Developed states will provide financial resources to developing states and deploy these resources while taking into account "country-driven strategies" to balance adaptation and mitigation as well as "the priorities and needs of developing country Parties."[203] This is an additional element of climate cooperation that centres around policies and long-term strategies. Thus, the conversation between developed and developing states about climate change mitigation can move away from limited projects and certified emissions reductions to more comprehensive activities that help to realise transition plans. This might lead to regular exchange and cooperation to achieve long-term goals, both with respect to national strategies and the global pathway to a low-emission future.

Being "a central part of the Paris Agreement,"[204] the provisions on climate change mitigation are indeed key to the implementation of the PA's objective. The PA follows an innovative approach. Pursuant to Article 3 PA, all parties have to submit and undertake NDCs. The NDCs constitute the primary tool with respect to the global mitigation effort. Following the principle of non-regression or even progression,[205] the NDCs need to evolve over time. Article 4 (3) PA states that a party's successive NDCs would "represent a progression beyond the Party's then current nationally contributions and reflect its highest possible ambition."

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[198] Thorgeirsson, 2017, 127.
[199] Article 7 (1) PA.
[200] Article 7 (2) PA.
[201] Article 7 (5) PA.
[202] Article 7 (6) PA.
[203] Article 9 (4) PA.
[204] Winkler, Harald, "Mitigation (Article 4)," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 141.
[205] Grubb, Michael, "From Lima to Paris, Part 1: The Lima Hangover," *Climate Policy* 15, no. 3 (2015): 299; Boisson de Chazournes, Laurence, "One Swallow Does Not a Summer Make, But Might the Paris Agreement on Climate Change a Better Future Create?," *The European Journal of International Law* 27, no. 2 (2016): 254.

Since they derive from submissions by the parties, the NDCs are the PA's most notable bottom-up feature. Yet, making good on the hybridity of its approach the PA also includes in Article 13 PA provisions on a transparency framework.[206] The transparency framework might eventually facilitate exchange and debate among the states parties and ensure more ambitious climate action over time.

Pursuant to Article 4 (2) PA, the parties have to "prepare, communicate and maintain successive nationally determined contributions that it intends to achieve" and "pursue domestic mitigation measures." These actions are binding obligations of the parties. However, the outcomes of domestic policies that are implemented to mitigate climate change are beyond the scope of these obligations. The binding obligations solely concern the parties' actions or conduct.[207]

It is important to keep this in mind when considering further elements of oversight that the PA contains, such as the global stocktake and its compliance mechanism. To assess the compliance of the individual parties with their obligations, Article 15 PA establishes a new "mechanism."[208] Pursuant to Article 15 (2) PA, a committee of experts examines in a "transparent, non-adversarial and non-punitive" manner the compliance of the parties with their obligations. Given the distinct structures of the KP and the PA, the designs of compliance clauses under both treaties differ greatly. Under the PA, compliance relates to the way in which parties implement policies and measures, while the assessment under the KP considered the committed emissions reduction targets of the KP.[209] It remains to be seen how the debate among the parties will take shape with respect to the implementation of their NDCs and the progress made. In any case, much will depend on the modalities to implement the PA.[210]

Tracking the parties' progress will definitely be difficult. The above-mentioned Article 13 PA envisions a transparency framework that applies to all parties.[211] One function of the transparency framework is "to inform the global stocktake under Article 14."[212] It is noteworthy that paragraph 5 of Article 13 PA links the work under the transparency framework to both the global stocktake and Article 2 UNFCCC. This reference elevates the transparency framework to a central component of the

[206] The transparency framework will be applicable to all parties. However, it provides for built-in flexibility for states that encounter difficulties due to certain circumstances and a lack of capabilities, which will be discussed in section 7.3. of chapter seven. *See* also, Dagnet, Yamide, and Kelly Levin, "Transparency (Article 13)," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 301–18.
[207] Rajamani, 2016, 497–8.
[208] Article 15 (1) PA.
[209] Dagnet, Yamide, and Eliza Northrop, "Facilitating Implementation and Promoting Compliance (Article 15)," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 349.
[210] Chapter seven will discuss the guidelines regarding mitigation in detail and include the decisions of the Katowice Rulebook in the legal analysis of the PA.
[211] Article 13 (1) and (2) PA; *see* also Article 13 (13) PA.
[212] Article 13 (5) PA.

PA.[213] It strengthens transparency arrangements under the UNFCCC and enables meaningful data collection, an essential prerequisite for the global stocktake.[214] The transparency framework is vital for evaluating the progression of NDCs.

In this regard, the global stocktake, pursuant to Article 14 PA, is the most significant top-down complement to the NDCs.[215] Through the global stocktake's periodic reviews, the performance of the parties' climate actions is assessed. The outcomes are then considered in relation to the NDCs and the PA's objective. Yet, it is significant to keep in mind that this process concerns "the collective progress towards the purpose" of the PA and the long-terms goals it seeks to achieve.[216] The global stocktake will take place for the first time in 2023 and afterwards every five years.[217] Together with the transparency framework that examines the development of the NDCs and the parties' emissions, its conclusions will frame the global conversation about future action and subsequent efforts that have to be made in order to increase the level of mitigation, adaptation, and support action.[218]

Last but not least, there is another dimension to the PA structure that is distinct from the Kyoto period – i.e. the so-called Durban Pillars. These pillars concern the elements of climate cooperation that the PA seeks to regulate. They include mitigation, adaptation, finance, technology development and transfer, transparency of action, and capacity-building.[219] This pillar structure of international climate action is particularly important for the operationalisation of differentiation under the PA.[220] The next subsection explains how the PA reconsiders the role of the CBDR principle, which had been one of the most contentious issues of the UN climate regime since the adoption of the Berlin Mandate in 1995.

To sum up, the PA is an important advance compared to the KP, mainly because it formalises the bottom-up features that were first suggested by the Copenhagen/Cancun approach to climate action.[221] It provides the parties considerable room for manoeuvre, by allowing them to determine appropriate measures and the nature of climate action. Indeed, chapter five has shown that mitigation action emerges at the national level where frequent adjustments to climate and energy policies need to be made. The importance of this deviation from the previous approach will be

[213] Dagnet and Levin, 2017, 308.
[214] Ibid., 305, 317–8.
[215] Higham, Andrew, "Epilogue: Making the Transition from an International Agreement to a New Epoch of Human Prosperity in One Generation," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 416; *see* also subsection 6.4.3.
[216] Article 19 (1) PA.
[217] Article 19 (2) PA.
[218] Friedrich, Jürgen, "Global Stocktake (Article 14)," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 322–3.
[219] Decision 1/CP.17, para 5.
[220] Rajamani, 2016, 509–13.
[221] Bodansky, 2017, 316.

further elaborated in section 6.5. The PA's oversight and review tools[222] can facilitate a global conversation about long-term policies, in order to promote global decarbonisation or – as the PA labels this transition – "low greenhouse gas emissions development."[223]

6.4.2. Differentiation

In the PA, the CBDR principle is rephrased following a the formulation that originated from a joint statement by the presidents of the United States and China.[224] The principle now reads: common but differentiated responsibilities and respective capabilities, in the light of different national circumstances. This phrasing is included in the third preambular paragraph of the PA. It is also mentioned in Article 2 (2) PA that includes the objective of the agreement, in Article 4 (3) PA, which stipulates that nationally determined contributions should represent a progression, and in Article 4 (19) PA that concerns the parties' long-term low greenhouse gas emissions development (decarbonisation) strategies.

During the negotiation of the PA, the application of the CBDR principle was one of the most prominent issues.[225] The new agreement had to address the issue of differentiation, while taking into account the concerns about rising emissions in emerging economies and the burden of least developed states. A revision was inevitable. Daniel Bodansky explains that at some point the UNFCCC annex structure was no longer feasible as a basis for the application of the CBDR principle, mainly because it became ever more disconnected from reality, following rapid global economic growth in several large developing states.[226] Eventually, the PA completed the move away from the KP's categorical approach to differentiation. In the PA, no reference is made to the annex-based categories. The PA thus takes "a more particularized approach" that reflects the CBDR principle differently in its different elements.[227]

This points to the so-called Durban pillars[228] that were already mentioned in the previous subsection. Under the PA, differentiation is tailored to the specificities of each aspect of climate action – mitigation, adaptation, technology development and transfer, transparency of action, and capacity-building. Thus, the PA accords different forms of differentiation to these "pillars" of climate

[222] These oversight and review tools will be discussed in section 7.3. of chapter seven.
[223] *See* Article 2 (b) and (c) PA.
[224] *See* subsection 6.3.3.
[225] Section 7.2. of chapter seven traces the CBDR principle's evolution in the UN climate regime.
[226] Bodanksy, 2016a, 298.
[227] Ibid., 300.
[228] The Durban pillars concern regulation of mitigation, adaptation, technology development and transfer, transparency of action, and capacity-building.

action.[229] This form of operationalisation of the CBDR principle deviates considerably from the approach under the UNFCCC and KP. Accordingly, the CBDR principle contained in the PA is a distinct version of the principle.[230] Chapter seven will discuss the operationalisation of the CBDR principle with respect to different aspects of climate action in more detail.

In fact, the PA applies "a bounded self-differentiation model" to mitigation action.[231] The parties determine the scope of their contributions when they draft their NDCs, including the form and content of the information they want to make available about their climate measures. By doing so, the parties consider their national circumstances, capacities, and constraints. The outcome of this self-assessment differentiates the party in question from every other party.[232]

Generally, the clause "in the light of different national circumstances" shifts the interpretation of the CBDR principle, introducing a dynamic element to its interpretation. Still, it could be argued that the notion of "national circumstances" merely reiterates the element of "respective capabilities" that has been part of the principle since the adoption of the UNFCCC. Therefore, national determination would interpret and define the extent to which the CBDR principle is implemented and differentiates among the parties' contribution to global climate action.[233] This could suggest that the rephrasing of the CBDR principle, through the qualifier "in the light of different national circumstances" in connection with the NDCs, constructs a notion of nationally determined climate fairness under the PA.[234]

Yet, the NDCs also allow some form of social scrutiny, mainly because public claims of fairness become part of the global conversation about climate change mitigation. In the forum that the PA establishes not every self-assessment of fairness might be socially accepted.[235] Hence, differentiation in mitigation efforts seems to allow a more diverse and fluid support for the actions of developing states than under the KP.

However, it is vital that states undergo some form of scrutiny, especially when they submit follow-up NDCs that are required to convey a certain degree of progression in terms of their climate action and an acknowledgement of the CBDR principle. The implementation of the PA will show

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[229] Rajamani, Lavanya, and Emmanuel Guérin, "Central Concepts in the Paris Agreement and How They Evolved," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 84.
[230] Rajamani, 2016, 509; *see* in more detail the analysis of redefined CBDR principle in chapter seven.
[231] Rajamani, 2016, 509.
[232] Rajamani and Guérin, 2017, 84.
[233] Rajamani, 2016, 508; Rajamani, Lavanya, "Guiding Principles and General Obligation (Article 2.2 and Article 3)," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 134.
[234] Chan, Nicholas, "Climate Contributions and the Paris Agreement: Fairness and Equity in a Bottom-up Architecture," *Ethics and International Affairs* 30, no. 3 (2016): 294–5.
[235] Ibid., 298.

whether this scrutiny will be effectuated through the regular technical expert reports, debates during the global stocktake, or through public media attention.

In fact, Decision 4/CMA.1 requires that a party, when submitting their NDCs, explains how it "considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances."[236] The parties are also required to address the way in which their NDCs fulfil Articles 4 (3) and 4 (4) PA.[237] Articles 4 (3) PA stipulates the progression of the successive NDCs. The parties need to include a note on this issue; and they have to assess their NDCs in the context of the CBDR principle, which specifically refers to "national circumstances." The reference to Article 4 (4) PA requires developed states to describe how their NDCs ensure that they "continue to take the lead in economy-wide absolute emissions reduction targets," while developing states are expected to include an explanation how they "continue enhancing their mitigation efforts." It remains to be seen how substantive the states parties' explanations will be in this regard when they submit their next NDCs. Hence, the operationalisation of the CBDR principle in the context of mitigation action under the PA might, to a large degree, depend on how the parties interpret and apply the rules of the Katowice Rulebook, as chapter seven will discuss in further detail.[238]

6.4.3. Mitigation

Whereas in the past developed states were expected to take the lead in pursuing climate action,[239] climate change mitigation becomes a fully global process under the PA.[240] Yet, this approach does not absolve developed states from their particular responsibility. Article 4 (4) PA calls upon developed states to "continue to take the lead by undertaking economy-wide absolute emission reduction targets," while it encourages developing states to "move over time towards economic-wide emission reduction or limitation targets." This parallel wording reflects a perception of a common task and at the same time the paragraph allows for differentiation in time and related to national circumstances. The PA thus facilitates a broad participation in the global efforts to mitigate climate change.

Article 4 (2) PA also seeks to ensure broad participation and expects all parties to pursue "domestic mitigation action" in order to achieve the objective of the contributions that "[e]ach party shall prepare, communicate and maintain."[241] As already mentioned, the submission of NDCs are

[236] Paragraph 6 (a) of Annex I to Decision 4/CMA.1.
[237] Paragraph 6 (c) and (d) of Annex I to Decision 4/CMA.1.
[238] Section 7.3. considers the approach of the PA and the decisions of the Katowice Rulebook to differentiation.
[239] *See*, Articles 3 (1) and 4 (2) (a) UNFCCC.
[240] Grubb, 2015, 299.
[241] Article 4 (2) PA.

binding individual obligations of conduct.[242] Pursuant to Article 4 (9) PA, the parties have to submit their NDCs every five years. Their submissions will be retained in a public registry[243] with the secretariat of the Convention.[244]

Unlike the UNFCCC and KP, the PA includes a global temperature goal in the provisions that frame its attainment – i.e. keeping global warming below 2˚C above pre-industrial levels.[245] By alluding to "the long-term temperature goal set out in Article 2," Article 4 (1) PA contextualises the scope of the NDCs from a global environmental perspective. Placed in this context, the first paragraph of Article 4 PA sums up concrete mitigation actions that the parties undertake collectively – i.e. achieving a peaking of global emissions and then balancing anthropogenic emissions with removals by sinks. In fact, it outlines the parameters of achieving global carbon neutrality by adding as timeframe the second half of the 21st century. Additional parameters of this process are the concepts of equity and sustainability, and the aim of poverty eradication.[246]

The Katowice Rulebook re-emphasises this approach. Decision 4/CMA.1,[247] which details the rules regarding the information that has to be provided together with the NDCs, re-iterates the linkage between the objective of the PA and the parties' NDCs. When laying out further guidance for information, which the parties are required to provide concerning their NDCs, Decision 4/CMA.1 expects the parties to explain how the NDC "contributes towards achieving the objective of the Convention as set out in its Article 2"[248] and how the NDC takes into account Articles 2 (1) (a) and 4 (1) PA.[249] Thus, upon submission to the UNFCCC Secretariat the parties have to relate the substantive content of their NDCs to the need to stabilise greenhouse gas concentrations in the atmosphere, the goal of limiting global warming to 2˚C, the aim of having global greenhouse gas emissions peak as soon as possible, and the intention to achieve carbon neutrality after 2050.

Article 13 (7) (b) PA states that "each party" has to provide "information necessary to track progress made in implementing and achieving its nationally determined contribution under Article 4." Thus, this provision links the mitigation part of the NDCs to the oversight function of the transparency framework. Article 4 (3) PA applies the general clause on progression,[250] which NDCs have to express, to the parties' actions on mitigation. This paragraph does not seek to display an

[242] Rajamani, 2016, 497–8; Winkler, 2017, 141.
[243] *See*, NDC Registry (interim), http://www4.unfccc.int/ndcregistry/Pages/Home.aspx.
[244] Article 4 (12) PA.
[245] Article 2 PA.
[246] *See* also, Winkler, 2017, 144.
[247] Further Guidance in Relation to the Mitigation Section of Decision 1/CP.21, Decision 4/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019.
[248] Paragraph 7 (a) of Annex I to Decision 4/CMA.1.
[249] Paragraph 7 (b) of Annex I to Decision 4/CMA.1.
[250] *See* second sentence of Article 3 PA: "The efforts of all Parties will represent a progression over time, …".

unambiguous mandatory or recommendatory wording. However, the language of this provision conveys "a clear and strong expectation that parties will communicate successive NDCs that will progress beyond the current existing one, and be more ambitious."[251] This requirement is further contextualised by the inclusion of the rephrased CBDR principle in Article 4 (3) PA, which links the degree of progress of mitigation action to a party's national circumstances.

One could therefore conclude that assessing a party's "highest ambition" in the course of the transparency proceedings will be difficult, mainly because the rephrased CBDR principle involves this explicitly subjective element.[252] However, the public record that the NDCs will make available can help to put the parties' efforts into context, albeit from a historical perspective. Pursuant to Decision 5/CMA.1, the public registry of NDCs that includes all submissions by the parties[253] should also function as an archive – "as a matter of public record."[254] This can emerge as an important contribution to efforts to facilitate and inform the international conversation about progress and ambition of climate action.

Two other aspects related to mitigation action under the PA are noteworthy. They concern the establishment of the sustainable development mechanism (SDM) and the push for long-term low greenhouse gas emission development strategies.[255] The SDM may evoke the much criticised CDM. Article 6 (4) PA institutes an adjusted form of international mitigation cooperation. Participation in the SDM is voluntary and is governed by the UNFCCC, in the sense that the mechanism is under the authority of the meeting of parties to the PA (CMA). A body that is designated by the CMA will supervise the mechanism.[256]

The mechanism's aims are fourfold. First, it seeks to promote the reduction of greenhouse gas emissions.[257] Second, the mechanism creates a platform for public and private entities, which are authorised by a party, to allow them to participate in emissions reduction.[258] Third, mitigation action under the mechanism should decrease emission levels in the host state.[259] Finally, the joint efforts must result in an overall reduction of global emissions.[260]

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[251] Winkler, 2017, 148.
[252] Ibid.
[253] Article 4 (12) PA.
[254] Paragraph 4 of the Annex to Modalities and Procedures for the Operation and Use of a Public Registry Referred to in Article 4, paragraph 12, of the Paris Agreement, Decision 5/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019.
[255] *See*, Article 6 (4) PA and Article 4 (19) PA, respectively.
[256] Article 6 (4) PA.
[257] Article 6 (4) (a) PA.
[258] Article 6 (4) (b) PA.
[259] Article 6 (4) (c) PA.
[260] Article 6 (4) (d) PA.

The mechanism only refers to "mitigation action," which leaves the concrete organisation of the climate cooperation to the parties. Both developed and developing states can become host states for joint actions. Under the mechanism, specific scopes of activities can be created to address certain subsets of climate action differently, for instance diverging crediting for different economic sectors or special rules for cooperation in carbon capture and storage. Eventually, activities under the mechanism must collectively contribute to a higher level of emissions reduction that is offset through the joint activities. Thus, the mechanism only works if it achieves a net contribution to global efforts to reduce emissions.[261] In addition, the mechanism explicitly aims to "contribute to the mitigation of greenhouse gas emissions and support sustainable development."[262] Thus, the mechanism foregrounds environmental integrity and the overall objective of the PA. However, it is questionable whether these ambitious goals can be realised within a short period of time, given the fact the parties failed to agree on detailed rules for this mechanism during the first CMA in late 2018.

When the parties adopted the Katowice Rulebook in 2018 they did not include the guidelines for implementing the SDM. Decision 8/CMA.1[263] referred the draft to the Subsidiary Body for Scientific and Technological Advice (SBSTA) to elaborate the draft and present it to the subsequent COP/CMA in December 2019.[264] The drafts left many contentious issues open to political debate and decision during the COP-25/CMA-2. The SBSTA meeting in mid-2019 could not clarify the issue of environmental integrity. Doubts persisted as to whether markets can solve the emissions problem. Given the difficulties to agree on vital issues, it was uncertain whether guidelines for the implementation of the SDM would be adopted in December 2019.[265]

Eventually, the parties did not reach an agreement on the transfer of CDM credits from the Kyoto period and the way in which the rules for the SDM can both incentivise ambitious climate action and ensure the environmental integrity of the mechanism.[266] The delay in both the conceptualisation of the SDM and streamlining its design with the NDCs of the states parties renders the potential benefit of this new market mechanism under the PA negligible. Instead of setting up a mechanism that can provide some market signals for a short period of time, the parties might be better off using their creativity for planning long-term action.

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[261] Howard, Andrew, "Voluntary Cooperation (Article 6)," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 188–9.
[262] Article 6 (4) PA.
[263] Matters Relating to Article 6 Paris Agreement and Paragraphs 36 – 40 of Decision 1/CP.21, Decision 8/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019.
[264] Decision 8/CMA.1, para 3.
[265] IISD, "Summary of the Bonn Climate Change Conference: 17–27 June 2019," *Environmental Negotiations Bulletin* 12, no. 759 (2019): 16.
[266] Environmental Negotiations Bulletin (ENB), "Summary of the Chile/Madrid Climate Change Conference: 2–15 December 2019," Volume 12, Number 775, 18 December 2019, https://enb.iisd.org/download/pdf/enb12775e.pdf, p. 26.

Indeed, international climate cooperation will have to continue for decades to come. By encouraging parties to formulate long-term low-greenhouse gas emissions development strategies,[267] the PA promotes comprehensive measures that aim to reduce emissions in the long run. In accordance with Decision 1/CP.21,[268] parties can submit their low-emission development strategies that they intend to implement until 2050. The secretariat publishes the submissions on its website.[269]

The submission and publication of these strategies are important steps to publicise global mitigation efforts for three reasons. First, they add a long-term perspective to the regularly registered NDCs. Thus, studying the long-term strategies can help to fine-tune investment decisions. Second, the strategies establish a crucial long-term link between development and climate action. Third, if a growing number (or even a majority) of the parties publishes long-term strategies, a better understanding can be achieved with respect to global emission pathways.[270]

Indeed, through the encouragement of global exchange about long-term mitigation efforts the PA acknowledges and continues the vital global conversation that brought about the bottom-up reversal of the UN climate regime. Domestic legislation and policies have become the building blocks of the UN climate regime. The PA realised a paradigm shift with respect to mitigation action. The next section explores the constraints that the shift towards a bottom-up structure imposes on international climate cooperation.

6.5. Keystone and limits of international climate cooperation

The reversal of the UN climate regime's approach to the regulation of states parties' commitments results in a bottom-up structure. In this structure, the parties, through their NDCs, determine the scope, nature, and duration of their climate action under the UN climate regime, albeit related to the objectives stipulated in Article 2 PA. This extensive room for manoeuvre needs to be balanced with instruments that can assure the parties that all participants honour their commitments. Thus, top-down instruments are vital to build trust and a sense of cooperation. This section argues that instruments, which provide essential information to decision makers are crucial top-down elements that are necessary to facilitate a meaningful reconstruction of the UN climate regime. The host of

[267] Article 4 (19) PA.
[268] Adoption of the Paris Agreement, Decision 1/CP.21 (FCCC/CP/2015/10/Add.1), 29 January 2016, para 35.
[269] *See*, United Nations Climate Change, "Communication of Long-term Strategies," http://unfccc.int/focus/long-term_strategies/items/9971.php.
[270] Winkler, 2017, 159–60.

information that is gathered through these instruments forms the keystone of the hybrid bottom-up structure that the PA established.

The PA includes three vital instruments that are designed to track the states parties' actions under the PA, either collectively or individually. These instruments are the global stocktake, transparency reports, and technical expert reviews. Article 14 PA regulates the global stocktake. Its rules are further detailed in the Decision 19/CMA.1 of the Katowice Rulebook. This tool evaluates the collective performance of the states parties. Furthermore, the transparency reports[271] and technical expert reviews[272] are part of the transparency framework. They help to regularly consider the situation of individual states parties. Taken together, the global stocktake and information about individual states parties should provide negotiators at the global level and decision makers in the domestic realm with facts and assessments that can help them to advance international climate cooperation.

Based on an agreement among the parties at COP-20 in Lima in 2014, the global stocktake only considers the collective performance in its regular assessments. This was decided in order to avoid that individual states parties would be put to shame. Nevertheless, reviews of individual parties that are part of the transparency framework are also intended to provide input to the global stocktake.[273] The global stocktake evaluates the "collective progress" with respect to mitigation, adaptation, and support that parties make available to others. The evaluation should proceed in a "comprehensive manner."[274] Obviously, the collective progress needs to take into account the assessment of the individual NDCs that are obtained through the transparency framework.[275]

The global stocktake has three functions. First, it assesses the implementation of the PA in the context of its objectives. Second, it evaluates the conclusion of this assessment from the perspective of where the parties should be at that particular stage in the implementation process. Third, pursuant to Article 14 (3) PA the global stocktake also advises the parties on how they can update and enhance their individual action and support to other parties. Furthermore, the global stocktake includes suggestions on how the parties can enhance their collective performance. Thus, pursuant to Article 14 (1) and (3) PA the global stocktake presents an assessment of past collective performance, an evaluation what the parties should have achieved by that time related to the objectives of the PA, and two recommendations – i.e. for improvements of individual parties' performance and for more

[271] Article 13 (7) PA.
[272] Article 13 (11) PA.
[273] Friedrich, 2017, 322.
[274] Article 14 (1) PA.
[275] Friedrich, 2017, 325.

ambitious collective action.[276] Needless to say, the quality of input is vital for fulfilling these functions.

Decision 1/CP.21 requested the first CMA to make recommendations concerning the information that the global stocktake gathers and establishes modalities for conducting the global stocktake.[277] Decision 19/CMA.1[278] sums up the "sources of input." In accordance with paragraph 35 of Decision 19/CMA.1, the input is provided to inform "thematic areas" that paragraph 6 (b) sets forth – i.e. mitigation, adaptation, and means of implementation and support. Information on these areas can include efforts that address social and economic consequences resulting from climate measures and efforts that avert, minimise, and address loss and damage caused by climate change.[279]

The information that will be considered "at a collective level" when conducting the global stocktake is listed in paragraph 36. The list includes the situation concerning greenhouse gas emissions,[280] the overall effect of parties' NDCs and overall progress that the parties made towards the implementation of their NDCs,[281] adaptation efforts,[282] finance flows,[283] educative activities,[284] barriers and challenges faced by developing states,[285] good practices and opportunities to enhance international cooperation,[286] and fairness considerations that the parties communicate in their NDCs.[287] The parties' contribution will necessarily be vital to obtain these pieces of information.

However, paragraph 37 sets forth that further sources are used as input for the global stocktake. These include reports and communications from the parties, IPCC reports, reports of the subsidiary bodies, reports from other bodies and forums that serve the PA and/or the UNFCCC, synthesis reports by the secretariat, reports from UN agencies and other international organisations, voluntary submissions from parties, reports from regional groups and institutions, and submissions from non-party stakeholders and UNFCCC observer organisations.[288] Accordingly, the global stocktake relies on an array of "internal" and broader documentation related to the three thematic areas. Subsequently, the parties have to take into account the outcomes of the global stocktake

[276] Ibid., 324.
[277] Decision 1/CP.21, paras 99 (a), 100..
[278] Matters Relating to Article 14 of the Paris Agreement and Paragraphs 99–101 of Decision 1/CP.21, Decision 19/CMA.1 (FCCC/PA/CMA/2018/3/Add.2), 19 March 2019.
[279] Ibid., para 6 (b).
[280] Ibid., para 36 (a).
[281] Ibid., para 36 (b).
[282] Ibid., para 36 (c).
[283] Ibid., para 36 (d).
[284] Ibid., para 36 (e).
[285] Ibid., para 36 (f).
[286] Ibid., para 36 (g).
[287] Ibid., para 36 (h).
[288] Ibid., para 37 (a) to (i).

when they prepare their next NDCs.[289] Decision 4/CMA.1 stipulates that they have to explain in their NDCs how the preparation of their NDCs was informed by the outcomes of the global stocktake.[290] Hence, these provisions clearly establish modes of communication between the domestic and international levels. It remains to be seen how far the parties will go in revealing their conclusions about the global stocktake with respect to their own future commitments.

Information on a states party's individual situation will be obtained through the transparency framework, as part of biennial transparency reports that include national inventory reports and technical expert reviews. Pursuant to Article 13 (5) PA, this information ought to "inform" the global stocktake. Decision 18/CMA.1[291] sets forth the modalities for the preparation of the inventory reports and technical expert review. The first national inventory report will have to be submitted by the end of 2024.[292] The secretariat produces synthesis reports of the parties' submissions.[293] The inventory reports also need to mention "information necessary to track progress made in implementing and achieving nationally determined contributions."[294] Yet, some parties might choose to approach these reporting requirements with some "flexibility" that Article 13 (2) PA grants "those developing country Parties that need it in light of their capacities." Thus, the first reports will show whether this form of relaxation might impede the flow and coherence of information.[295]

The technical expert reviews consider the "consistency of the information" submitted by the party[296] and the party's "implementation and achievement of its NDC."[297] It also identifies "areas of improvement."[298] A technical expert review will be made of the first biennial transparency report and subsequently of at least two biennial transparency reports in a 10-year period.[299] The party has to cooperate with the team of experts.[300] The reports will be published on the UNFCCC website.[301] Thus, the instruments of both the global stocktake and transparency framework have the potential to gather and assess a great amount of information that can give guidance for further decision making.

No doubt, the hybrid structure of top-down and bottom-up elements on which the PA relies needs this vital building block of data and analyses. It remains to be seen whether the information,

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[289] Article 4 (9) PA.
[290] Paragraph 4 (c) of Annex I to Decision 4/CMA.1
[291] Modalities, Procedures and Guidelines for the Transparency Framework for Action and Support Referred to in Article 13 of the Paris Agreement, Decision 18/CMA.1 (FCCC/PA/CMA/2018/3/Add.2), 19 March 2019.
[292] Ibid., para 3.
[293] Ibid., para 6 (a).
[294] *Cf*. ibid., paras 59–102.
[295] *See* section 7.3. of chapter seven for an in-depth assessment of the provision of flexibility in the context of the transparency framework.
[296] Decision 19/CMA.1, para 146 (a).
[297] Ibid., para 146 (b).
[298] Ibid., para 146 (d).
[299] Ibid., para 158 (a), (b).
[300] Ibid., para 165.
[301] Ibid., para 188.

which is obtained in the course of implementing the provisions of the PA and in particular the decisions included in the Katowice Rulebook, is sufficient for the purpose of cultivating fruitful international climate cooperation.

Arguably, in the context of climate change mitigation states parties' information about their emissions situation and domestic mitigation measures is more important than enforcing compliance with the binding obligation that the parties have under the PA. Information about ongoing mitigation action is important, mainly because the low-carbon transition constitutes a *governed* energy transition, as already mentioned in subsection 5.2.2. of chapter five. Thus, for the first time in history governments seek to accomplish the shift from one fuel to another through intervention, relying on legislation and long-term policies. Information is vital to define outcomes and methods of the governed transitions.

With the adoption of the PA, the UN climate regime functions as a global body that governs and coordinates low-carbon measures. Information is essential at all levels of decision making that intervene in this governed transition. At the international level, information is vital to assess the global progress, while at the domestic level information from other parties is beneficial for each party in order to be able to proceed with its own climate action. The reason for this is twofold. First, as subsection 5.4.1. of chapter five described, elements of low-carbon policies have spread across the globe through policy diffusion. The timely provision of information among the parties can accelerate this process.

Second, beyond the interest in innovative policies each party needs information about other parties' policy decisions that could possibly impact their domestic economic and low-carbon policies. In changing market environments, previously designed policies might have to be revised following choices that other parties have made. Information that helps alert the parties in question might be useful to accelerate needed policy adjustments. Hence, given the strong role of the government in the low-carbon transition, exchange of information is vital to enable governments to take meaningful decisions and enact appropriate policies.

The description of the beginning of decarbonisation in chapter five showed that to implement low-carbon measures in the electricity sector a range of government actions was necessary, including continued adjustments of climate and energy legislation. The decarbonisation of the remaining components of the energy sector – transport and heating – necessarily requires additional interventions. The outcomes of the governed energy transition will be unique for each state. The successive adoption and implementation of low-carbon measures as well as the public debate about

these government interventions to foster decarbonisation create domestic policy and societal realms that interact with each other. Thus, in each state a distinct low-carbon polity emerges. Policies might travel from one state to another as part of policy diffusion. However, these policies are re-negotiated and re-designed and, subsequently, communicated in an appropriate way, according to the situation of the low-carbon polity that seeks to adopt these policies.

The national specificity of the low-carbon transition puts a limit on international climate cooperation. For international lawyers, it is vital to acknowledge the interactional context in which the PA is being implemented. The fact, that the PA stipulates a bottom-up approach to the parties' mitigation commitments is a crucial characteristic of the PA's approach to regulating climate action. When considering further instruments to foster international climate action, one needs to give some thought to this structural change compared to the Kyoto approach. Some plans are most likely not suited for this hybrid architecture.

The desire to somehow revive a form of international trade in emissions reduction credits is a case in point. To further contemplate the idea of establishing an international emissions trading mechanism is disadvantageous for two reasons. First, the experiences of the CDM suggest that it is difficult to organise and administer such a mechanism in a way that is beneficial to the cause of international climate cooperation. Second, the mechanism would, through the market forces that it unleashes, link several national low-carbon polities. It would force national decision makers to constantly take into account developments at the international level. This projection is anathema to the bottom-up approach that the PA pursues.

The linking of emissions trading schemes clearly stretches international climate cooperation to the limit. Apart from the fact that none of the existing carbon markets was able to create a strong carbon price that could accelerate the shift to non-carbon fuels, international trading of "mitigation outcomes"[302] under the sustainable development mechanism (SDM) would to some degree interfere with the bottom-up mitigation action under the PA.

Indeed, in the current international political climate it is unlikely that a central body can manage this mechanism. Given the various and often unpredictable interactions of climate policies, states that chose to create and administer domestic carbon markets to advance the low-carbon transition benefit most if this market operates in isolation. Under these circumstances, governments are still able to intervene, set caps on total emissions, reduce allowances, and adjust prices.[303]

[302] Article 6 (2) PA.
[303] Green, Jessica F., "Don't Link Carbon Markets," *Nature* 543 (2017): 484–5.

Indeed, it is ill advised to embrace a "polycentricity" of climate governance[304] and establish international rules for its regulation, while at the same time linkages between "polycentric" entities are being contemplated. The various elements of decarbonisation, and in particular emissions trading schemes,[305] emphasise the multitude of approaches, times lines, and preferable energy futures.

The account of the reversal and conceptualisation of the hybrid approach that the PA establishes revealed that domestic legislation and policies were essential to communicate the concept of decarbonisation and the relevance of a composition of parties' contributions to international climate action based on their policies. The PA institutes a paradigm in which substantive action and information are prepared, realised, and communicated in a bottom-up manner. This paradigm was brought about by the reconstruction of the UN climate regime. Reversing parts of it, would disregard the wisdom that informed the reconstruction process. This finding confirms the first hypothesis of this dissertation.[306]

In this context, it is important to note that – although in the past some policy diffusion could be observed – it is unlikely that a convergence of national low-carbon policies will occur anytime soon. Rather, domestic decision makers need as much space as possible to address the fragility of the governed energy transition and societal preferences that frequently interact with decarbonisation measures. Hence, meaningful international climate cooperation relies on a shared long-term vision as well as room for manoeuvre to implement appropriate, nationally differentiated policies.

6.6. Concluding remarks

This chapter followed the decarbonisation storyline. It first considered how climate cooperation under the KP evolved. During the negotiation of the KP, the parties were unable to imagine the scope and nature of the efforts that would be necessary to mitigate climate change. When they started implementing the KP and engage with its mechanisms, it became obvious that the Kyoto approach would not institutionalise a meaningful form of international climate cooperation. National policy approaches to climate action suggested a different direction.

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[304] *See*, Jordan, Andrew, Dave Huitema, Harro van Asselt, and Johanna Forster, eds. *Governing Climate Change: Polycentricity in Action?* Cambridge: Cambridge University Press, 2018.

[305] Low-carbon policies that are unrelated to the emissions trading scheme might lower allowances prices and thus weaken the incentive structure that the scheme tries to communicate. This would complicate the linkages among individual emissions trading schemes from a polycentric perspective on carbon markets. *See*, Biedenkopf, Katja, and Jørgen Wettestad, "Harnessing the Market: Trading in Carbon Allowances," in *Governing Climate Change: Polycentricity in Action?*, ed. Andrew Jordan, Dave Huitema, Harro van Asselt, and Johanna Forster (Cambridge: Cambridge University Press, 2018), 241–2.

[306] First hypothesis: *A meaningful reconstruction of the UN climate regime relies on the input of national legislative and policy approaches*.

Indeed, ever more climate and energy laws and policies were adopted at the domestic level. They hinted at an emerging conceptualisation of the feasible mitigation action. By 2010, many states were implementing low-carbon measures. In that same year, the Cancun Agreements envisaged the shift towards a low-carbon society, introducing the concept of decarbonisation into the UN climate regime. From that moment onwards, the communication between the domestic and international levels about the modes of climate action became ever more intelligible. A path to climate action evolved, while the parties were deconstructing the Kyoto approach and emissions kept rising.

The increase in global emissions from 2005 to 2015 was remarkable and unprecedented. It was primarily caused by China's unrelenting dash for coal. This realisation threatened to have a sobering effect on international climate cooperation under the UN climate regime. Without broader participation, it seemed impossible to further contemplate the future structure of the regime. Eventually, the reconstruction resulted in the PA's bottom-up approach to the parties' mitigation commitments. The PA thus facilitates the participation of developing states through forms of differential treatment that apply to the components of climate action differently.

The dimension of time refers to the rapid increase of global CO_2 emissions during this period. Yet, it also emphasises that it took the states parties only ten years to reverse the Kyoto approach and adopt a new treaty that acknowledges the nature of mitigation action "on the ground." The response to the various flaws of the KP evolved gradually and eventually led to substantive innovations. The PA entails a process that structures international climate cooperation for years to come. It facilitates the regular exchange of information on national outcomes and the global emissions situation, which might evolve as a salient top-down element of the PA's hybrid architecture.

This leads to the dimension of imagination. With the regular gathering and review of various sources that evaluate the national and global emission and mitigation situation, the PA is able to create a platform that allows the parties to constantly update and reassess the imagination of energy futures and appropriate climate action. By doing so, the parties would be capable of responding much faster to weaknesses in the UN climate regime than in the past.

Furthermore, the PA approach is better suited to acknowledge the complexity of climate change mitigation and the diverse conditions that shape energy and climate policies across the globe. By taking into account the complexity of the evolving governed transitions and the distinct low-carbon polities that they create, the PA suggests limits to international climate cooperation. Thus, international lawyers need to be cognizant of the message that the bottom-up approach to

mitigation action communicates: Introducing further top-down elements would at least in part invalidate efforts to appreciate the contributions of national legislation and policies to the UN climate regime's evolution. To be sure, few states might express enthusiasm for another reconstruction, while many would be reluctant to let a volatile market mechanism spoil the evolution of their low-carbon polity.

OUTLINE – CHAPTER SEVEN

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CHAPTER SEVEN

Differentiation in a changing climate:

Climate cooperation after a cycle of norm contestation

7.1. Introductory remarks

The CBDR principle greatly influenced the legal and institutional evolution of the UN climate regime. Since the adoption of the UNFCCC, it has been determining how the parties organise and experience cooperation under the regime. No doubt, during the first two decades of the UN climate regime the CBDR principle's operationalisation was the primary source of contention.[1] The debate during the negotiations of a post-Kyoto instrument centred upon a more appropriate differentiation of emissions reduction commitments.

In the mid-1990s, the adoption of the Berlin Mandate had cemented an interpretation of the CBDR principle that for the time being exempted developing states from any binding emissions reduction commitments. Through the KP, the Berlin Mandate's interpretation of the CBDR principle guided the implementation of the principle and was the basis of climate cooperation under the UN climate regime from 2005 onwards.[2] This interpretation became the point of departure for further negotiations about the future of the UN climate regime.

Widespread discontent over the operationalisation of the CBDR principle in the KP gradually resulted in a reconsideration of differentiation within the UN climate regime. Chapter six showed that attempts to reassess the application of the CBDR principle were vital for the success of the climate change negotiations. Together with the tool of nationally determined contributions to global

[1] *See* chapter four for an overview of the developments during the period until 2005.
[2] *See* chapters three and six.

mitigation efforts under the PA, the refined CBDR principle helped adjust the previous approach of the UN climate regime.

The PA's operationalisation of the CBDR principle remains within the boundaries of the UNFCCC, but introduces vital changes. Article 4 (3) PA reiterates the formulation of Article 3 (1) UNFCCC and links efforts to protect the climate to "common but differentiated responsibilities and respective capabilities." In addition, the rephrased CBDR principle states that differentiated contributions should be gauged "in the light of different national circumstances."[3] This qualifier is an important refinement. It links national and international levels of rulemaking. Indeed, the CBDR principle guides the design of NDCs and the pursuit of domestic decarbonisation strategies as well as the implementation of the PA with respect to international climate cooperation.[4] Another important adjustment is the varying operationalisation of the CBDR principle in different fields of climate cooperation under the PA, such as mitigation, adaptation, finance, technology, capacity-building, and transparency.[5]

This chapter sheds a light on the evolution of the CBDR principle in the UN climate regime during the period from 2005 to 2015. In order to evaluate the significance of these modifications, the chapter deploys three perspectives. First, it assesses how the interpretation of the principle evolved following a *cycle of normative change*. This assessment relies on constructivist norm scholarship and discourse analysis.[6] Second, this chapter discusses how the refinement of the CBDR principle advances the *legality of the UN climate regime*. This analysis is inspired by the account on the interactional characteristics of international law that Jutta Brunnée and Stephen J. Toope have developed.[7] Third, the chapter relates the provisions of the PA and the refined CBDR principle to concepts that scholars developed in international environmental law and in social science research on social issues that are shaped by climate change and the energy transition. By doing so, a *triangular framework for climate cooperation* emerges. Its visualisation highlights vital components of climate cooperation under the PA. These components are the precautionary concept as well as the concepts of climate justice and resilience and energy justice and security. They resonate with the

[3] Article 4 (3) PA.
[4] See Articles 2 (2), 4 (3), and 4 (19) PA, respectively.
[5] See also section 7.2. of this chapter.
[6] *Cf*. the introduction of norm research in chapter two (2.4.2) and its application to the CBDR principle, including a summary of why the combination with a discursive approach is useful to examine the principle's evolution, in chapter four (4.4.1.).
[7] *Cf*. the introduction to Brunnée and Toope's theoretical approach and its application to the UN climate regime in chapters two (2.4.2.) and four (4.4.1.).

challenges that both the consequences of climate change and the low-carbon transition present,[8] especially regarding the position of vulnerable groups.[9]

The triangular framework illustrates the intricacies of the tasks that the PA seeks to regulate. It accentuates the linkages between international and national components of climate cooperation. By doing so, it visualises the answer to the second part of this study's research question that brings together the storylines of differentiation and decarbonisation in this chapter:

> *How did experiences from domestic climate and energy legislation contribute to a substantive bottom-up reconstruction of the UN climate regime;* ***and how does this reconstruction relate to the CBDR principle****?*

Furthermore, by assessing the CBDR principles evolution and its legality in the PA as well as by presenting the triangular framework of climate cooperation this chapter also answers the two remaining sub-questions that guided this research project. They concern both the legality and substance of the UN climate regime:

> 4. *Can the bottom-up reconstruction of the UN climate regime help fulfil Fuller's criteria of* ***legality****, as applied to international law by Brunnée and Toope?*
> 5. *Can a redefined CBDR principle in a reconstructed UN climate regime provide* ***meaningful differentiation*** *and (continue to) function as a principle of* ***good global environmental governance****?*

This chapter argues that the bottom-up approach to climate change mitigation is intrinsically linked with the refined interpretation of the CBDR principle. Without reconsidering the CBDR principle's interpretation, the bottom-up approach to mitigation commitments would have been impossible. The same is true for the re-conceptualisation of international climate cooperation under the UN climate regime.

The analysis is structured as follows. The next section considers the evolution of the CBDR principle as a cycle of normative change and tracks its journey from facilitating a rigid form of

[8] *See* the examples that subsection 1.1.1 of chapter one describes.
[9] *See*, for instance, how the Saami reindeer herders in Norway are affected by both climate change and the low-carbon transition, as summarised in textbox 2.1 in subsection 2.2.3. of chapter two.

differentiation among states parties under the KP to the adoption of the PA and its novel approach to differentiation. Section three studies the refined CBDR principle's contribution to the legality of the UN climate regime and the regime's reconciliation with general tenets of international environmental law. Section four describes the components of climate cooperation – precautionary concept, climate justice and resilience, and energy justice and security – that emerge from the provisions of the PA and visualises their interrelationship. Section five concludes.

7.2. Redefining differentiation

This section recounts the refinement that the CBDR principle underwent during the negotiation process until 2015. By doing so, it explores the stages of normative change in the principle's evolution that accompanied the bottom-up reconstruction of the UN climate regime. The first subsection chooses a discursive approach and focuses on textual and interpretative matters. Based on this overview, the second subsection presents the refinement of the CBDR principle in the UN climate regime as a cycle of normative change. The brief evaluation of this process relies on concepts that IR scholars contributed to constructivist research on norm development or norm contestation. This research approach was introduced in chapter two (*see* subsection 2.4.2) as part of the theoretical framework that this dissertation deploys as well as in chapter four (*see* subsection 4.4.1.) that highlighted the benefits of applying this approach to the CBDR principle in the UN climate regime and set the stage for further analysing the principle's evolution in this regime.[10]

To illustrate this process, this section includes two figures. They visualise the relation between the principle's evolution and the three landmark treaties and COP decisions that mark the main stages of the UN climate regime's normative development. The first figure 7.1 follows the principle's *reformulation* based on the textual evidence in the treaties and COP decisions, while the second figure 7.2 uses Sandholtz's model of normative change and applies it to the principle's evolution. This exercise helps to explain how a *new equilibrium* was achieved between the shared understanding among parties regarding differentiation and the interpretation of the CBDR principle in the UN

[10] *See* for an overview of research on norms development and contestation, Rosert, Elvira, "Fest etabliert und weiterhin lebendig: Normenforschung in den Internationalen Beziehungen" [Established and alive: Norm research in International Relation], *Zeitschrift für Politikwissenschaft* 22, no. 4 (2012): 599–623; Deitelhoff, Nicole, and Lisbeth Zimmermann, "Things We Lost in the Fire: How Different Types of Contestation Affect the Validity of International Norms," PRIF Working Paper, no. 18, December 2013, https://www.ssoar.info/ssoar/bitstream/handle/document/45520/ssoar-2013-deitelhoff_et_al-Things_we_lost_in_the.pdf, pp. 1–17; Wiener, Antje, "Enacting Meaning-in-use: Qualitative Research on Norms and International Relations," *Review of International Studies* 35, no. 1 (2009): 175–93; Wiener, Antje, *A Theory of Contestation*. Heidelberg: Springer, 2012.

climate regime. Both figures imagine this instance of norm contestation as a cycle[11] to illustrate processes of normative change. The textual examination that this subsection presents and the visualisation of the path to a new equilibrium reveal the close relationship between the CBDR principle's evolution and the gradual reconsideration of the approach to mitigation commitments that occurred prior to the adoption of the PA, which subsequent sections in this chapter will allude to again.

7.2.1. Reformulating the CBDR principle

During the negotiations at the annual conferences of the parties (COPs) that took place between 2005 and 2015, a refined interpretation of the CBDR principle gradually emerged that eventually resulted in a rephrasing of the principle in the text of the PA. This process was protracted and painful. The COP decisions, the outcomes of the annual rounds of negotiations, give an account of this hesitant adjustment.

From the outset, the CBDR principle was an important vehicle for introducing differential treatment to the UN climate regime.[12] The principle's normative influence concerns procedural matters as well as the design of commitments that the parties have under UN climate regime, either binding or not.

Chapter four described the situation prior to the adoption of the KP. Even before the parties agreed on the KP, the interpretation of the CBDR principle had become a matter of contention. The contestation of how the CBDR principle should be interpreted lasted two decades (from 1995 to 2015) and greatly influenced the development of the UN climate regime. The fact that one of the regime's vital concepts was fraught with discord severely hampered the regime's normative development. It took years to reconstruct this core principle and improve its operationalisation. Subsection 7.3.2. will show that the reformulation and operationalisation of the principle also had a significant effect on the legality of the UN climate regime.

[11] It is important to note that this is an analytical tool that explains normative developments in the past, but cannot help to *predict* normative change. *See*, Bailey, 2008, 323.

[12] *Cf*. for a historical background of the differential treatment in international environmental law and the specific circumstances under which the CBDR principle entered the UN climate regime the sections 4.2. and 4.3 in chapter four.

Arguably, the parties to the UN climate regime first required a shared understanding about the role of differentiation within the regime. Norms are socially constructed, as they derive from shared understandings. A shared understanding includes both the *need* for a norm to facilitate a certain action and its substantive *content*.[13] Thus, parties needed to agree that it was fair to have states at different levels of socio-economic development undertake different commitments under the regime and that all states would have some evolving commitments. Then, they could discuss how this reading of the principle applies to substantive rules.

Norms are "work in progress," as they are processes.[14] Indeed, as soon as a new norm is created and applied yet another process of contestation commences. Norms are contested by actors or interact with other norms in a given normative system. [15] For instance, the ratification of a treaty by the parties and its subsequent entry into force generally mark the end of the rulemaking process. At the same time, it is the beginning of a new phase in which the actors (parties) further contemplate both the subject matter and the newly established normative framework that has to guide international cooperation in this field of policymaking. This process is a follow-up to the creation of a normative framework during which the interpretation of norms and their operationalisation are constantly redefined and adjusted. Obviously, the intensity of the process varies, depending on the extent to which the initial norm or its interpretation is (or becomes) contentious. Therefore, proper rule application by the parties, arguments over rules and actions as well as inaction in the context of a normative framework generally trigger (further) normative change and develop the regime in question further.

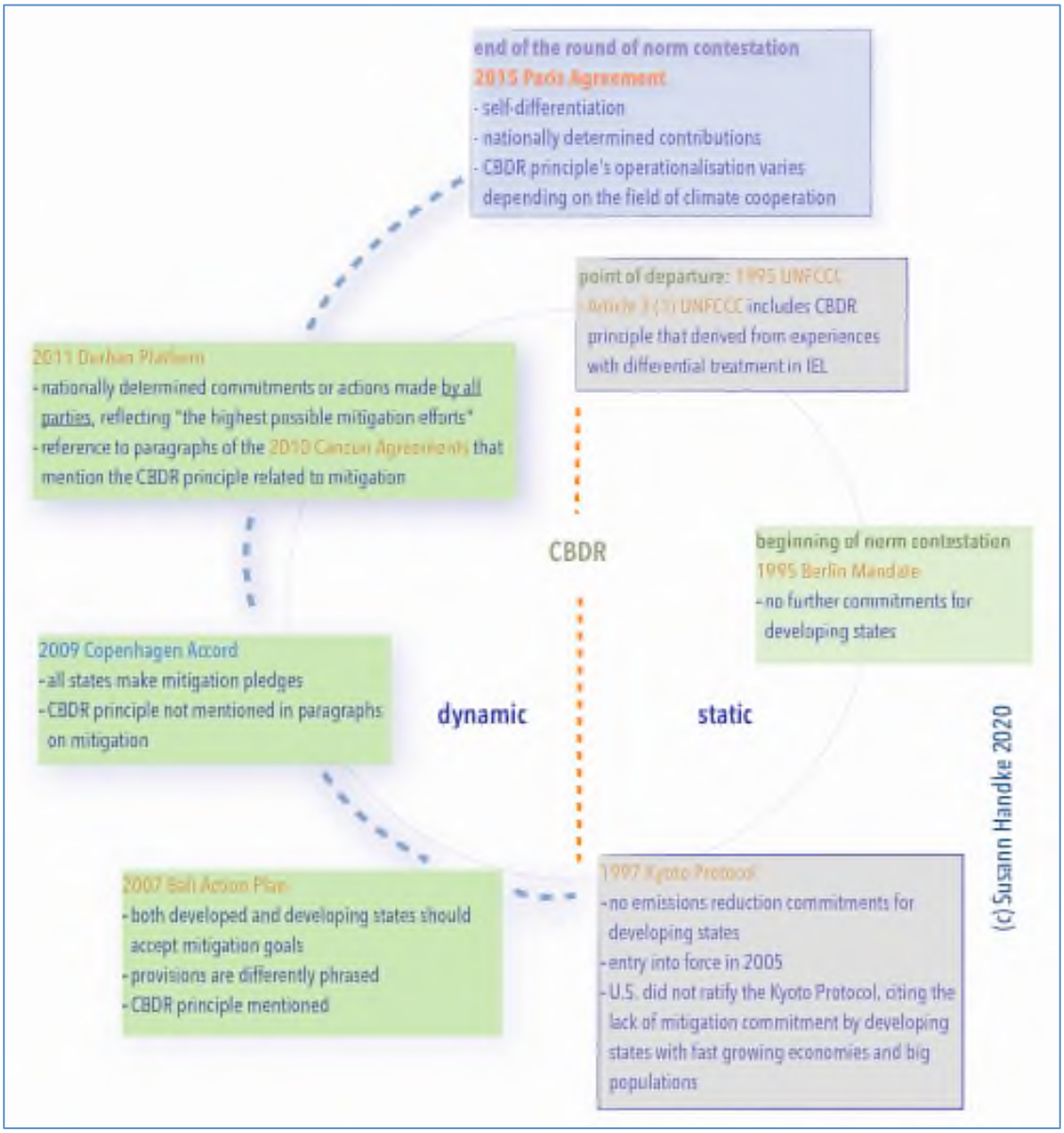
[13] Brunnée and Toope, 2010, 86.
[14] Norms can be considered as processes, mainly because they remain "work-in-progress." There is ongoing potential for contestation. *See*, Krook and True, 2010, 105.
[15] Sandholtz, 2008, 101, 103–5.

The parties interact with the normative structures that they have established; and their argumentation drives this process. The parties' deliberations usually lead to more clarity and refinement concerning the respective norms' application and interpretation.[16] Consequently, refined norms that derive from constant normative change give rise to a better reflection of the social reality that forms the regulatory context of these norms.

The CBDR principle underwent a cycle of normative change in the UN climate regime during the period from 1995 to 2015. Crucial outcomes of the international climate negotiations – such as the UNFCCC, Berlin Mandate, KP, Bali Action Plan,[17] Copenhagen Accord,[18] Durban Platform,[19] and PA – constitute this cycle's main stages (*see* figure 7.1). The phrasing of the CBDR principle, its prominent position in the documents, and its interaction with other provisions of the documents evince the changing interpretation of the principle. This process can be divided in a static phase (until 2005) and a dynamic phase (from 2005 onwards). The static period covers the years from the adoption of UNFCCC until the KP's entry into force. During this period, the CBDR principle's interpretation did not evolve in subsequent documents. A visualisation of its evolution is useful for grasping the stages of this process and relate them to the content of the documents. It also helps to contextualise the evaluation of the CBDR principle's textual refinement and re-interpretation in subsequent COP decisions and the PA.

[16] Norm contestation can also lead to norm failure. Jennifer Bailey analyses the example of international norms on commercial whaling. *See*, Bailey, 2008, 289–318.
[17] Bali Action Plan, Decision 1/CP.13 (FCCC/CP/2007/6/Add.1), 14 March 2008.
[18] Copenhagen Accord, Decision 2/CP.15 (FCCC/CP/2009/11/Add.1), 30 March 2010.
[19] Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action, Decision 1/CP.17 (FCCC/CP/2011/9/Add.1), 15 March 2012.

Figure 7.1: Stages of normative change, 1995–2015



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The point of departure for the CBDR principle's refinement is Article 3 (1) UNFCCC. This article includes the initial formulation of the principle in the UN climate regime and urges parties to "protect the climate system for the benefit of present and future generations of humankind … in accordance with their common but differentiated responsibilities and respective capabilities." In addition, this paragraph expects developed states to "take the lead in combating climate change and the adverse effects thereof." The UNFCCC's annex structure categorises the parties.[20] By doing so, the UNFCCC links the task of contributing to the regime's objective with the global economic conditions at the time of its adoption.

To specify the parties' commitments with regard to the mitigation of climate change a further legal instrument seemed necessary. Accordingly, by the mid-1990s a new negotiation process was initiated. The 1995 Berlin Mandate, which facilitated this negotiation process, expresses in paragraph 1 (a) that the process of negotiating a protocol or other legal instrument for the period beyond 2000 should be guided by Article 3 (1) UNFCCC. Paragraph 2 (b) interprets the CBDR principle and announces that the negotiation process will "[n]ot introduce any new commitments for Parties not included in Annex I, but reaffirm existing commitments in Article 4.1."

Article 4 (1) UNFCCC, by taking into account the CBDR principle, sums up commitments that all parties have, with respect to a wide range of information and research exchange, the promotion of education to enhance awareness of climate change, as well as the contemplation of mitigation and adaptation policies. Hence, whatever agreement would be achieved the commitments of developing states would not exceed this vaguely phrased provision of the UNFCCC.

Interestingly, when describing how the process of establishing a new legal instrument should develop the Berlin Mandate urges the "widest possible cooperation by all countries" and contextualises this demand by adding the UNFCCC's formulation of the CBDR principle and also considering the states' "social and economic conditions."[21] This was one of the first references to possible socio-economic indicators in an official document under the UNFCCC other than the categorisation of developed states in Annex I of the UNFCCC and, consequently, developing states as non-Annex I states.

Still, the adoption of the Berlin Mandate manifested an uncompromising interpretation of the CBDR principle and left little room for manoeuvre for the negotiations of the legal instrument that would, for the first time, set concrete targets for the reduction of greenhouse gas emissions. Figure

[20] *See*, subsection 4.3.1. of chapter four.
[21] Decision 1/CP.1, para 1 (e).

7.1 therefore describes the period from the adoption of the UNFCCC until the entry of force of the KP in 2005 as "static" with respect to the interpretation of the CBDR principle. Only during the COPs that were held afterwards, the debate among the parties about a more meaningful differentiation under the KP or a follow-up instrument entered a dynamic, more fruitful phase. From then onwards, it took almost a decade until the KP's rigid differentiation was overcome.

The preamble of the KP attests to the pivotal role of the Berlin Mandate. It refers to both Article 3 (1) UNFCCC and the Berlin Mandate.[22] The single focus on Annex-I parties – and thus the implementation of the Berlin Mandate – is obvious in Article 3 KP, which is the Protocol's main provision with respect to the reduction of greenhouse gas emissions. Article 10 KP specifies the commitments of the states parties under Article 4 (1) UNFCCC. This article applies to all parties and restates that it does not introduce any new commitments for non-Annex I parties, while "taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances."[23]

By including these multiple qualifiers, the phrasing of the CBDR principle in Article 10 KP goes beyond its wording in the UNFCCC, as it includes further criteria that contextualise a state's fair contribution with respect to the commitments of Article 4 (1) UNFCCC. In this context, the focus of the principle's extension relates to priorities of broader development policies and specific circumstances rather than the individual state's socio-economic situation.

The KP entered into force in 2005. The first meeting of the parties to the KP announced the Montreal Action Plan and commenced a process to consider further commitments for developed states for the period after 2012.[24] It seemed impossible to achieve an agreement on more contributions by developed states without also reconsidering the differentiation issue. In 2015, the states parties finally agreed on "further commitments" and basic principles to structure long-term climate cooperation under the UN climate regime.

The first essential step towards reconsidering the main premises of the UN climate regime was the 2007 Bali Action Plan.[25] This document started the dynamic phase of the norm contestation, as it signalled an end to the rigid approach to differentiation that the Berlin Mandate had introduced. The Bali Action Plan launched "a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action … to reach an agreed

[22] Paras 3 and 4, respectively.
[23] Article 10 KP.
[24] Consideration of commitments for subsequent periods for Parties included in Annex I to the Convention under Article 3, paragraph 9, of the Kyoto Protocol, Decision 1/CMP.1 (FCCC/KP/CMP/2005/8/Add.1), 30 March 2006, para 1.
[25] *See* chapter six for a description of shifting attitudes towards mitigation that are reflected in the Bali Action Plan.

outcome." [26] This outcome should address "[e]nhanced national/international action on mitigation of climate change," considering "[m]easurable, reportable and verifiable nationally appropriate mitigation commitments or actions … by all developed country Parties" and "[n]ationally appropriate mitigation action by developing country Parties."[27] This change constituted an important shift in the history of the UN climate regime. Although different approaches to developing and developed states were retained, the tenet that the Berlin Mandate had established was abandoned. For the first time, a process under the UNFCCC would consider commitments for developing states that would go beyond those included in the UNFCCC.

In its first paragraph, the Bali Action Plan urges states parties to develop a "shared vision for long-term cooperative action, including a long-term global goal for emission reductions."[28] This call for cooperative action is contextualised by the principle of common but differentiated responsibilities and respective capabilities that also demands to take into account "social and economic conditions and other relevant factors."[29] In the evolution of the CBDR principle's wording, this phrase constitutes a further broadening of criteria that could determine what a fair contribution to global climate action might look like. Thus, parties should not only consider socio-economic circumstances but also additional conditions that relate to climate change.

On 18 December 2009, the parties to the UN climate regime took note of the Copenhagen Accord. This formulation illustrates that the accord was not part of the regime and would never be acknowledged in the canon of official documents.[30] Nevertheless, the Copenhagen Accord was a crucial achievement, mainly because it was based on a political outcome that was primarily driven by negotiations between U.S. President Barrack H. Obama and the Chinese Premier Wen Jiabao. A consensus between the representatives of China and the United States would be a key precondition for overcoming the divide that the application of the CBDR principle in the KP had caused among the parties to the UNFCCC. Hence, the Copenhagen Accord constitutes an unusual outcome in the history UN climate regime with respect to the evolution of differential treatment under the regime. It hinted at pathway to break the gridlock.

In fact, the Copenhagen Accord refers to the CBDR principle in paragraph 1 related to the task of combating climate change. The principle is included in the wording that the UNFCCC provides. However, the principle is not mentioned in the accord's paragraphs 4 and 5 in which this document

[26] Decision 1/CP.13, para 1.
[27] Ibid., para 1 (b) (i) and (ii).
[28] Ibid., para 1 (a).
[29] Ibid., para 1 (a).
[30] *See*, the main stages of UN climate regime's evolution in chapter three.

calls on Annex-I parties and non-Annex I parties, respectively, to implement emissions reductions and mitigation action. By doing so, the Copenhagen Accord clearly confirms the need to go beyond the Berlin Mandate's interpretation of the CBDR principle.

The 2010 Cancun Agreements[31] brought the climate negotiations back on the official track. The main contribution of this document is its reiteration of the need for long-term cooperative action, while affirming that *inter alia* the CBDR principle should guide the implementation of the shared vision.[32] In the context of "enhanced action on mitigation," the Cancun Agreements distinguish between "nationally appropriate mitigation commitments or actions" by developed states and "nationally appropriate mitigation actions" by developing states.[33]

The CBDR principle is mentioned regarding contributions that developed states should undertake. It points to "respective capabilities" and goes further by "acknowledging" the historical responsibility of developed states, requiring that these states accept a leading role in combating climate change.[34] The "nationally appropriate mitigation actions" that developing states could undertake in order to enhance their mitigation actions are conditional on "the provision of finance, technology and capacity-building support" by developed states.[35]

The Copenhagen Accord and the Cancun Agreements, respectively, resulted in two main changes in the UN climate regime that hinted at a new approach. First, the Copenhagen Accord entailed that non-Annex I parties ought to implement mitigation measures that would go beyond the commitments that they had under the UNFCCC. Second, the Cancun Agreements no longer relied on the static distinction between parties based on Annex I of the UNFCCC. Using the attributes "developed" and "developing" to distinguish states allowed the parties to self-categorise their position within the UN climate regime. It also brought more flexibility into the regime that could reflect changing global economic circumstances more accurately. Variations of the two adjustments that the outcomes of the Copenhagen and Cancun COPs introduced would eventually become important cornerstones of the PA.

The next crucial revision occurred at the COP in Durban. The 2011 Durban Platform itself does not include the CBDR principle, but the related *Outcome of the work of the Ad Hoc Working Group on*

[31] The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, Decision 1/CP.16 (FCCC/CP/2010/7/Add.1), 15 March 2011.
[32] Ibid., para 1.
[33] *See* Decision 1/CP.16, under (II) and (III) (A) and (B).
[34] Decision 1/CP.16, recital prior to para 36.
[35] Ibid., recital prior to para 48.

Long-term Cooperative Action under the Convention mentions the CBDR principle.[36] The Durban Platform was an essential turning point in the international climate negotiations, mainly because it further developed the institutionalisation of national contributions. In fact, the gradual reconsideration of the CBDR principle's interpretation was vital for shifting to a bottom-up approach with respect to mitigation commitments. This step was made at the Lima COP one year prior to the adoption of the PA.

The 2014 Lima Call for Action rephrased the CBDR principle again. The new formulation was similar to the wording of the principle in a joint announcement[37] that was issued by U.S. President Barrack H. Obama and his Chinese counterpart Xi Jinping in November 2014. The announcement featured the positions on which both states agreed with respect to the upcoming climate negotiations.[38] The formulation of the CBDR principle that was included in this joint announcement introduced the qualifier "in light of different national circumstances."[39] An identical re-phrasing appeared in the Lima Call for Climate Action that added "in light of different national circumstances" to the CBDR principle when demanding that the new legal instrument under the UNFCCC should "reflect" this principle.[40]

The PA mentions the CBDR principle in a phrasing that is almost identical to the one that the Lima Call for Climate Action had introduced. The principle is included in the PA's third preambular paragraph, in Article 2 (2), as well as in the paragraphs 3 and 19 of Article 4. The PA's implementation thus should reflect the CBDR principle.[41] Article 4 (3) directly relates the design of the states parties' successive NDCs to the CBDR principle, while paragraph 19 of this article points to the CBDR principle in the context of the formulation of long-term decarbonisation strategies. Hence, the principle of *common but differentiated responsibilities and respective capabilities, in the light of different national circumstances* is closely linked to the parties' mitigation efforts.

To sum up, this section focused on the stages of the normative change that the CBDR principle underwent in the UN climate regime, tracing textual adjustments in COP decisions. This process can be divided in a static phase (until 2005) and a dynamic phase (from 2005 onwards), as figure 7.1

[36] Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, Decision 2/CP.17 (FCCC/CP/2011/9/Add.1), 15 March 2012, recital prior to para 1.
[37] The White House – President Barack Obama, "U.S.-China Join Announcement on Climate Change," 12 November 2014, https://obamawhitehouse.archives.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change; "中美发布应对气候变化联合声明" [China and the U.S. publish a joint announcement on the climate change action], 12 November 2014, http://politics.people.com.cn/n/2014/1112/c70731-26010508.html.
[38] *See* chapter six.
[39] "U.S.-China Join Announcement on Climate Change," para 2.
[40] Decision 1/CP.20, para 3.
[41] Article 2 (2) PA.

shows. The situation changed when the parties acknowledged the need for more ambitious efforts to mitigate climate change. The call for greater commitments to be undertaken by developed/Annex-I states reinforced the debate about developing states' contributions to mitigation, specifically regarding those states parties with large populations and growing economies. The 2007 Bali Action Plan created an initial opening for discussing commitments by developing states.

The following years witnessed a dynamic evolution of the phrasing and interpretation of the CBDR principle until the adoption of the PA, as figure 7.1 illustrates. This process was closely linked to an ever more elaborated bottom-up approach to mitigation action. Indeed, figure 7.1 depicts the cycle of normative change as a spiral moving in an upward direction. This points to an improvement or higher quality of the evolving normative structure. The next sections will further examine this aspect of the CBDR principle's evolution.

The re-phrasing of the CBDR principle centred on socio-economic qualifiers, covering a broad spectrum of "national circumstances." This gives the parties a high level of flexibility to assess their energy situation and the growing effects of climate change on their economies and societies. Based on an assessment of their respective domestic situations, they thus self-categorise their positions in relation to global mitigation efforts. The concept of self-categorisation or self-differentiation has important consequences for the regulation of various aspects of climate cooperation under the PA, as will be discussed in section 7.3. The next subsection deploys the perspective of norm constructivism to trace the CBDR principle's evolution.

7.2.2. Reaching a new equilibrium

Building on the textual assessment of the CBDR principle and findings of norm research, this sub-section depicts the gradual refinement of the CBDR principle as a cycle of normative change (*see* figure 7.2). It links the textual evidence of the principle's evolution to the stages in Sandholtz's model of normative change,[42] which was introduced in chapter two and further explained in chapter four.[43] This visualisation shows how the CBDR principle's refinement created rulemaking space for the restructuring of the UN climate regime.

[42] Sandholtz, 2008, 104.
[43] *See*, subsections 2.3.2. and 4.4.2., respectively.

The CBDR principle is not a rule that sets forth unequivocal guidelines for states parties' action within the UN climate regime. Rather, the CBDR principle follows a state party's interpretation of its role within in the regime, shapes the formulation of rules and safeguards the constant acknowledgement of the position of developing states, for instance when instruments are designed and commitments are agreed on the aim to mitigate climate change. Thus, when states parties' shared understanding regarding the interpretation of the principle evolves, adjusted rules will eventually reflect the principle's norm-shaping capability.

Norm research can help illustrate this process, as it explores the change of norms in international society. When assessing the development of norms, reviewing instances of norm contestation is essential. The process of contestation and the path to a new equilibrium of a shared understanding regarding the contested norm can be divided in four stages, as already explained in chapter two. The *rule structure* of a treaty or provision in an agreement shapes actors' choices (I). However, some *actions* that one party considers in accordance with the rule might result in disputes with other parties to the specific regime (II). *Disputes* about the proper interpretation and application of a rule lead to *arguments*. These arguments are driven by the specific criticisms that parties have concerning the actions taken by other parties. The argumentation on both sides is shaped by *precedents* in the same regime or in other regimes under comparable circumstances. The presentation of a number of recent precedents helps parties that are involved in the process of norm contestation to both influence other parties' expectations and increase the persuasiveness of their arguments.[44]

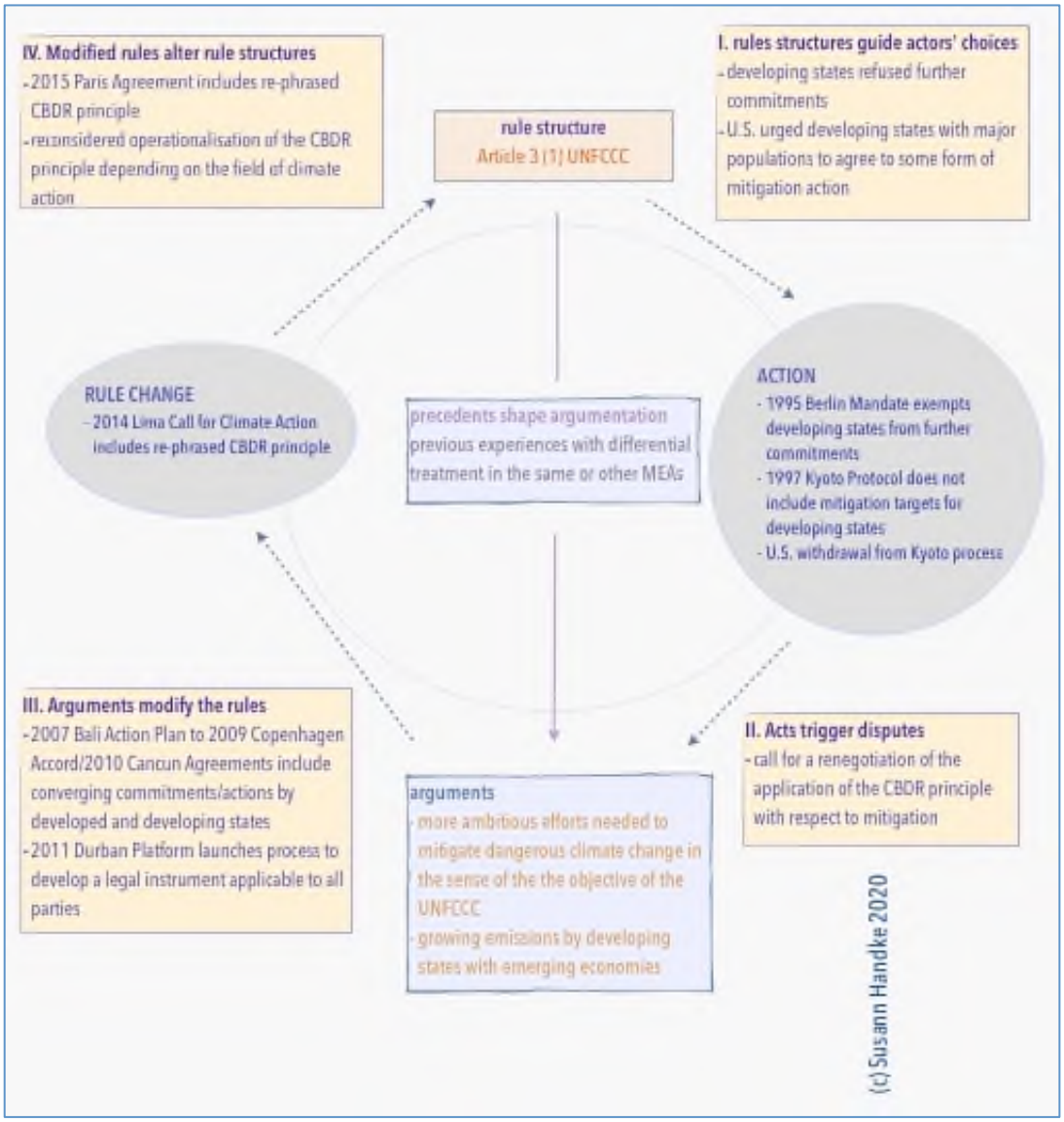
Eventually, the presentation of arguments *modifies rules* (III) and changes the rule in question or adjusts its interpretation. This process thus *transforms the rule structure* (IV). The changed rule structure creates a new social fact for the parties to the regime, providing normative guidance for their actions under the regime. Hence, the rule structure (re-)defines actors' choices and actions. Subsequent interpretations of the transformed rule and actions might lead to a new round of normative change.[45]

[44] This paragraph summarises an explanation of the cycle of normative change in general and with respect to the CBDR principle that was detailed in the subsections 2.3.2. and 4.4.2.
[45] *See*, subsections 2.3.2. and 4.4.2.

Inspired by this conceptualisation of norm development, this subsection illustrates the stages of the contestation of the CBDR principle. The previous subsection already summarised textual changes noticeable in treaties and COP decisions that gradually refined the CBDR principle's wording. The illustration of the CBDR principle's evolution as a cycle of normative change in figure 7.1 highlighted the relationship between bottom-up reconstruction of the UN climate regime and the evolution of the CBDR principle. It also showed that the reversal of the approach to mitigation evolved simultaneously with the changing phrasing and interpretation of the CBDR principle. The texts of COP decisions and the PA contain several variations of the CBDR principle that point to a reinterpretation.

Figure 7.2 takes a more granular perspective on the process of normative change and shows when actions were taken and at which stage precedents and arguments shaped this cycle of normative change. In fact, in the UN climate regime the necessity to adjust the interpretation of the CBDR principle became obvious when its operationalisation in the KP was contested. Given the changing context, the basis for differentiation and the scope of differentiation were reassessed. During this phase of the regime's development, further negotiations were necessary. In this phase, it is vital to keep in mind that the CBDR principle is a principle and not a rule. It informs the formulation of rules. In other words, the interpretation of the CBDR principle itself and its influence of the wording of rules can change in the course of a regime's maturing. Hence, the result of the cycle of normative change was an adjusted interpretation or redefinition of the CBDR principle in the UN climate regime. Eventually, the principle's redefinition shaped its operationalisation in the PA.

Figure 7.2: Cycle of normative change, 1995–2015



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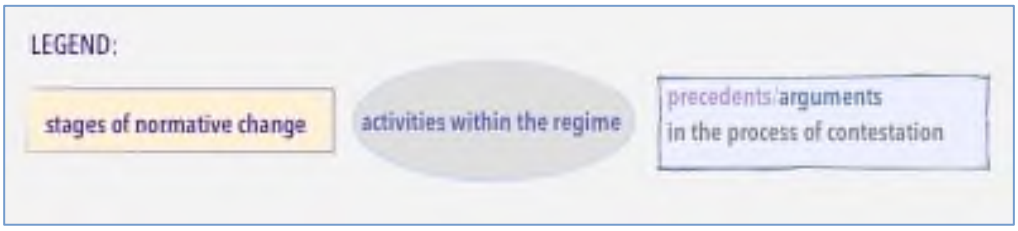

The cycle of normative change departs from the CBDR principle in Article 3 (1) UNFCCC. This article forms the rule structure that guided the parties' choices and led to the adoption of the 1995 Berlin Mandate. The interpretation of the CBDR principle included in the Berlin Mandate became the basis for the operationalisation of the CBDR principle in the KP. It was also linked to the withdrawal of the U.S. from this treaty, an action that triggered disagreement among the parties. This instance of contestation greatly influenced the climate negotiations from 2005 onwards.

Several factors shaped the climate negotiations during this period. Some arguments for a revision of the rigid differentiation that the KP deployed derived from within the regime, based on the objective of the UN climate regime and the changing emissions patterns. Indeed, greenhouse gas emissions from developing states were rising fast after the turn of the century. China's emissions were on the path to overtake annual emissions from the U.S. Thus, the debate included considerations that linked changing economic conditions and related emissions with a state party's position within the regime. In addition, the evolution of the UN climate regime took place against the backdrop of the adoption of various MEAs, as subsection 4.2.3.2. of chapter four discussed. The development of differential treatment in other MEAs provided contemporaneous precedents that contextualised the negotiations of the UN climate regime's approach to differentiation. None of these MEAs entirely exempts developing states from commitments regarding the objective of the environmental regime in question.

In the course of the climate negotiations, the 2009 Copenhagen Accord was an important juncture. In this political agreement both the U.S. and China supported national mitigation pledges. This foreshadowed the move to commitments by all parties and the bottom-up design of mitigation action. In the course of normative change, such an event is described as "tipping point" – i.e. the point in time when enough relevant or critical states support a new norm.[46] By adopting the Cancun Agreements, the states parties to the UNFCCC endorsed this revised approach to mitigation action.

Eventually, political agreement and practical considerations concerning a broader base for mitigation action, driven by the need for more ambitious climate action, formed the reason for shifting to nationally determined mitigation contributions. The implicit adjustment of the CBDR principle's interpretation (all parties would have obligations) created rulemaking space for this move. Accordingly, coinciding with the refinement of the CBDR principle the acceptance of the bottom-up approach to mitigation took shape. The focus of the debate moved to the issue of how differential

[46] Bailey, 2008, 291.

treatment and fair burden sharing is achieved in a framework in which all parties undertake commitments that are nationally determined. Hence, the refinement of the CBDR principle's interpretation was intrinsically linked with the restructuring of how mitigation action is managed under the UN climate regime. In order to finalise the structural revision of the UN climate regime's approach to mitigation action, the states parties needed to deal with the issue of differentiation. Only a comprehensive resolution could result in a new legal instrument.

The 2014 joint announcement by the United States and China once again marked a tipping point, indicating growing convergence among states that were vital for the promotion and acceptance of normative change. This time, it concerned the wording of the CBDR principle. The 2014 Lima Call for Climate Action then finished the process of rephrasing the CBDR principle. The adoption of the PA finalised the modification of the rule structure, including the refined CBDR principle.

This instance of norm contestation in the UN climate regime shows that within each MEA the principle necessarily evolves differently to retain its relevance in relation to the objective of the environmental regime and the parties' commitments. Thus, the role of the principle is different in accordance with characteristics of the MEA in question. Chapter four highlighted the CBDR principle's shifting role in the course of an MEA's evolution that generally follows three phases. In the negotiation phase, it ensures that the socio-economic position of developing states are considered in the process of formulating treaty provisions. Then, the CBDR principle is operationalised during the implementation phase of the MEA, resulting in differentiated commitments of developed and developing states.[47]

The above-described negotiation process after 2005 and its outcome in the case of the UN climate regime highlights the shifting role of the CBDR principle in a maturing regime. As suggested in chapter four, the principle assisted the states parties during negotiations phase, by ensuring that adjusted rules would continue to take into account the concerns of developing states. It also guided states parties' efforts to reassess the changing circumstances under which the regime is implemented, in particular the states' contribution to the environmental degradation problem at hand. Indeed, rising emissions from developing states were one of the arguments that greatly influenced the negotiations.

The development of the UN climate regime clearly reflects this layered role of the CBDR principle. Its nature as a rule-shaping principle allowed for – or even necessitated – a reassessment

[47] *See*, subsection 4.2.3.3. and table 4.1 in subsection 4.3.4. of chapter four.

of its operationalisation in the next phase of mitigation cooperation, while its procedural operationalisation facilitated the negotiation process during the regime's maturing. Hence, the CBDR principle guided the parties' negotiations to reconcile their commitments with the principle's normative spirit.

A brief recall of the rule structure under the UNFCCC and the CBDR principle's operationalisation in both the Berlin Mandate and KP, prescribing a rigid form of differentiation, attests to the profound change that was accomplished by this instance of norm contestation that figures 7.1 and 7.2 visualised and that this subsection analysed. The next section examines the operationalisation of the CBDR principle in the PA and the consequences thereof for the principle's contribution to the legality of the UN climate regime.

7.3. Restoring legality

One of the remarkable features of the PA is the way in which the CBDR principle is operationalised in relation to different fields of climate action. This difference compared to the Kyoto approach warrants closer scrutiny. To examine the changes in the approach to differentiation, this section examines the operationalisation of the CBDR principle in the PA, Decision 1/CP.1, and in provisions of the Katowice Rulebook that relate to climate action. The analysis in this section addresses the second part of the research question that this dissertation seeks to answer:

> *How did experiences from domestic climate and energy legislation contribute to a substantive bottom-up reconstruction of the UN climate regime;* ***and how does this reconstruction relate to the CBDR principle****?*

Chapter six already answered the first part of the question and concluded that the development of domestic energy and climate measures and their enactment through legislation and policy strategies laid the basis for a bottom-up reconstruction of the UN climate regime during the first decade of the 21st century. Further examination of the innovations in the Paris approach is necessary in order to answer the second part of the research question. Accordingly, subsection 7.3.1. provides an overview of the operationalisation of the CBDR principle under the PA, including the most important rules on

climate cooperation that the Katowice Rulebook[48] sets forth. The final part of this subsection links the findings to the premises of differential treatment in international environmental law and the UN climate regime's position within this field of international law. The second subsection (7.3.2.) focuses on how the refined CBDR principle advances the substantive development of the regime. Based on Brunnée and Toope's theoretical approach, the analysis centres on the legality of mitigation action and the operationalisation of the CBDR principle under the PA.

7.3.1. Forms of differentiation under the Paris Agreement

Article 2 (2) PA mentions the CBDR principle and stipulates that the implementation of the agreement will reflect "equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances." The principle is also included in paragraph 3 of Article 4, which regulates nationally determined contributions (NDCs). In this paragraph, the CBDR principle specifically circumscribes the notion of "highest possible ambition" when designing successive submissions concerning national climate action. Generally, successive submissions should "represent a progression" compared to the states parties' initial NDCs.[49]

Paragraph 19 of Article 4 relates the CBDR principle to the formulation and communication of national decarbonisation strategies. Thus, this paragraph links national climate and low-carbon policies with the objective of the agreement and the need to ensure fair burden-sharing in the global context. Yet, both aspects are necessarily part of the *national* debate about climate policy and should be considered in the process of national climate and energy law making. The linkage between the international and national levels that Article 4 (19) PA creates will be further explored in section 7.4.

Decisions 3/CMA.1[50] guides the implementation of the PA. In its fourth preambular paragraph, the decision refers to Article 2 (2) PA. This preambular paragraph thus recalls that the coverage of the CBDR principle extends to all decisions of the Katowice Rulebook. However, the principle is not explicitly included in any other decision of the Rulebook. The following subsections examine how the PA and related decisions of the Katowice Rulebook enable differential treatment for developing states in different fields of climate cooperation.

Several articles of the PA that outline obligations of the parties include some form of differentiation between parties. In these provisions, differentiation is signalled by pointing out what is

[48] The Katowice Rulebook is not a book. The part that seeks to clarify the implementation of the Paris Agreement consists of 20 decisions – decisions 1 to 20/CMA.1. This subsection will refer to the decisions (and not use the term Katowice Rulebook) to point to the rules that guide the application of specific articles of the Paris Agreement or paragraphs of Decision 1/CP.21.
[49] Article 4 (3) PA.
[50] Matters Relating to the Implementation of the Paris Agreement, Decision 3/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019.

expected of developed states or by highlighting the needs of developing states and, more specifically, the vulnerabilities of least developed states and small island developing states. These articles primarily regulate the components of climate cooperation that COP-17 put forward in the 2011 Durban Platform.[51]

These so-called "Durban components" include mitigation, adaptation, finance, technology development and transfer, transparency, and capacity building. The articles of the PA that pertain to these components of climate cooperation either mention the CBDR principle explicitly or reflect the principle's operationalisation by providing for some form of differentiation. To understand the CBDR principle's implementation, it is worthwhile to assess the principle's operationalisation in these articles. Thus, this subsection explores how the principle is operationalised in the PA and how the decisions of the Katowice Rulebook delineate differential treatment in the context of the "Durban components."

7.3.1.1. Mitigation

Reducing the amount of greenhouse gases that is emitted into the atmosphere is the primary climate action that the UN climate regime regulates. Serious efforts are needed to mitigate climate change, in order to achieve the objective of preventing a global temperature rise beyond 2˚C. The CBDR principle's operationalisation in the PA's mitigation provisions is different from the Kyoto approach. The PA does not correlate the kind and extent of mitigation action with the categorisation of states in the UNFCCC's Annex I or the KP's Annex B. It essentially combines self-categorisation with differential treatment afforded to developing states. This approach can be found in Article 4 PA and in the decisions of the Katowice Rulebook that relate to mitigation activities. This subsection examines differentiation in the context of mitigation action under the PA.

Article 4 (2) PA stipulates a bottom-up approach to mitigation commitments. These nationally determined contributions are based on national policies. The states parties have to pursue "domestic mitigation measures, with the aim of achieving the objective of such contributions." This provision is binding for and applicable to all parties.[52] Furthermore, pursuant to Article 4 (8) PA all parties are required to provide information about their NDCs that is "necessary for clarity, transparency and understanding." Article 4 (9) requires all parties to communicate their NDCs every five years. Pursuant to Article 4 (13) PA, all parties must keep track of the development of their greenhouse gas

[51] Decision 1/CP.17, para 5.
[52] *See* chapter six.

emissions in relation to their NDCs. Finally, all parties should implement national decarbonisation strategies.[53]

Decision 4/CMA.1 [54] provides details on how the states parties should organise their cooperation on the above-mentioned mitigation action. This decision does not mention the CBDR principle. In its fourth preambular paragraph, it "recalls" Article 4 (5) PA which stresses that developing states should be supported, as enhanced support "will allow for higher ambition" in these states' actions.[55] Decision 4/CMA.1 mainly concerns the content of information that all states parties have to provide regarding their NDCs and offers guidance on the preparation and development of NDCs.

Although Decision 4/CMA.1 does not mention the CBDR principle, it clarifies how the principle has to be operationalised in accordance with Article 4 PA and Decision 1/CP.21[56] Paragraph 6 of Annex I to Decision 4/CMA.1 is particularly relevant in this regard. This paragraph sums up which consideration states parties have to include in their NDCs in order to explain how their NDCs are "fair and ambitious in the light of its national circumstances."[57] The list vaguely requires states parties to present an elaboration of "fairness considerations, including reflecting on equity."[58]

Paragraph 6 (c) of Annex I refers to Article 4 (3) PA that demands successive NDCs submissions to show how they constitute a "progression" compared to previous NDCs and how they reflect the CBDR principle. Developed states' NDCs have to explain how they fulfil Article 4 (4) PA, in the sense that developed states have to continue to take the lead "by undertaking economy-wide absolute emission reduction targets,"[59] while developing states have to explain how they continue to enhance their mitigation efforts and try to move "towards economy-wide emission reduction or limitation targets in the light of different national circumstances."

Finally, Paragraph 6 (e) of Annex I requires least developed states and small island developing states to discuss, in their NDCs, their efforts to "prepare and communicate strategies, plans and actions for low greenhouse gas emissions development reflecting their special circumstances," in accordance with Article 4 (6) PA. Thus, Paragraph 6 of Annex I of Decision 4/CMA.1 allows states parties to self-categorise. It combines available classifications with substantive obligations related to

[53] Article 4 (19) PA.
[54] Further Guidance in Relation to the Mitigation Section of Decision 1/CP.21, Decision 4/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019.
[55] Fourth preambular paragraph of Decision 4/CMA.1.
[56] Decision 4/CMA.1 specifically sets forth rules for paragraphs 26, 28, and 31 of Decision 1/CP.1.
[57] Paragraph 6 (a) of Annex I of Decision 4/CMA.1.
[58] Paragraph 6 (b) of Annex I of Decision 4/CMA.1.
[59] Paragraph 6 (d) of Annex I of Decision 4/CMA.1.

parties' communications about their NDCs. The differentiation thus concerns the communication about the NDCs and, ultimately, the content of each state's contribution.

The PA includes various instruments to differentiate among parties' mitigation obligations. Article 4 (1) PA recognises that the peaking of greenhouse gases will take longer in the case of developing states, while the parties try to collectively achieve global peaking "as soon as possible" and balance anthropogenic emissions through sinks in the second half of the 21st century. Article 4 (3) PA demands that successive NDCs have to present a progression but should also reflect the CBDR principle.

Article 4 (4) differentiates broader mitigation efforts between developed and developing states. The former should take the lead and undertake economy-wide emissions reduction targets, while the latter should increase their efforts and "are encouraged" to take up economy-wide emissions reduction or limitation targets at a later stage. This formulation and the postponed peaking of emission for developing states form a grace period – a tool of differential treatment that other MEAs also include.[60] The formulation "in the light of different national circumstances" qualifies this provision. However, the goal of achieving carbon neutrality "in the second half of this century" and the need for progression of NDCs, as included in Articles 4 (1) and 4 (3) PA, respectively, contextualise the extent of the grace period.

Article 4 (5) PA demands that developing states receive support in terms of finance, technology, and capacity-building in order to enable them to strengthen their mitigation efforts. Article 4 (6) PA specifically considers least developed states and small island developing states, by expressing that they "may prepare and communicate" strategies for low-carbon development that reflect "their special circumstances."

Two other issues are closely related to mitigation activities under the PA – i.e. the use of common timeframes for NDCs and the regulation of the voluntary mechanisms to transfer mitigation outcomes. Article 4 (10) PA obliges the first conference of the parties serving as the meeting of the parties to the PA (CMA) to "consider" common timeframes. The first CMA took place simultaneously with COP-24 in Katowice in December 2018. At that time, however, negotiators were unable to agree on the issue. Decision 6/CMA.1 only puts forward that common timeframes will be implemented from 2031 onwards.[61] A more concrete decision about this matter was handed over to the Subsidiary

[60] *See* chapter four, in particular subsection 4.2.3.2. that contains a brief overview of the ozone regime and the approach of the Montreal Protocol.

[61] Common Time Frames for Nationally Determined Contributions Referred to in Article 4, paragraph 10, of the Paris Agreement, Decision 6/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019, para 2.

Body of Implementation that serves the UNFCCC. In summer 2019, this body only agreed "to continue the consideration" of the matter.[62]

This delay in establishing further rules is important for two reasons. First, common timeframes are particularly vital for the effectiveness of the global stocktake.[63] They simplify the evaluation of the overall progress and the coordination of global climate action. This will only be possible from 2031 onwards, if parties will be able to agree on further modalities by then. Moreover, from the perspective of transparent cooperation a common frequency of updating NDCs is helpful. It facilitates the comparison of national contributions, which is essential to foster trust in the fairness and equity that subsequent NDCs have to convey.

Second, it seems that parties are reluctant to accept shorter timeframes, mainly because they would imply a more frequent increase in the ambition regarding states parties' mitigation action. Some developing states suggested that common timeframes should only apply to developed states.[64] In essence, the disagreement about the regulation of a common frequency of NDCs illustrates that the contestation of the approach to differentiation under the PA is moving to very detailed, but nonetheless consequential, matters.[65] As will be shown in subsection 7.3.1.4., the transparency framework is another example of this form of continued contestation.

Another yet unsolved issue is the trade in "internationally transferred mitigation outcomes."[66] Article 6 PA allows for the creation of a tool to transfer mitigation outcomes. This article proposes two voluntary instruments for international climate cooperation – i.e. a mechanism to contribute to the mitigation of greenhouse gases and support sustainable development[67] and non-market approaches to assist parties in implementing their NDCs.[68] Both "cooperative approaches" are available to all states parties. Their design does not differentiate between developed and developing states with respect to the states' roles in implementing the mechanisms. Thus, both developed and developing states can be host states of projects to obtain what Article 6 (2) PA calls "internationally transferred mitigation outcomes."

[62] Common Time Frames for Nationally Determined Contributions Referred to in Article 4, paragraph 10, of the Paris Agreement, Document (FCCC/SBI/2019/L.10), 25 June 2019, para 3.
[63] *See* on the relevance of the global stocktake for the interaction between national policies and legislation and global climate cooperation, subsection 6.5.
[64] Earth Negotiations Bulletin (ENB), "Summary of the Bangkok Climate Change Conference: 4–9 September 2018," Volume 12, Number 733, 12 September 2018, http://enb.iisd.org/download/pdf/enb12733e.pdf, p. 7.
[65] *See* further, subsection 7.3.1.6.
[66] Article 6 (2) PA.
[67] Article 6 (4) PA.
[68] Article 6 (8) PA.

These outcomes can be used to achieve a party's NDC.[69] A "share of the proceeds" from the activities will be used to cover administrative costs and assist developing states "that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation." Yet, the parties failed to include in the Katowice Rulebook a substantive decision that details the rules, modalities, and procedures of these transfers, as required by Article 6 (7) PA. The initiation of the trade with mitigation outcomes will therefore be delayed. This inaction also prolongs the uncertainty about the fate of the flexibility mechanisms under the KP.[70]

Finally, under the PA the states parties are required to consider the concerns of parties "with economies most affected by the impacts of response measures," in particular developing states.[71] Detailed rules for cooperation on these issues are regulated in Decision 7/CMA.1.[72] Pursuant to Paragraph 33 of Decision 1/CP.21, the "forum on the impact of the implementation of response measures"[73] will continue its work under the PA. Paragraph 2 of the Annex to Decision 7/CMA.1 details that this forum works to deal with concerns of all parties, especially developing states, related to economic transitions, social disruptions, effects of mitigation measures, and tools and methodologies to assess the impacts of response measures.[74]

To sum up, the core of the PA is its approach to mitigation. This obligation was designed to apply to each party and would require an increasingly ambitious effort to mitigate climate change, as the Durban Platform demanded.[75] The PA and the decisions of the Katowice Rulebook also offer a certain degree of flexibility to grant developing states grace periods with respect to the peaking of greenhouse gas emissions and economy-wide decarbonisation. Moreover, developing states are eligible for support in order to enable them to achieve their NDCs. Hence, the PA affords various forms of differential treatment to developing states, while all states have mitigation obligations, which they can determine based on national policies.

In answer to the research question on the relationship between the bottom-up approach to mitigation action and the CBDR principle, two observations need to be highlighted. First, the ope-

[69] Article 6 (3) PA.
[70] The "Draft CMA decision on the rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement" includes a section (paragraphs 92 to 109) that regulates the transition of the clean development mechanism and joint implementation to the newly created mechanism, including the transition of credits. *See* draft document at https://unfccc.int/documents/197876.
[71] Article 4 (15) PA.
[72] Modalities, Work Programme and Functions of the Forum under the Paris Agreement on the Impact of the Implementation of Response Measures, Decision 7/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019.
[73] This forum was established in 2010 by COP-16 in order to develop a work programme to deal with impacts of response measures. It initially collected the experiences related to the response measures under the UNFCCC and KP. *See*, Decision 1/CP.16, para 93; United Nations – Climate Change, "Forum on the Impact of the Implementation of Response Measures," https://unfccc.int/topics/mitigation/workstreams/response-measures/forum-on-the-impact-of-the-implementation-of-response-measures.
[74] Paragraph 2 (a) to (d) of the Annex to Decision 7/CMA.1.
[75] *See*, Decision 1/CP.17, para 7.

rationalisation of the CBDR follows the patterns of granting differential treatment to developing states. It provides support with respect to core mitigation obligations, such as the preparation of NDC submissions and the application of grace periods. Second, given the fact that each state has mitigation obligations that derive from national policies, the core mitigation obligations follow the self-categorisation of the parties. As a result, the focus of contestation of how the CBDR principle applies to climate cooperation under the PA will possibly shift to the design and content of specific rules (modalities, procedures, and guidelines) that implement the PA. Hence, mitigation and the operationalisation of the CBDR principle continue to interact, albeit in more subtle ways.

7.3.1.2. Adaptation

Article 7 (1) PA defines the global goal on adaption to climate change – i.e. "enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change." This goal is contextualised by the need to promote sustainable development and an adequate effort to contribute to limiting the global temperature rise to 2˚C. In this component of climate cooperation under the PA, differentiation resembles the "conventional" approach to differential treatment in international environmental law. Developed states are required to support developing states[76] or developing states are exempted from additional burdens.[77]

Article 7 (2) PA reminds the states parties that, while they face a global challenge, requiring them to "protect people, livelihoods and ecosystems," they should consider "urgent and immediate needs" of developing states that are "particularly vulnerable to the adverse effects of climate change."[78] Article 7 (6) PA demands that states parties take into account the needs of developing states in their cooperation on adaptation efforts. Pursuant to Article 7 (7) (d) PA, international adaptation cooperation should assist developing states in "identifying" their adaptation needs and familiarise them with effective adaptation practices as well as support them to implement adaptation action.

Although all parties have to submit and update adaptation communications, the submission of these communications should not create additional burdens for developing states.[79] Decision

[76] Article 7 (6), (7) (d), and (13) PA.
[77] Article 7 (10) PA.
[78] Article 7 (2) PA.
[79] Article 7 (10) PA.

9/CMA.1[80] further details the content of these communications. The aims of the adaptation communications include efforts to strengthen adaptation action and support for developing states.[81] The form of the adaptation communication is "country-driven and flexible" and must "not pose any additional burden" on developing states and cannot be reviewed or used as basis for comparison between parties.[82] Pursuant to Article 7 (12) PA, these communications will be archived in a public registry, regulated by Decision 10/CMA.1.[83] Developed states are "urged" to provide resources "on a voluntary basis" to mobilise support for adaptation activities in developing states.[84] In case developed states provide such support, their adaptation communications also include these activities.[85]

Article 7 (13) PA calls for "[c]ontinuous and enhanced international support" for developing states, including financial means, technology, and assistance for capacity-building, in order to enable them to implement adaptation measures. The global stocktake, set forth in Article 14 PA, also recognises adaptation efforts that developing states make.[86]

Finally, Decision 13/CMA.1[87] regulates the continuation of the Adaptation Fund[88] under the PA. Proceeds from the mechanisms under Articles 6, 12, and 17 of the KP will be further used to finance the fund, until proceeds from activities under Article 6 (4) PA will be available.[89] In addition, the Adaptation Fund also accepts "a variety of voluntary public and private sources."[90]

7.3.1.3. Finance and support

Article 9 (3) PA requires developed states to "continue to take the lead in mobilizing climate finance," while "country-driven strategies" should take into account the needs and priorities of developing states. Every two years, developed states have to report "quantitative and qualitative information" about financial support[91] that they make available for mitigation and adaptation in developing states

[80] Further Guidance in Relation to the Adaptation Communication, Including, inter alia, as a Component of Nationally Determined Contributions, Referred to in Article 7, Paragraphs 10 and 11, of the Paris Agreement, Decision 9/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019.
[81] Decision 9/CMA.1, para 1 (b).
[82] Decision 9/CMA.1, para 2 (a) and (b).
[83] Modalities and Procedures for the Operation and Use of a Public Registry Referred to in Article 7, Paragraph 12, of the Paris Agreement, Decision 10/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019.
[84] Decision 9/CMA.1, para 19.
[85] Paragraph (a) of the Annex to Decision 9/CMA.1.
[86] Article 7 (14) (a) PA.
[87] Matters Relating to the Adaptation Fund, Decision 13/CMA.1 (FCCC/PA/CMA/2018/3/Add.2), 19 March 2019.
[88] The Adaptation Fund was established by Decision 10/CMP.7 to finance concrete adaptation projects and programmes in developing states parties. See, Funding under the Kyoto Protocol, Decision 10/CMP.7 (FCCC/CP/2001/13/Add.1), 21 January 2002, para 1.
[89] Decision 13/CMA.1, paras 2 and 3.
[90] Decision 13/CMA.1, paras 5.
[91] Article 9 (5) PA.

and relating to their efforts in taking the lead "in mobilizing climate finance" in accordance with Article 9 (3) PA. Decision 12/CMA.1[92] details the information that is required to fulfil these obligations. Article 9 (4) PA calls for greater efforts to provide financial resources for particularly vulnerable developing states. Information about the allocation of climate finance by developed states is also part of the global stocktake.[93]

Furthermore, the Financial Mechanism[94] of the UNFCCC is required to assist developing states with "simplified approval procedures and enhanced readiness support."[95] In accordance with Paragraph 53 of Decision 1/CP.21, a new collective quantified goal from a floor of U.S.$100 billion per year has to be set, "taking into account the needs and priorities of developing countries." Paragraph 1 of Decision 14/CMA.1[96] announces that "deliberations" about a new goal will be *initiated* during the third CMA in November 2020. Hence, the amount of funding in this regard will be unknown for years to come.

In addition to finance, the PA also calls for assistance for developing states through the provision of technology in order to promote both mitigation and adaptation actions.[97] A technology framework that Article 10 (4) PA establishes provides guidance with respect to the development and transfer of technology. Decision 15/CMA.1[98] stipulates purpose and principles of this technology framework. Coherence, inclusiveness, results-oriented and transformational approaches, and transparency should guide the cooperation that has to be "designed and implemented in a manner that facilitates the active participation of all relevant stakeholders and takes into account sustainable development, gender, the special circumstances of the least developed countries and small island developing States."[99]

This form of cooperation should help states parties "to build resilience and reduce their emissions," by accelerating and scaling up "innovation at different stages of the technology cycle," the cooperation has to be undertaken in a way that enhances the "effective participation" of developing states.[100] Assistance is understood to be "broader than just financial support."[101]

[92] Identification of the Information to Be Provided by Parties in Accordance with Article 9, Paragraph 5, of the Paris Agreement, Decision 12/CMA.1 (FCCC/PA/CMA/2018/3/Add.1), 19 March 2019.
[93] Article 9 (6) PA.
[94] Article 11 UNFCCC.
[95] Article 9 (8), (9) PA.
[96] Setting a New Collective Quantified Goal on Finance in Accordance with Decision 1/CP.1, Paragraph 53, Decision 14/CMA.1 (FCCC/PA/CMA/2018/3/Add.2), 19 March 2019.
[97] Article 10 (6) PA.
[98] Technology Framework under Article 10, paragraph 4, of the Paris Agreement, Decision 15/CMA.1 (FCCC/PA/CMA/2018/3/Add.2), 19 March 2019.
[99] Paragraph 3 (b) of the Annex to Decision 15/CMA.1.
[100] Paragraph 6 of the Annex to Decision 15/CMA.1.
[101] Paragraph 21 of the Annex to Decision 15/CMA.1.

Paragraph 69 of Decision 1/CP.21 demands a periodic assessment of the effectiveness and adequacy of the support that is provided under Article 10 PA. Decision 16/CMA.1[102] regulates the scope and modalities of this assessment, which is also part of the global stocktake.[103]

7.3.1.4. Transparency and review

The NDCs are based on the states parties' self-categorisation. Given the PA's bottom-up approach, a strong mechanism to gather and review information on the implementation of each state's NDC is needed to build trust and foster long-term cooperation. The design of the provisions on transparency and review avoid any differentiation between developed and developing states. Obligations for all states are similar, while some flexibility is provided.[104] The notion of flexibility is mainly reflected in the Decision 18/CMA.1[105] that details the guidelines for the transparency framework in accordance with Article 13 (13) PA, as discussed below.

Article 13 (1) PA establishes "an enhanced transparency framework for action and support, with built-in flexibility." The notion of flexibility is a tool to address "different capabilities" of states parties.[106] Article 13 (2) PA emphasises that flexibility should be provided to developing states, related to their capacities; the modalities, procedures, and guidelines to implement the transparency framework article must reflect the notion of flexibility.[107] Article 13 PA is the only article of the PA that mentions the notion of flexibility.

Article 13 (7) PA stipulates that all parties have to submit national inventory reports about anthropogenic emissions[108] and information "necessary to track progress made" regarding the implementation and success of their NDCs.[109] The reports also include information related to the states' situation concerning climate change impact and adaptation. In addition, developed states report on the support they provided to developing states during the period in question,[110] while developing states submit information about the support that they needed and received.[111]

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[102] Scope of and Modalities for the Periodic Assessment Referred to in Paragraph 69 of Decision 1/CP.21, Decision 16/CMA.1 (FCCC/PA/CMA/2018/3/Add.2), 19 March 2019.
[103] Decision 16/CMA.1, para 4; Article 14 PA.
[104] *See*, Maljean-Dubois, Sandrine, "The Paris Agreement: A New Step in the Gradual Evolution of Differential Treatment in the Climate Regime?," *RECIEL* 25, no. 2 (2016): 158.
[105] Modalities, Procedures and Guidelines for the Transparency Framework for Action and Support Referred to in Article 13 of the Paris Agreement, Decision 18/CMA.1 (FCCC/PA/CMA/2018/3/Add.2), 19 March 2019.
[106] Article 13 (1) PA.
[107] *See* further, Article 13 (13) PA.
[108] Article 13 (7) (a) PA.
[109] Article 13 (7) (b) PA.
[110] Article 13 (8), (9) PA.
[111] Article 13 (10) PA.

Pursuant to Article 13 (11) PA, these reports undergo a technical expert review. Developing states "that need it in the light of their capacities" can obtain "assistance in identifying capacity-building needs." Furthermore, Article 13 (12) PA stipulates that the technical expert review takes into account developing states' "national capabilities and circumstances." Finally, developing states should be supported in the implementation of Article 13 PA and in building transparency-related capacities.[112]

The transparency framework is an essential precondition for the functioning of the global stocktake. Pursuant to Article 14 PA, the CMA has to regularly "take stock" of the PA's implementation and assess the "collective progress," taking into account the objective of the PA and its long-term goals. In this effort, the CMA also relies on the information that is provided as part of the transparency framework, in the sense that the collective performance of the states in terms of the overall mitigation task has to be correlated with developments at national levels. Otherwise, a global conversation about enhanced ambition and progress will remain futile.

Decision 19/CMA.1[113] details the rules that are applicable to the global stocktake. Paragraph 11 of Decision 19/CMA.1 stipulates that adequate funding should be provided in order to ensure the participation and representation of developing states "in all activities under the global stocktake." Developed states are "invited" to mobilise support for capacity-building to enable least developed states, small island developing states, and other developing states to take part in the global stocktake.[114] Information that will be considered "at a collective level" during the course of the global stocktake also contains "[b]arriers and challenges, including finance, technology and capacity-building gaps, faced by developing countries."[115]

Decision 18/CMA.1 lists the rules that govern the review process of reports that states parties submit in accordance with Article 13 PA. Pursuant to Paragraph 3 of Decision 18/CMA.1, developing states enjoy flexibility with respect to the modalities, procedures, and guidelines to implement the transparency framework. Decision 18/CMA.1 does not refer to the CBDR principle when providing differential treatment to developing states. However, it is noticeable that throughout the document flexibility is afforded to developing states "in the light of their capacities."[116]

Accordingly, the notion of flexibility guides the rules and modalities of the review process under the PA. The practical cooperation of the parties under the PA will show how parties deal with this

[112] Article 13 (14), (15) PA.
[113] Matters Relating to Article 14 of the Paris Agreement and Paragraphs 99–101 of Decision 1/CP.21, Decision 19/CMA.1 (FCCC/PA/CMA/2018/3/Add.2), 19 March 2019.
[114] Decision 19/CMA.1, para 12.
[115] Ibid., para 36 (f).
[116] Decision 18/CMA.1, paras 3 (c), 4, 5, 6, 7 (c), 25, 29, 32, 34, 35, 48, 57, 58, 85, 92, 95, 102, 159, 162, 192 (c).

new term. Flexibility could potentially emerge as an important lynchpin of international climate cooperation, mainly because it links the bottom-up element of individual states' NDCs with the international level. Parties have to submit biennial transparency reports pursuant to Article 13 (7) (a) PA. Decision 18/CMA.1 stipulates the rules for the technical review of these documents. A state's first biennial transparency report will undergo an "in-country review" and subsequently at least two biennial reports per decade will be subject to an in-country review, while one of these two reports has to contain information on the state's implementation of its NDC under Article 4 PA.[117]

The way in which states parties interpret and incorporate flexibility will be important for the credibility and accuracy of the review process and the information that is produced through the transparency framework. The application of the rules included in Decision 18/CMA.1 will show how states parties interpret and operationalise the notion of flexibility. Paragraph 6 of this decision deserves scrutiny in this regard for two reasons. First, the application of flexibility to the rules of Decision 18/CMA.1 is self-determined. States that want to apply flexibility merely have to point to capacity constraints they experience and a timeframe during which the situation is estimated to improve. Second, when developing states apply flexibility in the context of this decision "the technical expert review teams shall not review the Party's determination to apply such flexibility or whether the Party possesses the capacity to implement that specific provision without flexibility."[118] In the past, large emitters among developing states were able to avoid emissions reduction commitments under the UN climate regime by hiding behind provisions that provided forms of differential treatment. If some large emitters rely on the notion of flexibility to avoid reporting obligations, the option of utilising flexibility might become a new loophole that could potentially derail the review and stocktake process. An outcome like this would damage the foundations of the bottom-up approach.[119]

7.3.1.5. Capacity-building

Article 10 (5) PA stresses the importance of innovation for "an effective, long-term global response to climate change and promoting economic growth and sustainable development." The Technology Mechanism under the UNFCCC should provide support to developing states in accessing technology, "in particular for early stages of the technology cycle."[120] In accordance with Paragraph 6 of the

[117] Ibid., para 158 (b).
[118] Paragraph 6 of the Annex to Decision 18/CMA.1.
[119] *See* further, subsection 7.3.1.6.
[120] Article 10 (5) PA.

Annex to Decision 15/CMA.1, activities in this regard should help developing states to effectively participate in efforts to build resilience and reduce emissions.

Article 11 PA regulates how developing states can be supported in increasing their capacity and ability "to take effective climate action."[121] The second paragraph of this article describes the characteristics of capacity-building.[122] Efforts should be country-driven, attend to national needs and foster ownership of the states involved. Developing states are the primary addressees of capacity-building action.[123] Parties that help to enhance the capacities of developing states have to report on these efforts. Finally, Article 11 (4) PA stipulates that capacity-building activities have to be institutionalised. Regulations in this regard should be discussed by the CMA.

The Katowice Rulebook does not include any further decisions relating to "initial institutional arrangements for capacity-building."[124] However, states parties had already established the Paris Committee on Capacity-building during COP-21 in 2015. The aim of this committee is to "address gaps and needs, both current and emerging, in implementing capacity-building" in developing states.[125] Pursuant to Paragraph 73 of Decision 1/CP.21, a work plan for the period 2016 to 2020 was launched. Paragraph 81 of Decision 1/CP.21 stipulates that COP-25 will review the progress, need for extension, effectiveness and enhancement of the committee's work. Thus, the institutionalisation with respect to capacity-building remained work-in-progress more than three years after the adoption of the PA.

7.3.1.6. Reflecting on differentiation under the Paris Agreement

The preceding subsections described how differentiation was redefined under the UN climate regime following the adoption of the PA and the guidelines for its implementation that the Katowice Rulebook contains. The UNFCCC is the only MEA that explicitly states the CBDR principle. Chapter four showed that in international environmental law the legacy of differential treatment is more diverse and goes beyond the explicit inclusion of the CBDR principle. Indeed, differential treatment as a tool in international environmental law predates the formulation of the CBDR principle. Since the 1980s, differential treatment has evolved along efforts to achieve universal participation in MEAs that deal with global environmental problems.

[121] Article 11 (1) PA.
[122] Article 11 (2) PA.
[123] Article 11 (3) PA.
[124] Article 11 (5) PA.
[125] Decision 1/CP.21, para 71.

Differentiation generally takes into account the objective of an MEA. The KP, however, seems to disregard the objective of the UNFCCC in favour of differentiation. This subsection considers the question whether the PA is able to re-align the UN climate regime with the legacy of differential treatment in international environmental law. It argues that the restructured UN climate regime re-joins the "mainstream" of MEAs concerning the differentiation of commitments among parties.

In addition, the PA and Katowice Rulebook present an innovative approach to the operationalisation of the CBDR principle. This approach includes various forms of differential treatment, without explicitly referring to the formulation of the CBDR principle. These provision thus avoid alluding to the principle's legacy in the UN climate regime. Nevertheless, concerns remain with respect to the states parties' willingness to establish rules that are able to both regulate self-categorisation and ambitious climate action in a meaningful way. This matter will be elaborated at the end of this subsection.

Chapter four's section 4.2. explained that MEAs provide two forms of differentiation. First, MEAs entail "direct" differentiation as a form of preferential treatment available for a specific group of states. Second, contextual differentiation concerns norms that seem to treat all states identically, but the application of these norms either permits or requires the consideration of relevant national circumstances. The application of contextual norms can easily be adjusted to changing circumstances.[126]

The UN climate regime has relied on both versions of differentiation. However, in the KP a considerable group of states – all non-Annex I states – had no specific emissions reduction commitments, which arguably is the main obligation in a regime that seeks to mitigate climate change. Chapter six and section 7.2. of this chapter showed that the correlation between mitigation commitments and the operationalisation of the CBDR principle are vital features of the UN climate regime. It took about a decade of painful negotiations to correct the rigid differentiation that the Berlin Mandate had introduced.

The PA clearly includes provisions with direct differentiation. This is achieved through its bottom-up approach to mitigation commitments and a revised operationalisation of the CBDR principle that relies on self-categorisation. In fact, each state can pursue its preferred policies in order to contribute to the PA's overall objective.[127] Furthermore, Article 4 (4) PA allows developing states to delay efforts to pursue economy-wide emissions reduction or limitation targets, which

[126] *See* subsection 4.2.3.1.; see also Honkonen, 2009, 111; Magraw, 1990, 73–6.
[127] Articles 2, 4 (1) and (3) PA.

constitutes a grace period. These are examples for direct differentiation with respect to the main obligation of the parties under the PA.

There are also examples for contextual differentiation in the PA. They concern the provisions that allow for the consideration of national circumstances of developing states or make available support in the fields of technology and finance and offer assistance in capacity building.[128] These provisions seek to take into account concrete needs of developing states parties. They enable these states to contribute to the implementation of the PA, by addressing their specific weaknesses or vulnerabilities. As part of the transparency framework, these states parties alert the international community to their vulnerabilities and needs through the global stocktake.[129] Furthermore, adaptation measures, financial support, and capacity-building that aim to assist developing states parties should be "country-driven," acknowledging the specific needs of the host states.[130]

The application of differential treatment in the PA thus brings the UN climate regime's approach to modes of differentiation that conform with experiences in other MEAs. Differentiation under the PA takes into account the need to achieve universal participation in a regime that responds to the serious global threat of climate change, but not at the expense of exempting a large group of states from any commitments with respect to the core action to achieve the objective of the treaty. Therefore, the PA's approach to differentiation has the potential to foster effective participation in the protection of the environment by all states parties, in particular through its innovative operationalisation of the CBDR principle.

The notion of differential treatment is reflected throughout the provisions that regulate the elements of climate cooperation that the Durban Platform put forward, which the preceding subsections described in detail. Article 4 (2) PA, the core provision on mitigation, allows for self-categorisation, while several other provisions in this article treat developing states differently, either by mentioning the CBDR principle, adding qualifiers or pointing to the distinction between developed and developing states.

Arguably, the rejection of annex-based differentiation in implementing mitigation commitments is the most significant change that the PA brought about. In addition, the PA's revised approach offers two innovations with respect to the operationalisation of the CBDR principle. First, the operationalisation of the CBDR principle correlates with the self-categorisation of states parties, mainly concerning developed and developing states. Yet, both under the PA and the decisions of the

[128] *See*, subsections 7.3.1.1. to 7.3.1.5.
[129] Article 13 (6) , 14 PA.
[130] Articles 7 (5), 9 (3), (4), 11 (2) PA.

Katowice Rulebook further categories are available, such as least developed countries and small island developing states, in order to particularly take into account the needs of the most vulnerable states when affording differential treatment.

Second, as discussed in the preceding five subsections the CBDR principle is operationalised in different ways in the context of the components of climate cooperation – i.e. the so-called Durban components (mitigation, adaptation, finance, technology development and transfer, transparency, and capacity building). By pursuing this issue-based approach, the operationalisation of the CBDR under the PA displays a much more pragmatic point of departure.[131]

In addition to the operationalisation of the CBDR principle in the specific contexts of the Durban components, the PA also offers a certain fluidity within the mitigation component. The scope of NDCs under Article 4 (4) PA varies. As already mentioned, developed states are expected to undertake "economy-wide absolute emission reduction targets," while developing states increase their mitigation efforts and "move over time towards economy-wide emission reduction or limitation targets, in the light of different national circumstances." The global trend towards decarbonisation justifies the expectation that developing states' domestic policies will gradually align with this trend. Thus, their commitments under the PA can be expected to change over time. The states decide when they will shift to economy-wide emissions reduction targets.

Accordingly, this provision contains a very nuanced form of differentiation.[132] The mitigation component not only offers self-categorisation and thus sovereign decision-making with respect to the initial scope of mitigation action. It also leaves it to the developing states to determine when their economy is "ready" to start economy-wide emission reductions. Hence, the PA improves the operationalisation of the CBDR principle through its specific application to the Durban components. It provides differential treatment in different areas of climate action that create the basis for meaningful climate cooperation. The states parties' practice to implement their NDCs, the review procedures, and possibly further negotiations will have to show how this broad approach to differentiation relates to the substantive objectives and the concepts of ambition and progression.

Prior to the adoption of the Katowice Rulebook, however, trust-building and the consolidation of international cooperation under the PA were marred by renewed contestation over the interpretation of the CBDR principle during the negotiation of the modalities, procedures, and guidelines to implement the PA. Instances of contestation were tangible during the climate talks in

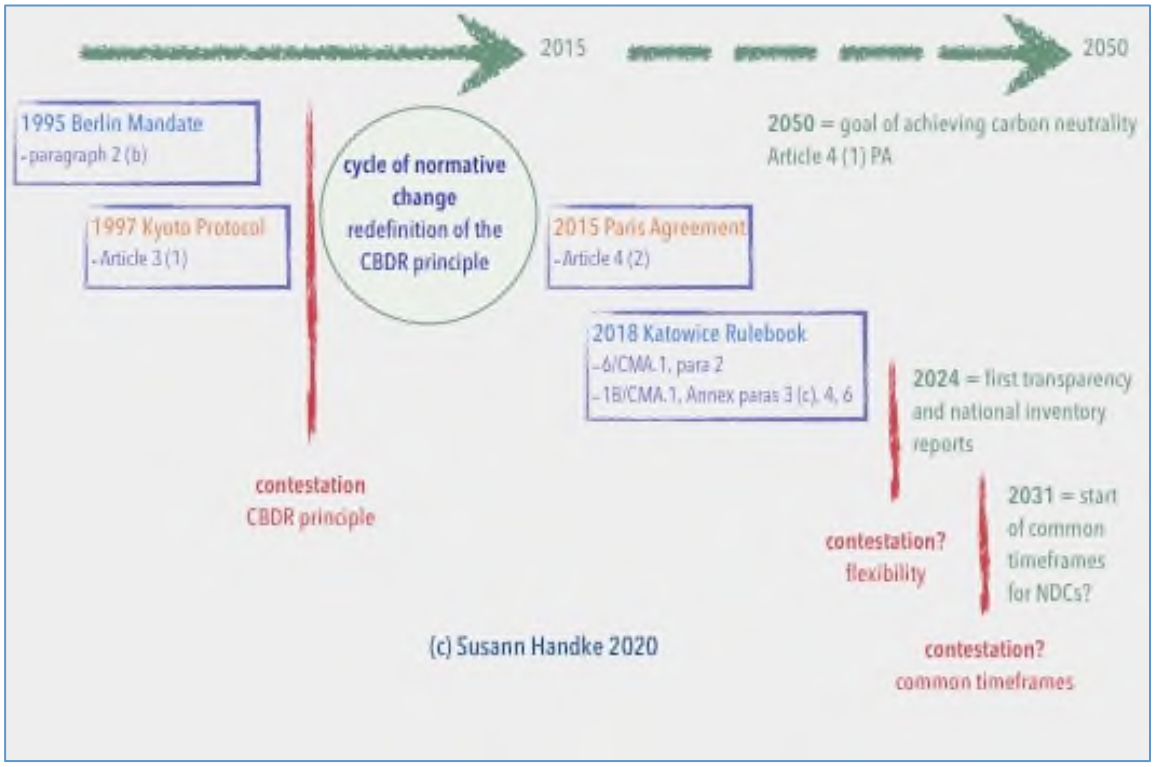
[131] Lavanya Rajamani concludes that by tailoring the CBDR principle to the specificities of the Durban components differentiation shifted "from an ideological to a pragmatic basis." *See*, Rajamani, 2016, 509.

[132] *See* also, Winkler, Harald, "Mitigation (Article 4)," in *The Paris Agreement on Climate Change: Analysis and Commentary*, ed. Daniel Klein, María Pía Carazo, Meinhard Doelle, Jane Bulmer, and Andrew Higham (Oxford: Oxford University Press, 2017), 151–2.

Bangkok in September 2018 that were held in preparation of COP-24 in Katowice in December of that year. The main conflict at that time concerned the question of whether the rules on NDCs should be applicable to all parties or be differentiated for developing and developed states. China proposed a two-tier rulebook in which some rules would only be applicable to developed states. This proposal was rejected by the EU and blocked by the U.S.[133]

The rules that regulate the implementation of the PA can have a big impact on substantive matters of international cooperation to mitigate climate change. The brief examination of differentiation regarding the Durban components and the operationalisation of the CBDR principle in the decisions of the Katowice Rulebook revealed that differentiation-inspired contestation is shifting to more specific technical norms. Contestation in this context can sow distrust or delay urgently needed climate action. The issues of common timeframes for NDCs[134] and the notion of flexibility in Article 13 PA[135] are cases in point (see figure 7.3).

Figure 7.3: Correlation between the CBDR principle and mitigation action



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[133] Timperley, Jocelyn, "Bangkok Climate Talks: Key Outcomes on the Paris Agreement 'Rulebook'," 10 September 2018, https://www.carbonbrief.org/bangkok-climate-talks-key-outcomes-on-the-paris-agreement-rulebook.
[134] *See*, subsection 7.3.1.1.
[135] *See*, subsection 7.3.1.4.

Both the delay in implementing common timeframes and the suggested flexibility regarding transparency obligations have the potential to severely hamper international climate cooperation. No doubt, as long as the decarbonisation of energy generation is in line with national policies and societal preferences most states will proceed and implement mitigation measures. However, as soon as protests occur and further progression in a state's NDCs would involve painful socio-economic decisions, most states will probably grow more reluctant to proceed – even more so, if other states, in particular large emitters, allow themselves longer timeframes for implementing their NDCs or tend to fulfil transparency obligations with great flexibility.

In fact, with the notion of flexibility the PA and Katowice Rulebook entered a grey area and moves away from terms that allude to differentiation in international environmental law. This choice has the potential to lead to prolonged conflicts and misunderstandings. The redefinition of the CBDR principle was an important catalyst for the bottom-up reconstruction of the UN climate regime. However, meaningful cooperation on climate change mitigation through NDCs, based on self-categorisation, depends on credible assurances that each state's contribution is well-documented and traceable. The next decade will show whether the PA, together with the Katowice Rulebook, will be able to foster international climate action or whether issues such as common timeframes and the notion of flexibility will lead to new instances of contestation and normative change.

7.3.2. Reconciliation

The previous subsection explored the main provisions of the PA that concern the way in which this treaty and the Katowice Rulebook seek to manage international climate action and differentiate commitments in order to take into account vulnerabilities of weaker states. This subsection continues the analysis and examines the PA's legality, based on the interactional theory of international law that Brunnée and Toope have developed.[136] It answers the fourth sub-question that helps to guide the reasoning that this dissertation presents:

> 4. *Can the bottom-up reconstruction of the UN climate regime help fulfil Fuller's criteria of* ***legality****, as applied to international law by Brunnée and Toope?*

[136] Subsections 2.4.2. of chapter two and 4.3.3. of chapter four have already summarised the main line of reasoning that this theory follows and highlighted its application to the UN climate regime.

This subsection considers how the bottom-up reconstruction contributes to the development of the UN climate regime. It argues that the reconstructed UN climate regime conveys a level of procedural and substantive legality that is conducive to creating a sense of legal obligation among the parties, regarding states parties' commitments to mitigate climate change and the provision of differential treatment to parties that need it. However, the rules of the Katowice Rulebook that guide the implementation of the PA have the potential for diminishing this achievement. The following analysis, based on Brunnée and Toope's interactional theory, considers both instruments. It shows that the guidelines on mitigation cooperation that the Katowice Rulebook contains are hardly able to enhance the level of legality. Much will depend on the interaction of the states parties in the context of the global stocktake that Article 14 PA establishes and which will be conducted every five years from 2023 onwards.

Chapter two explained the theoretical approach that Brunnée and Toope developed; and chapter four summarised their assessment regarding the legality of the UNFCCC and KP. This summary also included an examination of the CBDR principle's operationalisation in the UN climate regime.[137] Brunnée and Toope base their interactional theory on Fuller's eight criteria of legality (promulgation, generality, clarity, non-retroactivity, non-impossibility of performance, non-contradiction, constancy, and congruence between practice and the law).

These criteria form the building blocks of one of three elements that characterise legal norms with obligatory force. The gist of Brunnée and Toope's interactional theory of international law is that, in order to convey a sense of legal obligation, legal norms must be based on shared understandings, meet the criteria of legality, and prevail in a practice of legality.[138] Of course, for the third element that is needed to foster legal obligation, the parties' interaction from 2023 onwards[139] will require further study. The analysis of this subsection merely constitutes an initial assessment and is limited to the criteria of legality. Nevertheless, it highlights several issues that, if not addressed, could seriously harm climate cooperation under the PA and Katowice Rulebook.

Inspired by the analysis that Brunnée and Toope presented by applying Fuller's criteria, this subsection conducts a similar assessment of the PA and considers the PA's reversed approach to mitigation and the refined CBDR principle. This examination is worthwhile, as it helps to understand how the rules on mitigation and the operationalisation of the CBDR principle under the PA are able to

[137] *Cf*. the assessment of differentiation under the KP in subsection 4.3.3.
[138] Brunnée and Toope, 2010, 129–30.
[139] In 2023, the first global stocktake will take place in order to consider the first results of the parties' implementation of their NDCs and their collective achievement.

generate "lasting obligatory force."[140] As Brunnée and Toope emphasise, an agreement that exhibits this trait "rests on a strong foundation of shared understandings, respects the requirements of legality, and is embedded in a vibrant practice of legality."[141]

By pursuing this approach, the analysis follows the storylines of this dissertation – decarbonisation and differentiation. Thus, subsection 7.3.2.1. scrutinises whether the PA's approach to climate change mitigation fulfils Fuller's eight criteria and whether these norms of the PA can form a durable basis for meaningful international climate cooperation. Then, subsection 7.3.2.2. explores how the bottom-up approach influences the legality of the main provisions that concern mitigation action and operationalise the CBDR principle. The examination of the CBDR principle's operationalisation covers the different forms of differential treatment, while the first part of the analysis focuses on Article 4 PA and Decision 4/CMA.1 of the Katowice Rulebook, which, taken together, stipulate the main provisions on climate change mitigation.

7.3.2.1. Thicker substantive legality

The UN climate regime's legality evolved with every major treaty. The UNFCCC meets Fuller's criteria of legality, which contributes to the convention's resilience.[142] However, this treaty mainly contains procedural provisions and subsidiary rules.[143] The UNFCCC hardly fulfils the requirements of interactional law concerning the parties' substantive commitments.[144] Therefore, the regime needed a protocol that – within the established procedural rules – is able to both further develop the framework for climate cooperation and produce thicker substantive provisions.

With the KP's entry into force, the maturing phase of the UN climate regime began. The adoption of the UNFCCC initiated the development of the UN climate regime. This step revealed a strong shared understanding that efforts to address the causes and consequences of climate change were vital for humankind's survival. However, even in 1997, when the KP was adopted, few people fathomed the magnitude of the task that lay ahead. Therefore, both the UNFCCC and KP merely provided initial rules that commenced and institutionalised international climate cooperation. The KP's limitations eventually became obvious when parties tried to honour their commitments from 2008 onwards, while global greenhouse gas emissions kept rising, mainly originating from states that

[140] Brunnée and Toope, 2010, 217.
[141] Ibid.
[142] Ibid., 177–8.
[143] Ibid., 181.
[144] Ibid., 184.

had no emissions reduction obligations. These insufficiencies necessitated the negotiation of a new treaty and a reconsideration of the Kyoto approach.

Brunnée and Toope assess the KP's legality and conclude that the KP only presents a "mixed picture" when testing all eight criteria.[145] In fact, the KP fails to meet several criteria of legality. After its entry into force, the states parties' evolving shared understanding of mitigating climate change was increasingly at odds with the KP's modalities of emissions reduction. Indeed, its rules on emissions reduction did not meet the criteria of generality, non-contradiction, and non-impossibility of performance.[146] The provisions on emissions reduction were mainly shaped by the Protocol's rigid differentiation.[147] Over time, the Protocol's approach to differentiation negatively affected the level of legality that it conveyed. This interrelationship stresses the importance of considering the UN climate regime's legality concerning its approach to both mitigation action and differentiation.

As mentioned above, Brunnée and Toope concluded that, given the parties' focus on procedural issues, substantive elements remained "works in progress," mainly because "the stock of substantive understandings" among the parties to the UN climate regime was "relatively lean."[148] These substantive understandings evolved during the first decade of the 21st century and influenced negotiations of a the new treaty. Therefore, it is appropriate to ask whether the level of legality, which the PA's substantive provisions convey, matches the regime's procedural achievements.

The preceding sections showed that the parties were cognisant of the misperceptions that were responsible for the deficient Kyoto approach to climate change mitigation when they adopted the PA. Furthermore, they were much more aware of the enormous task and the long-term commitments that meaningful climate action would involve. Thus, it is warranted to examine how both the PA's reversed approach to mitigation and the refined CBDR principle contribute to substantive aspects of the regime's legality.

The criteria of legality are assessed in the following order: promulgation, generality, non-retroactivity, non-contradiction, constancy, congruence between rule and practice, non-impossibility, and clarity. Under the Paris approach, international cooperation to reduce greenhouse gas emissions is regulated in Article 4 PA and Decision 4/CMA.1 of the Katowice Rulebook. Where possible, the

[145] Brunnée and Toope, 2010, 189.
[146] Ibid., 190.
[147] *Cf*. Brunnée and Toope, 2010, 187–90.
[148] Ibid., 176, 17.

focus is on Article 4 PA when assessing the legality of norms that regulate mitigation action.[149] The 19 paragraphs of this article regulate the cooperation of the states parties on climate change mitigation.

Both the PA and Decision 4/CMA.1 were adopted in accordance with the procedural rules of the UN climate regime.[150] Article 4 PA and Decision 4/CMA.1 thus meet the criterion of promulgation.[151] Article 4 (2) and (3) PA stipulate the obligation of "each party" to "prepare, communicate and maintain" successive nationally determined contributions that point to a progression in comparison with the previous submission. Given that this central commitment of the PA applies to all parties, Article 4 PA meets the criterion of generality. The fact that Article 4 PA fulfils the criterion of generality clearly distinguishes the mitigation provisions under the PA from the previous Kyoto approach.

Indeed, obliging all parties to submit NDCs, which lay out how the parties plan to reduce emissions, is a logical consequence of the debate about more ambitious climate action. Since this debate began at the time when the KP entered into force, the idea of having all parties accept mitigation commitments had been gaining more momentum among the parties and resulted in the PA.

The PA's provisions that concern mitigation action are not retroactive. Decision 1/CP.19 "invited" the parties to submit their first NDCs until the first quarter of 2015.[152] The PA only includes provisions that deal with successive NDCs. Thus, the PA fulfils the criterion of non-retroactivity. It also fulfils the criterion of non-contradiction, as the parties are not obliged to commit to or continue to pursue other mitigation tasks. The second commitment period of the KP ended in 2020. At that time, mitigation action under the PA should commence.[153] Thus, states parties have to start implementing their NDCs. This arrangement avoids contradictions within the UN climate regime that could result from the transition from the Kyoto system of emissions reduction targets to NDCs.

The rules concerning the submission of the NDCs and its administration are predictable. Pursuant to Article 4 (9) PA, each party must communicate an updated NDC every five years. The

[149] Chapter six discussed in subsection 6.4.3. the revised approach to climate change mitigation. The main provision in this regard is Article 4 PA.

[150] The adoption of decisions under the UNFCCC is guided by draft rules that are "applied" by the COP and subsidiary bodies, although there is still disagreement about the provision of voting. Pursuant to Article 16 (5) PA, these draft rules also apply to decisions adopted by the conference of parties serving as the meeting of the parties to the Paris Agreement. *See*, Organizational Matters Adoption of the Rules of Procedure, Document (FCCC/CP/1996/2), 22 May 1996, para 2; Rules of Procedure of the Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement, Decision 2/CMA.1 (FCCC/PA/CMA/2016/3/Add.1), 31 January 2017.

[151] The importance of this criterion can be illustrated by the fate of the Copenhagen Accord, a major document that was presented during one of the COPs. The Copenhagen Accord entailed various substantive innovations, some of which inspired the draft of the PA. However, this document was only considered a political agreement, as it was not adopted by consensus of all parties. Thus, it remained outside the UN climate regime.

[152] *See*, Decision 1/CP.19, para 2 (b).

[153] *See*, Decision 1/CP.19, para 2.

Paragraphs 22 to 35 of Decision 1/CP.21 detail the mitigation commitments that the parties have with respect to the submission of information required for the review procedures. Annex I of Decision 4/CMA.1 provides further guidance concerning the content and format of how this information should be submitted.

Compared to the emissions reduction targets that were negotiated under the KP, the parties have much more control of how they design their commitments. To ensure trustful cooperation, the PA establishes a transparency framework.[154] Article 13 (7) PA lists the information that is expected from the parties about their greenhouse gas emissions and the implementation of their NDCs. In addition, some form of coordination is needed. Beginning in 2023, the global stocktake will assess the "collective progress" every five years.[155] Its outcome must inform the process of updating the NDCs.[156] The parties also have to include information of how their preparation of the follow-up NDCs were informed by the outcomes of the global stocktake.[157] These provisions structure the process of developing and updating the substantive content of the NDCs in a predictable way. Thus, the PA and Decision 4/CMA.1 fulfil the criterion of constancy.

However, the unsolved issue of the common timeframes that the parties' NDCs cover weakens the constancy that the mitigation obligations of the parties convey. As already mentioned in subsection 7.3.1.1., common timeframes will only be applied from 2031 onwards – if, by then, parties will be able to agree on the length of these common timeframes. This creates a considerable degree of unpredictability. The disagreement about this issue generally sows doubt among the parties about the sincerity and reliability of the intended cooperation. In more specific terms, this situation creates uncertainty regarding the national planning processes of the parties, mainly because throughout the 2020s the governments will not know in which frequency NDCs will have to be updated during the next decade, beginning in 2031. This results in inconsistency and prevents the steady development of "best practices" that can inform the design of NDCs by other parties.

The criterion of congruence between practice and required behaviour under Article 4 PA will be fulfilled as long as the states parties submit their national energy and climate policies as NDCs and carry on with the implementation of these policies. Finally, the bottom-up approach to mitigation action contributes to a high level of congruence with international practice, since the parties submit their climate and energy policies as NDCs. Most of these submissions concern policies that were already being implemented when the first NDCs were submitted. Thus, Article 4 PA meets the criteria

[154] Article 13 (1) PA.
[155] Article 14 (2) PA.
[156] Article 14 (3) PA.
[157] Paragraph 4 (b) of Annex I of Decision 4/CMA.1.

of legality. Whether these mitigation rules will be able to convey "lasting obligatory force," will to a large degree depend on the modalities, procedures, and guidelines that the Katowice Rulebook prescribes.

One aspect of the PA's design and the wording of some provisions[158] needs to be mentioned in this context. The practice of national governments in implementing the NDCs will interact with the international level through the global stocktake. Pursuant to Article 14 (1) PA, this instrument will assess the "collective progress" from 2023 onwards. In this forum, the states parties will discuss the global emissions situation and the progress of national policies.

This interaction will be vital for the formation of new ideational concepts and the refinement of evolving imaginaries of possible energy futures. In interactional processes, language and a common terminology play a crucial role. Adhering to the phrase "long-term low greenhouse gas emission development"[159] will definitely divert attention from the foremost task of decarbonising energy generation. Although all greenhouse gases that the UNFCCC covers have to be taken into account, the reduction of CO_2 has emerged as the most important element of climate change mitigation. A practice of legality will hardly emerge when legal norms blur the shared understanding of the task that they seek to regulate. The practice under the PA will show whether Article 4 PA will be able to fulfil the congruence criterion.

One of the PA's most significant characteristics is the bottom-up approach to mitigation action. The parties did not create an impartial body. Neither did they establish far-reaching compliance procedures that would facilitate the enforcement of the parties' commitments in a top-down manner. Instead, the substantive progress of the regime relies on the parties' adherence to their self-chosen contributions. The success of their cooperation is realised "on the ground" – i.e. at the local and sub-national levels. The parties need to show some form of proof how decarbonisation measures are part of their overall economic trajectory. In other words, they need to "own" this process and increasingly internalise and substantialise these measures, as subsection 5.4.2. illustrated. Therefore, the congruence between the parties' practice and behaviour agreed in both the PA and Katowice Rulebook needs to be assessed from this national perspective. Lofty declarations by state officials are insufficient to fulfil the congruence criterion.

[158] Articles 2 (1) (b), (c), 4 (19) PA.
[159] Article 4 (19) PA.

This shifts the focus to the consequences of two probable developments that concern the congruence criterion. These developments relate to the withdrawal of a state party from the PA[160] and a state party's temporary suspension of its efforts to implement its NDC. Neither of these possible disruptions to international climate cooperation under the PA is unlikely, mainly because the nature of the bottom-up structure depends on a broad framework of national policies and ongoing political support to uphold this framework. First, a withdrawal could result from a change in government and a reconsideration of national economic and energy policies. Second, a suspension of implementation efforts – either officially declared or tacitly administered – is almost unavoidable, given the complexity of altering the energy supply of an entire economy. Moreover, decarbonisation measures will certainly be postponed following the impact of natural disasters or economic crises.

In both cases, the congruence between practice and required behaviour as a criterion to judge the substantive legality of the PA needs to take into account the national circumstances under which a withdrawal or suspension occurs. Given that the PA envisages a long-term process and progression in states parties' NDCs, actions that states parties take in either of these two situations need to be evaluated from a long-term perspective. The congruence criterion should be tested by asking a straightforward question: Would a withdrawal/suspension derail climate cooperation at *a later stage* – i.e. the moment when the reason for withdrawal/suspension will have been resolved?

To assess the situation, relevant developments in the case of a withdrawal would be the *effective* implementation of appropriate subnational policy measures, while in the case of a suspension the continuing *political* support for national decarbonisation policies would be an important factor. Accordingly, it would be possible that in the future the state party in question can officially re-join international climate mitigation efforts (withdrawal scenario) or effectively continue implementing its mitigation efforts (suspension scenario).

The discussion of differentiation and decarbonisation in this dissertation provides two arguments that support this reading of the congruence criterion. Both arguments derive from the analysis of the concepts of differentiation and decarbonisation that was presented in this dissertation. First, the reformulation of the CBDR principle as well as the original motive for providing differential treatment in MEAs justify this reasoning. The reformulation of the CBDR principle allows the states parties to broadly consider national circumstances both in determining their own commitments and in judging other parties' efforts. It thus equips the cooperation process with a language to appraise national conditions.

[160] *See*, section 8.2. in chapter eight for a brief discussion of the withdrawal of the U.S. from the PA that the Trump administration submitted in November 2019, following a campaign promise to reconsider federal climate and energy policies.

Furthermore, the UNFCCC, as an MEA, is based on the notion that achieving universal participation in efforts to address a global environmental problem is preferable. This comes with an inherent reluctance to expel states from the ongoing cooperation process too soon. Rather, states parties need to be given some wiggle room in order to have as many states as possible continuously contributing to the mitigation of climate change.

Second, this dissertation described the decarbonisation of energy generation as a governed fuel transition.[161] Instead of considering the bottom-up structure as a weakness of the PA, this characteristic can help to foster the substantive legality of the UN climate regime, as long as the parties are willing to acknowledge the room for manoeuvre, which the bottom-up structure provides, in a forward-looking way. The global stocktake – in the sense that it considers the global emissions situation and measures to combat climate change – can serve as a forum to engage and continue the debate about the governance of decarbonisation, even if some states parties' efforts to fulfil their commitments are in doubt. In any case, the parties' reaction to instances of withdrawal and suspension will be evolving. Given the implied consequences, they will be loath to challenge the substantive legality of the PA. An example is the response of the parties to the withdrawal of the U.S. from the PA that section 8.2. in chapter eight puts into context.

The criterion of non-impossibility of performance demands that the fulfilment of norms must be possible. It can be expected that states parties will submit NDCs that they can implement in the period of time they set for these contributions. Successive, more ambitious NDCs will also take into account the ability of the parties to implement their policies. From this perspective, the performance will not be impossible.

However, Article 4 (1) PA stipulates a broader collective goal of achieving "global peaking of greenhouse gas emissions as soon as possible" and "a balance between anthropogenic emissions by source and removals by sinks of greenhouse gases in the second half of this century." This foggy formulation hides the task of first ending the process of ever increasing emissions and subsequently realising carbon neutrality soon after 2050.

The latter goal will thus have to be reached within three decades of commencing the cooperation under the PA. The substantive content of this provision seems to be impossible to achieve, mainly because the complete carbon neutrality of the global economy points to an end of the fossil economy. At the moment when this provision was adopted, no alternative economic idea had surfaced and was accepted as a shared understanding among the parties that could underpin this

[161] *See*, subsection 5.2.2.

goal and provide guidance for the emergence of norms, in order to pave the way for a future in a carbon-neutral world. Thus, in order to avoid rendering the task of achieving mid-century carbon neutrality impossible, shared understandings would need to evolve very fast. Until this moment, the criterion of non-impossibility of performance is not fulfilled.

The final criterion of this assessment is clarity, which means that parties need to understand both the procedural and substantive content of the norm. The norms stated in Article 4 PA with respect to the submission of NDCs seem to be sufficiently understandable. A challenge could arise from the interaction between the design of NDCs and the procedures that the PA establishes to guarantee transparency and an orderly review process. Article 4 (9) PA sets forth the relevance for the global stocktake for the continued improvement of the parties' NDCs. Indeed, for the functioning of the global stocktake sufficiently clear rules with respect to transparency are needed.

As already discussed, Article 13 PA introduces the notion of flexibility with respect to the implementation of the transparency framework. This concept is not further elaborated. Decision 18/CMA.1 also fails to provide a definition and delineation of its scope. The term flexibility thus co-exists with the CBDR principle, tasked with facilitating developing states' participation in international climate cooperation. However, it does not allude to the legacy of differential treatment in international environmental law or refer to the refined interpretation of the CBDR principle under the PA.

Accordingly, for a vital aspect of the cooperation under the PA – the norms that govern the submission of information and review of NDCs – the procedural and substantive context is not clear. Developing states would not know when they can rely on flexibility and how this notion facilitates their participation in the transparency framework and review process, while developed states can hardly know what level of cooperation they can expect from developing states when these states choose to demand flexibility. No doubt, Article 13 PA interacts with the mitigation task of Article 4 PA in a crucial way. As long as the parties cannot define the scope of flexibility, a vital part of the design of the PA remains unclear, regarding the parties' procedural and substantive obligations. Thus, the clarity criterion with respect to the regulation of the transparency framework and process to review the NDCs is not fulfilled.

To sum up, the bottom-up reconstruction of the UN climate regime with all parties undertaking mitigation commitments strengthens the regime's obligatory force. The rules of the PA's mitigation provisions "thicken" its substantive legality. However, when applying the interactional theory to assess the legality of the PA's provisions, together with guidelines of the Katowice Rulebook, several

weaknesses come to light. The global stocktake will give the parties the opportunity of addressing some of these problems. Indeed, the institutionalisation of the global stocktake opens up an interactional space that enables sustained mutual engagement regarding procedural obligations that parties have when submitting their NDCs. It also facilitates an exchange on substantive matters that concern practical aspects of climate action. Above all, the parties will need to use this interactional space wisely in order to improve the substantive content of their cooperation; and they will definitely need to develop a certain awareness of the flaws in the procedures of the Katowice Rulebook. Dealing with these considerable insufficiencies will need time, while the clock is ticking towards the carbon-neutrality goal set for the second half of this century.

7.3.2.2. Flexible differentiation?

The Annex-based differentiation under the KP was regarded as too rigid. Eventually, it rendered the cooperation under this Protocol ineffective. Growing emissions from developing states with large economies outpaced successes by developed states in reducing global greenhouse gas emissions. In their assessment of the CBDR principle under the KP, Brunnée and Toope therefore conclude that the principle's operationalisation and its meaning were increasingly lacking congruence.[162]

The following examination tests whether the operationalisation of the CBDR principle under the PA meets Fuller's legality criteria. This examination benefits from the analysis presented in the previous subsections 7.3.1.1. to 7.3.1.5. that considered the PA's approach to differentiation and its operationalisation of the CBDR principle. This subsection applies the criteria of legality in the following order: promulgation, generality, non-retroactivity, constancy, non-impossibility, clarity, congruence between rule and practice, and non-contradiction.

The consideration of the CBDR principle's role in MEAs showed that, given its role as a principle, it evolves with the development of the respective regime and continues to inform the negotiation and norm-making processes.[163] During the maturing phase of a regime's development, substantive matters receive more attention, while procedural issues have already been addressed. The UN climate regime struggled with the operationalisation of the CBDR principle regarding emissions reduction obligations.

[162] Brunnée and Toope, 2010, 193.
[163] *See*, subsection 4.2.3.3. that describes the respective roles that the CBDR plays in the initial negotiation, the implementation, and the maturing phases.

The assessment of the legality of the CBDR principle in the UN climate regime, which Brunnée and Toope present,[164] reflects the rigid differentiation that applied to the KP. With difficulty, they navigate the eight criteria of legality. Most of the criteria were not met. Indeed, the low level of legality that the principle related to provisions on substantive matters achieved points to the reason why the KP's operationalisation of the CBDR principle was contested. Increasing greenhouse gas emissions originating from developing states that did not have any emissions reduction commitments caused the KP to be considered incongruent with the CBDR principle.[165] The contestation described in section 7.2. attests to an evolving shared understanding that led to a redefinition of the CBDR principle under the PA.

Article 2 (2) PA stipulates that the PA will be implemented to "reflect" the "principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances." As mentioned in subsection 7.3.2.1., the PA was adopted in accordance with the procedural rules of the UNFCCC. The criterion of promulgation is therefore met. The CBDR principle's inclusion in the PA facilitates a universal participation in the regime. Its inclusion was widely supported by developing states, while its operationalisation in the PA helps developing states to take part in cooperative climate action, as the principle sets forth the conditions under which differentiation is available, albeit in broad terms. These concern the capabilities of a party and its national circumstances. These conditions are generally applicable. The principle thus meets the criterion of generality. Each party is allowed to self-categorise and determine the scope of its commitment.[166]

The CBDR principle is not applied retroactively. Indeed, the notion of historical responsibility of developed states for climate change shaped the debate to a large degree in the past. Yet, no agreement was reached with regard to the question of how historical contributions to climate change should determine states parties' legal obligations under the UN climate regime. Generally, the UN climate regime suffices the demands uttered in this debate by expecting developed states to take the lead in combating climate change.

The PA continues this path and alludes to the necessity that developed states take the lead in pursuing "sustainable lifestyles and sustainable patterns of consumption and production," by "undertaking economy-wide absolute emission reduction targets," and in "mobilizing climate

[164] *See*, Brunnée and Toope, 2010, 190–4.
[165] Brunnée and Toope, 2010, 193.
[166] *See* also below on the criterion of clarity in this regard.

finance."[167] In addition, with the changing context of tremendously rising greenhouse gas emissions in a number of developing states the issue of historical responsibility has become less prominent. Thus, the CBDR principle in the PA fulfils the non-retroactivity criterion.

The formulation of the CBDR principle includes the notion of "respective capabilities" that should be considered "in the light of different national circumstances." This reformulation of the principle needs to be examined in the context of the demand that "all Parties are to undertake and communicate ambitious efforts" regarding climate change mitigation and adaption as well as their contribution to the transparency framework.[168] Thus, the predictability of each parties' obligations is related to the notion of ambition and progression of successive NDCs, as stated in Article 4 (3) PA. The CBDR principle is predictable in the sense that all parties self-categorise and determine the initial scope of their commitments, knowing that in the next round their efforts have to be enhanced. It thus fulfils the constancy criterion.

The operationalisation of the CBDR principle throughout the PA allows for self-categorisation and self-determination of obligations. In this sense, all parties will be able to fulfil the contributions that they have submitted as NDCs. However, this criterion also needs to be considered in conjunction with the objectives of the PA – i.e. the 2°C threshold of Article 2 (1) (a) PA and carbon-neutrality as described in Article 4 (1) PA. Achieving these goals will become impossible if cooperation among states parties proves insufficient or developing states with large economies only make very modest contributions.[169] Thus, the differentiation that the redefined CBDR principle allows might render cooperation under the PA impossible.

The criterion of clarity demands that parties must understand the content of the rule. The reformulated CBDR principle clearly relates differentiation to national circumstances. Read together with the demand to submit nationally determined contributions, it is evident that all parties submit their own policies based on national priorities. In addition, the legacy of the CBDR principle in the UN climate regime reveals that this principle was primarily intended to take into account special needs and circumstances of developing states. Therefore, self-categorisation that results in more modest mitigation contributions and requests for assistance with respect to adaptation measures, finance, technology transfer, and capacity-building will remain reserved for poorer developing states, while

[167] *See*, preambular paragraph 16 and Articles 4 (4) and 9 (3) PA.
[168] Articles 3 (1) PA.
[169] In 2012, China's annual CO_2 emissions reached 9.63 billion tonnes. From this year onwards, the amount of its annual emissions was larger that those of the EU (EU-28) and the United States combined that emitted 3.75 billion tonnes and 5.37 billion tonnes, respectively, in 2012. By then, the EU had been reducing its annual emissions for several years, while those of the United States began to decline after having peaked around 2006. *See* for various interactive charts, Ritchie, Hannah, and Max Roser, "CO_2 and Greenhouse Gas Emissions," October 2018, https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions.

the notion of "taking the lead," based on the regime's legacy, also contextualises developed states' self-chosen contributions. In this regard, the principle is sufficiently clear. However, comparisons between states' efforts that self-categorise as belonging to roughly the same groupings will be blurred if the issue of common timeframes remains unsolved. Thus, the criterion of clarity with respect to the CBDR principle also depends on the regulation of related modalities.

The congruence between the reformulated CBDR principle and parties' practice will depend on how the cooperation under the PA will evolve. The above-mentioned example of an attempt to introduce a two-tier rulebook suggests that states parties will continue to evoke the principle in order to prevent the international community to move towards more ambitious rules or achieve more preferential terms. It is of paramount importance that all parties have mitigation commitments, while differential treatment is available to those states that need it. The cooperation among parties from 2020 onwards will show whether the CBDR principle is able to inspire a meaningful application of the rules included in the PA and Katowice Rulebook that regulate the substantive components of the congruence criterion.

The non-contradiction criterion might potentially cause the main harm to the legality of the CBDR principle. As already mentioned, Article 13 PA that regulates the cooperation in the transparency framework, which is a vital element of the review and global stocktake proceedings, allows for some form of "flexibility" in fulfilling the obligations under this framework. It remains to be seen how parties deal with the notion of flexibility. In fact, it creates a parallel track for justifying a differentiated application of rules. However, neither the PA nor Decision 18/CMA.1 define the notion of flexibility. The situation might potentially inspire developing states with large economies to invoke the notion of flexibility in applying reporting rules when relying on differential treatment no longer seems justified in the light of national circumstances. This will inevitably lead to a contradictory application of the CBDR principle and the notion of flexibility. It will diminish the CBDR principle's legality and invalidate its redefinition after the cycle of normative change.

To sum up, compared to the principle's operationalisation under the KP the level of the CBDR principle's legality increased, in particular in relation to substantive provisions. Its operationalisation in the PA and the decisions of the Katowice Rulebook generally reconcile the UN climate regime with the legacy of differential treatment in international environmental law. However, modalities that remain unresolved or unclear, such as the issues of common timeframes for NDCs and flexibility with regard to reporting obligations, have the potential to negatively affect the principle's legality in the

future. In the current maturing phase of the UN climate regime's evolution, substantive aspects of the regime's legality are vital for fostering a long-term obligatory force.

Accordingly, this analysis examined the level of legality that was achieved prior to the enactment of climate cooperation under the PA. The legality of substantive mitigation provisions improved considerably compared to the Kyoto approach and so did the legality of the CBDR principle in its refined form. However, the regime's substantive legality still lags behind its procedural legality. Furthermore, this subsection showed that differentiation-inspired contestation is moving from treaty provisions to the modalities that guide their implementation. This is of particular relevance to the legality analysis; and it proves that the legality of the CBDR principle, especially regarding its operationalisation related to substantive norms, remains work in progress.

7.4. Reconstituting cooperation under the UN climate regime

The PA reverses the UN climate regime's approach to mitigation commitments from a top-down to a bottom-up target setting. Section 6.3. of chapter six described this process; and the preceding section 7.3. examined how the PA seeks to structure the cooperation of all parties by pursuing an innovative approach to differentiation. Section 7.3. focused on the Durban components of climate action – mitigation, adaptation, finance, technology transfer, and capacity-building. These are the main tasks that the states parties will have to undertake in order to implement the PA. A meaningful engagement with the Durban components thus constitutes what has to be understood as international climate cooperation.

Given the PA's bottom-up approach to mitigation, much will depend on the parties' NDCs to make the UN climate regime work. As mentioned above, this change was closely linked to a refined interpretation of the CBDR principle that now explicitly includes a state party's overall national conditions as qualifier for self-assessing the scope of this party's contributions. When designing and submitting its NDC, each party inevitably considers its domestic situation. However, it should also take into account the objective of the UNFCCC and the need to enhance the ambition of global mitigation efforts. Therefore, the PA intrinsically links the national sphere of energy and climate policymaking with the global regime.

Chapter four described the evolution of differential treatment as a vital concept in international environmental law. The reconstruction of the UN climate regime and the PA's redefinition of the CBDR principle thus justify an examination of how this transformation contributes to global

environmental governance. Accordingly, this section seeks to answer the fifth and final sub-question of this dissertation:

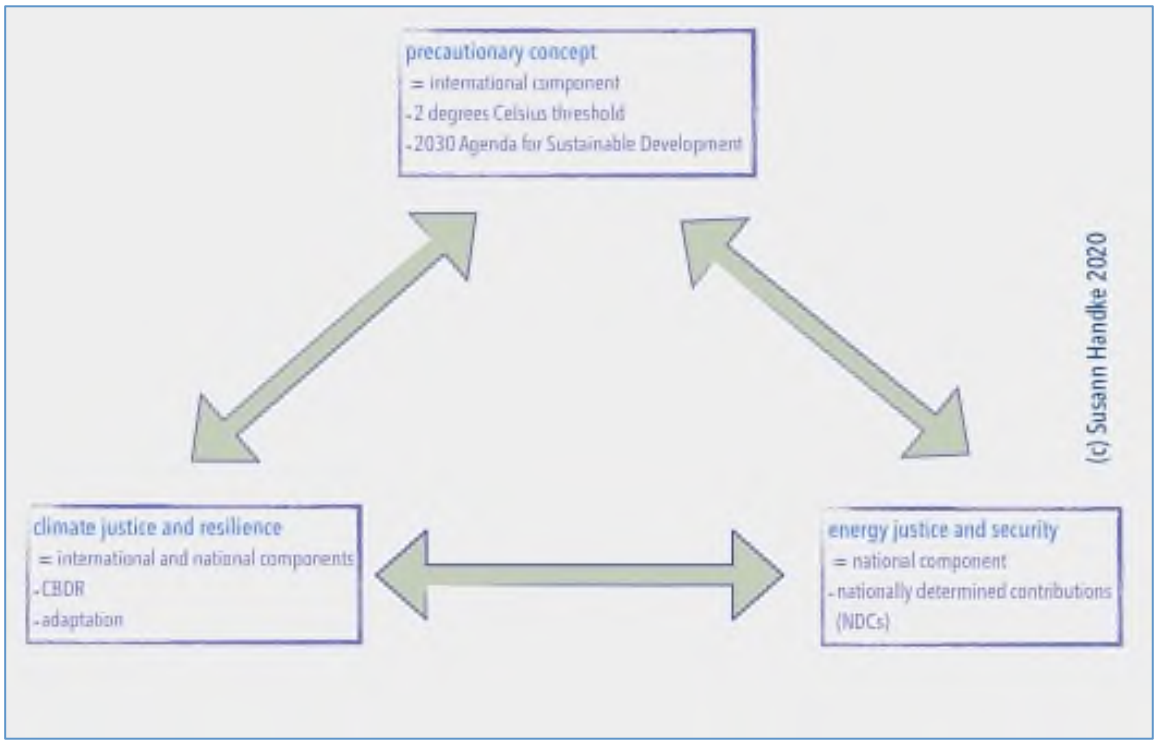
> 5. *Can a redefined CBDR principle in a reconstructed UN climate regime provide* ***meaningful differentiation*** *and (continue to) function as a principle of* ***good global environmental governance****?*

The emerging link between national and international decision-making on environmental affairs is a consequence of relying on bottom-up elements to manage climate change mitigation. Following this reconstruction, it is necessary to re-imagine which factors drive international climate cooperation and to determine where the locales of decision-making are situated.

This section shows that the provisions of the PA entail a comprehensive framework for future climate cooperation that reflect valuable concepts, such as precautionary action, climate justice and resilience, and energy justice and security. Based on these concepts, this section presents a triangular framework of climate cooperation and identifies where the concepts are included in the PA's provisions. This section also explains why these concepts form salient parameters of international climate cooperation and suggests the level of governance where related policies and norms have to be devised in order to regulate climate measures. It thus highlights the interconnections between climate change mitigation and fair burden-sharing, which have to be acknowledged at different levels of governance when putting the PA into practice.

The parameters of the framework not only are important signposts but also interact with each other. Indeed, there is a strong correlation between justice, energy policy, and the effects of anthropogenic climate change on the environment. For the visualisation of the framework a triangle seems to be most suitable (see figure 7.3), mainly because this shape helps to stress the fact that the environmental and socio-economic parameters of the framework have to be kept in balance. This section argues that imagining international climate cooperation in this way contributes to a better understanding of the reconstructed UN climate regime and what its implementation requires. If the parties take into account these parameters, which are incorporated in the PA, the UN climate regime can make a forward-looking contribution to global environmental governance.

Figure 7.4: Parameters of international climate cooperation under the Paris Agreement



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The preceding followed the concepts of decarbonisation and differentiation, the two storylines of this dissertation. By doing so, it was shown how both concepts, together with the UN climate regime, have been (re-)constructed. The regime's evolution allowed the states parties to pursue a novel approach under the PA and re-engage with international climate cooperation. Thus, in an attempt to envision international climate cooperation under the PA, this section explores the parameters of the triangular framework that, if adhered to, can shape international climate action in a meaningful way.

This section first sketches the triangular framework by describing its parameters – i.e. precautionary action, climate justice and resilience, and energy justice and security. Then, it relates these concepts closer to climate action and traces them in the provisions of the PA. Based on these findings, the last part of this section explains how these parameters frame international climate cooperation under the PA.

7.4.1. Interrelated components of climate cooperation under the Paris Agreement

The PA reconstitutes international climate cooperation. The agreement did not evolve in a vacuum, though. In fact, its innovative provisions and instruments were influenced by experiences and ideas that have been shaped in domestic policymaking spheres and through interaction at the international level. Chapter six showed how domestic decarbonisation measures that aim to reduce emissions in the electricity sector and subsequently restructure entire energy systems paved the way for the formulation of commitments to pursue low-carbon energy policies that then were submitted as NDCs to the international level.[170] Thus, the PA is part of a huge and unprecedented transformation that affects all aspects of society and the economy; and by relying on input from domestic law and policymaking the agreement interacts with the domestic sphere.

Furthermore, the PA leaves the main responsibility for regulating climate action to individual states. This is particularly true for mitigation policies, their pace, and the management of socio-economic and environmental challenges that result from the low-carbon transition of the energy system. Lawmakers contribute to this transformation by drafting legislation that helps regulate the large-scale societal and economic changes, which the transformation of the energy system brings about.

The UN climate regime coordinates the international dialogue about the regulation of this transformation, while also considering cooperation on adapting to ongoing climate change. The procedural and institutional framework that the UNFCCC established has proven helpful in facilitating international climate negotiations. The PA is able to further promote international exchange on salient aspects of climate change mitigation and adaptation through the institutionalisation of an interactional space.

As already mentioned, the PA also creates a substantive framework of international climate cooperation consisting of the precautionary concept as well as the concepts of climate justice and resilience and energy justice and security. In fact, the parameters of this framework furnish the interactional space. It thus gives the parties the opportunity of debating and reviewing national policies, global goals, and the nature of international climate cooperation. In these efforts, the parties are thus surrounded by the concepts that form the cooperation framework. To be sure, the framework is more than an *invitation* to include the concepts in the ongoing debates. Rather, these concepts involve vital considerations that will determine the prospects for and seriousness of future climate cooperation.

[170] *See* specifically, section 5.3.3. of chapter five.

The subsections 7.4.1.1. to 7.4.1.3 summarise the meaning of the concepts. They specifically discuss the concepts' relevance to climate change mitigation, their reflection in the PA and Decision 1/CP.21, and their importance for utilising the PA's interactional space in a forward-looking way.

7.4.1.1. Precautionary concept

The precautionary concept plays an important role in the legislative history of the PA. The EU, in particular, promoted the goal of containing the effect of global warming to "well below" 2˚C compared to pre-industrial levels.[171] The move to mention this threshold in a legal instrument linked to the UNFCCC was justified by referring to the precautionary concept.[172] In fact, Article 3 (3) UNFCCC states that parties should take "precautionary measures to anticipate, prevent or minimise the causes of climate change and mitigate its adverse effects."

The PA thus reflects the precautionary concept in Article 2 (1) (a) PA, by setting the goal of limiting the global temperature rise to well below 2˚C or even 1.5˚C, in order to "significantly reduce the risks and impacts of climate change." Article 4 (19) PA links the objectives of the PA, as stated in Article 2 PA, with the states parties' task to "formulate and communicate long-term low greenhouse gas emission development strategies." Therefore, decarbonisation can be understood as a precautionary policy. As emphasised in chapter one,[173] decarbonising energy generation concerns the largest chunk of greenhouse gas emissions. The temperature limit that the PA sets to global warming circumscribes the extent of the related policy strategies. The task of achieving carbon neutrality after 2050 also defines a timeframe for collective action.[174] Hence, it is fair to say that the precautionary concept forms a central aspect of international climate cooperation.

In the early stages of international climate cooperation, efforts to combat climate change were based on a call to engage in precautionary action to prevent future climate change. Back then, climate change was mainly imagined as an uncertain but very serious threat to humankind; and greenhouse gas emissions proved to have latent and long-lasting effects.[175]

To grasp the essence of precaution in relation to climate change, a brief clarification of the terminology and the various definitions of precaution in international environmental law is war-

[171] Article 2 (1) (a) PA states the objective of the PA as "[h]olding the increase in the global average temperature to well below 2˚C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5˚C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change."
[172] *See* for an overview of the evolution of the 2˚C target within the UN climate regime, Gao et al, "The 2˚C Global Temperature Target and the Evolution of the Long-term Goal of Addressing Climate Change: From the United Nations Framework Convention on Climate Change to the Paris Agreement," *Engineering* 3 (2017): 272–8.
[173] *See*, chapter one, subsection 1.1.1., figure 1.2.
[174] *See*, Article 4 (1) PA.
[175] Wiener, Jonathan B., "Precaution and Climate Change," in *Oxford Handbook of International Climate Change Law*, ed. Kevin R. Gray, Richard Tarasofsky, and Cinnamon Carlarne (Oxford: Oxford University Press, 2016), 164.

ranted. Using the term "precautionary concept" helps to cover the meaning of the international legal principle of precaution as well as the general approach on which further policies and concrete measures are based.[176]

In fact, the notion of precaution transcends the boundary of the legal realm and the sphere of policymaking. Ellen Hey considers the precautionary concept as an element of "a holistic approach to environmental problems," which acknowledges the interrelationship between development and environmental degradation, as improperly planned development and the lack of development are important causes for environmental degradation.[177] Economic and environmental policies need to get in sync with the increase in knowledge about environmental hazards. Since the precautionary concept seeks to address ignorance and doubts about effects that result from human interaction with the environment, decision-makers cannot hide behind uncertainties that are engrained in scientific research,[178] including gradually emerging knowledge about climate change.

Nevertheless, going beyond this fundamental contribution of the precautionary concept and linking international legal scholarship on precaution to climate change is difficult for two reasons. First, the precautionary principle has several meanings in international environmental law. Second, assumptions about climate change itself and its consequences as well as available policy options are still evolving.

The relation of the precautionary concept and climate change depends on how one defines the content of the precautionary principle. In the absence of one authoritative statement of the precautionary principle, it is necessary to navigate between different versions of the principle. Jonathan Wiener identifies three basic versions of the principle. The common feature is uncertain science in the face of considerable risk to life and the physical environment. The first version of the principle enables action to counter these risks, while the second version provides a rationale for action and urges for regulatory intervention.[179] A third version shifts the burden of evidence. The proponent of a potentially dangerous activity will have to demonstrate that this activity would pose no or only acceptable risks. Thus, this version introduces a standard of proof that the proponent of an activity has to meet.[180]

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[176] Hey, Ellen, "The Precautionary Concept in Environmental Policy and Law: Institutionalizing Caution," *The Georgetown International Environmental Law Review* 4, no. 2 (1991): 303–4.
[177] Ibid., 318.
[178] Ibid.
[179] Wiener, Jonathan B., "Precaution," in *Oxford Handbook of International Environmental Law*, ed. Daniel Bodansky, Jutta Brunnée, and Ellen Hey (Oxford: Oxford University Press, 2007), 604.
[180] Ibid., 606.

When putting the precautionary principle into relation with climate change, Wiener concludes that climate policies, which adhere to the precautionary concept, inevitably have to pursue a dynamic approach. Since knowledge improves over time, updating of initial policies is necessary.[181] Accordingly, the design of climate policies needs to consider the cost-effectiveness and co-benefits of proposed measures and has to avoid adverse side-effects. Most importantly, however, climate policy designs must positively acknowledge their own "provisionality" by integrating a sequence of adaptive learning and updating.[182] This feature also helps to bridge the phases of precaution and "post-caution," which to some extent are unfolding simultaneously.[183] The notion of post-caution concerns measures to adapt to climate change, negative emissions technologies,[184] and attempts that seek to interfere with the symptoms of already changed climate patterns,[185] while mitigation action (precaution in the conventional sense) is ongoing. These technologies, if implemented, will have large-scale effects. Adhering to the precautionary concept in this context is pivotal.

The intensity of precautionary climate policies is also debatable. Chris Shaw demonstrates how the rather arbitrarily chosen threshold of a 2˚C global temperature rise compared to pre-industrial levels shaped the notion of "dangerous" climate change. In fact, scientists never calculated this threshold to constitute a safe limit.[186] Given the variable nature of the effects of global warming and how climate change is unfolding across the globe, it is not feasible to state one dangerous limit for the entire planet.[187] Shaw also points to the way in which the precautionary principle is applied to climate change measures that often merely resembles a cost-benefit analysis and is more concerned with the political economy of climate policy than the environment.[188] The drafters of the PA were also unsure whether 2˚C would be safe enough a limit to put on global warming: In 2015, the states parties invited the IPCC to deliver a special report on the estimated impacts of a global temperature rise of 1.5˚C.[189] This exercise provides a point of departure for policymakers and the public for starting to imagine the multi-complex future of a world with a drastically changed climate.[190]

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[181] Ibid., 610.
[182] Wiener, Jonathan B., "Precaution and Climate Change," In *Oxford Handbook of International Climate Change Law*, ed. Kevin R. Gray, Richard Tarasofsky, and Cinnamon Carlarne (Oxford: Oxford University Press, 2016), 175–7.
[183] Ibid., 178, 180–1.
[184] These technologies are envisioned to suck CO_2 out of the atmosphere.
[185] Examples of such activities are research and deployment of geo-engineering techniques that try to achieve more favourable weather conditions in a changing climate by interfering in the atmosphere or solar radiation modification.
[186] Shaw, Chris, "The Dangerous Limits of Dangerous Limits: Climate Change and the Precautionary Principle," *The Sociological Review* 57, no. 1 (2009): 108–12, 116, 117; see also Nordhaus, Ted, "The Two-degrees Delusion: The Dangers of an Unrealistic Climate Change Target," *Foreign Affairs*, 8 February 2018, https://www.foreignaffairs.com/articles/world/2018-02-08/two-degree-delusion.
[187] Shaw, 2009, 103.
[188] Ibid., 108.
[189] Decision 1/CP.21, para 21.
[190] International Panel on Climate Change (IPCC), "Global Warming of 1.5˚C: An IPCC Special Report on the Impacts of Global Warming of 1.5˚C above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global

To be sure, the initial NDCs submitted by the parties are insufficient to stay within the 2˚C limit;[191] and the 2018 IPCC special report also shows that this limit cannot be considered a threshold for a safe world.[192] This is an unmistakable call for more ambition with respect to national climate actions. In managing climate cooperation, the 2˚C limit thus serves another cause. For contextualising the task of designing mitigation measures that reflect the "highest possible ambition,"[193] it is important to accept the symbolic nature of the 2˚C limit and acknowledge the already visible dangerous effects of climate change.

The precautionary concept relates to climate change in two ways. First, it concerns the need to address the threat of climate change as such. Second, it is also relevant to measures that are taken in response to the coming about of global climate change. The first interaction touches upon the 2˚C threshold and the need to reduce greenhouse gas emission in order to avoid dangerous climate change. The second instance in which precautionary action needs to be considered in the context of climate action concerns negative-carbon technologies or geo-engineering – i.e. far-reaching intervention in the environment to reduce CO_2 in the atmosphere or interfere with weather patterns.

The PA's reference to sustainable development attests to the treaty's broader approach to climate cooperation.[194] Decision 1/CP.21 explicitly links the actions under the PA to goal 13 of the 2030 Agenda for Sustainability Development.[195] Undoubtedly, global climate cooperation and the realisation of the UN Sustainable Development Goals are intrinsically linked. Considering NDCs and sustainable development targets together avoids duplication and saves resources.[196]

The PA facilitates a shift of focus away from preventing harm to more holistic policies. Thus, the PA promotes an understanding of climate cooperation that goes beyond the realm of technology and

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Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty – Summary for Policymakers," 6 October 2018, http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf, pp. 1–33.

[191] The IPCC emphasises that current national mitigation ambition until 2030 are consistent with pathways that would result in a global warming of about 3˚C by 2100, with continuing warming after the turn of the century. *See*, Decision 1/CP.21, para 17; IPCC, 2018, para D1.1.

[192] The IPCC report concludes that human activities have already caused a global warming of 1˚C above pre-industrial levels. Considering the current rate of increase, the level of 1.5˚C will likely be achieved between 2030 and 2050. The effect of warming is different in different regions; it is more intense many land regions. The temperature increase in the Arctic is two to three times higher than the global annual average rise. Indeed, some impacts of climate change on natural and human systems have already been observed, as many land and ocean systems function differently as a result of ongoing global warming. The loss of some ecosystems is already irreversible. Future impacts of global warming differ considerably between the limits of 1.5˚C and 2˚C. For instance, the IPCC holds with "medium confidence" that limiting global warming to 1.5˚C will prevent the thawing of a permafrost area in the range of 1.5 to 2.5 million km^2. In any case, risks increase significantly if global warming exceeds 1.5˚C and reaches 2˚C, with respect to unique and threatened ecosystems, extreme weather events, the distribution of impacts, global aggregate impacts, and large-scale singular events. IPCC, 2018, paras A1.1, A1.2, A3.1, A3.2, B3.3, B5.7.

[193] Article 4 (3) PA.

[194] The Paris Agreement refers to the concept of sustainable development in its preambular recitals 8 and 16. Further, sustainable development is mentioned in Articles 2 (1), 2 (1) (b), (c), 6 (4) PA as well as in recital 4 and paras 108 and 109 (a) of Decision 1/CP.21.

[195] "Take urgent action to combat climate change and its impact." The goal entails the integration of climate change measures into national policies, strategies, and planning and improving "institutional capacity on climate change mitigation, adaptation, impact reduction and early warning."; see UN GA Res. A/RES/70/1, 25 September 2015 (Transforming our world: The 2030 Agenda for Sustainable Development), goal 13, especially 13.2 and 13.3.

[196] Dzebo et al, "Exploring Connections between the Paris Agreement and the 2030 Agenda for Sustainable Development," *SEI Briefs*, 3 November 2017, https://www.sei.org/mediamanager/documents/Publications/SEI-PB-2017-NDC-SDG-Connections.pdf, p. 4.

science, as it also concerns social and political aspects of climate change. The discourses on the remaining elements of the proposed triangular framework of climate cooperation further clear our vision for dealing with climate change, as the following discussion of climate justice and resilience and energy justice and security show.

7.4.1.2. Climate justice and resilience

The concept of climate justice[197] is closely related to the CBDR principle. Many aspects that the legal discourse on the CBDR principle covers are entailed in this concept – such as the issues of historical responsibility for anthropogenic greenhouse gas emissions, intergenerational justice, and intra-generational justice. Climate justice mainly concerns a fair burden-sharing with respect to those individuals, communities, and states that are disadvantaged as a result of a changing climate. Efforts to achieve a just contribution by all states to the task of dealing with climate change pertain to both global mitigation and adaption action.

The preceding sections analysed the refined CBDR principle in the PA and considered the interrelationship between justice concerns and states parties' differentiated commitments to mitigate climate change.[198] The examination of the role that the refined CBDR principle plays under the PA concluded that the refined CBDR principle reasserts the concept of differential treatment as it had emerged in international environmental law prior to the adoption of the KP – i.e. providing assistance to developing states and allowing for less rigid commitments by this group of states.[199] This constitutes a practice-oriented form of burden-sharing that acknowledges the parties' different domestic situations.

Furthermore, the PA refers to the principle of equity as a guiding principle.[200] Preambular paragraph 11 of the PA explicitly mentions intergenerational equity as a concern that states parties should consider in the context of their climate actions. Specifically, equity contextualises long-term mitigation efforts as well as the conduct of the global stocktake.[201]

The concept of climate justice can be understood to cover the essence of balancing different interests and socio-economic circumstances. Both the CBDR and equity principles are guided by similar considerations. Reviewing the discourses on climate justice helps to identify challenges and

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[197] *See* for a summary of the correlation between environmental justice and different discourses that relate to climate justice, Schlosberg, David, and Lisette B. Collins, "From Environmental to Climate Justice: Climate Change and the Discourse of Environmental Justice," *WIREs Climate Change* 5, no. 3 (2014): 359–74.
[198] *See*, Articles 2 (2), 4 (19), 7 (5), (6), (7) (d), (13) PA.
[199] *See*, subsection 7.3. and its summary of how differentiation is operationalised in the PA.
[200] *See*, preambular paragraph 3 PA, Article 2 (2) PA.
[201] *See*, Articles 4 (1), 14 (1) PA .

difficulties that are linked with the pursuit of equity in the context of climate action at local, national and international levels of governance. In addition, climate justice is increasingly reflected in human rights discourses.[202]

In the context of the UN climate regime, the concept of climate justice initially emphasised the idea of a shared carbon budget, mainly because the dominant thinking about climate justice was based on the notion that the atmosphere is a common good. This initial conceptualisation correlated with the two-stage process in which international negotiations about climate action evolved. First, the parties chose a target – limiting emissions to a certain level. Then, the parties decided on how they could share the burdens of achieving this target. The parties thus sought to regulate how to share the remaining carbon budget.[203]

However, this understanding of climate justice no longer dominates international climate negotiations. The failure to set up a global carbon market under the KP[204] illustrates how difficult it is to transform ideas about global justice into regulation. The post-Kyoto climate negotiations were not informed by the notion of equal access to the atmosphere. The PA, by emphasising nationally determined commitments to mitigation and applying a refined CBDR principle, has turned justice concerns into an issue of local or national justice.[205] Additionally, from 2009 onwards the justice discourse that pertains to global climate governance fragmented into predominantly local concerns about climate justice and energy justice[206] and several variations of the discourse on global climate justice.

The fragmentation of the climate justice discourse became noticeable during the Cancun COP in 2010. Subsequently, bargaining coalitions in international climate negotiations contributed to three main discourses of climate justice.[207] The concept of climate justice is socially constructed. The annual COPs form a platform on which the discourses are redefined; and states parties' re-interpret their identities in relation to issues that these discourses pertain to.[208] These discourses generally cover three facets of climate justice – i.e. the right to emit greenhouse gases, vulnerability related to the effects of climate change, and abatement costs.[209]

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[202] *See* for an overview, Stabinsky, Doreen, "Climate Justice and Human Rights," in *Routledge Handbook of Human Rights and Climate Governance*, ed. Sébastian Duyck, Sébastian Jodion, and Alyssa Johl (London: Routledge, 2018), 280–91.
[203] Pottier, Antonin, Aurélie Méjean, Olivier Godard, and Jean-Charles Hourcade, "A Survey of Global Climate Justice: From Negotiation Stances to Moral Stakes and back," *International Review of Environmental and Resource Economics* 11, no. 1 (2017): 16.
[204] *See*, subsection 6.3 of chapter six.
[205] Pottier et al, 2017, 40.
[206] *See*, subsection 7.4.3.
[207] Audet, René, "Climate Justice and Bargaining Coalitions: A Discourse Analysis," *International Environmental Agreements* 13, no. 3 (2013): 369–86.
[208] Ibid., 375.
[209] Ibid., 371.

The issue of unjust emissions allocation was often articulated in relation to the notion of responsibility, signalled by opposing statements about the CBDR principle. Yet, this discourse and its main argument is losing traction among both developed and developing states parties. The break-up of the G-77, a coalition that unanimously upheld this dimension of climate justice in the past, gave way to a bridging of developed and developing states' concerns. This is reflected in the convergence of the two other climate justice discourses on vulnerability and abatement costs.[210]

Many developing states parties began to focus on the impact of climate change on their environment and society, resulting in the vulnerability discourse. Yet, they are also ever more drawn to join the transition discourse that is promoted by developed states, especially by the EU, and combines the concept of climate justice with the premises of decarbonising economic activity as well as adaption action.[211] These discourses inevitably inform expectations of how parties engage in climate cooperation under the PA, while the CBDR principle is evocative of fair burden sharing in the context of international climate action.

Accordingly, the concept of climate justice links vital local, national, and international debates.[212] In practice, climate justice has many faces. Global climate justice activists interact with local communities that campaign on climate issues, either responding to impacts of climate change or protesting against industrial conglomerates of the fossil-fuel era that affect their communities.[213] The global climate justice movement exchanges knowledge about the impact of climate change and political strategies to influence corporate and government decision-making.[214] Prominent lawsuits also influence the conceptualisation and governments' responses.[215] Hence, the concept of climate justice is continuously being re-constructed and re-narrated, while input at various levels of decision-making is in flux.

No doubt, growing effects of climate change and dynamic demands for justice will further contribute to the evolution of the concept of climate justice[216] and access to justice in this regard. The link between climate justice and human rights is often discussed. Thus far, it is difficult to predict the direction of the debate, both on the narrower issue of climate justice as well as related to human rights and access to justice issues in this regard. Yet, it seems very likely that in a hotter and

[210] Ibid., 381.
[211] Ibid., 382.
[212] Schlosberg and Collins conclude that efforts to promote climate justice constitute a movement that is "at once international and local." *See*, Schlosberg and Collins, 2014, 370.
[213] Evans, Geoff, "A Rising Tide: Linking Local and Global Climate Justice," *The Journal of Australian Political Economy*, no. 66 (2010): 199–221.
[214] Ibid., 213.
[215] *See* for an overview, Huang, Jennifer, and Maria Antonia Tigre, "Trends in Climate Justice Litigation: The Dutch Case and Global Repercussions," in *Climate Justice: Case Studies in Global and Regional Governance Challenges*, ed. Randall S. Abate (Washington, DC: ELI, 2016), 571–96.
[216] Schlosberg and Collins, 2014, 370–1.

overpopulated world the "very nature" of human rights and theories of global justice will inevitably be reappraised, mainly because of the unprecedented threat that climate change poses to the international community.[217]

Future COPs and in particular the interactional space that the global stocktake creates will absorb the outcomes of these discourses. The interaction at the global level will re-connect with how states parties define themselves in response to evolving understandings of climate justice and changing priorities of their domestic constituencies. The notion of preventing societal conflicts by considering climate justice links this concept with the discourses on climate resilience.

Indeed, the threat that climate change poses not only concerns the survival of humankind in the physical sense but also the survival of human society. Climate change alters social practices that eventually can lead to conflict and normative change. The concept of climate resilience relates to the risk that climate change could lead to social, economic, and political instability or even armed conflicts.[218] Conflicts arise when, for instance, vital sectors of a country's economy – such as agriculture or fishery in poor developing states – are suffering and large chunks of the population are deprived of their incomes. If left unabated, either because of government's ignorance or inability to implement climate measures, such disturbances could rig entire societies and result in prolonged political instability or armed conflict. Government's inability to respond might be the consequence of insufficient financial means and/or a lack of administrative and technological capacity to implement climate measures.

Accordingly, the notion of climate security or resilience is conceptualised by the response governments perceive as effective and manageable.[219] Climate resilience is imagined in the context of strategic considerations, the functioning of the economy and its institutions, social stability, and the preservation of ecosystems.[220] In addition, several discourses on the securitisation of climate change have been evolving thus far. The concept of climate security specifically concerns conflict situations, while climate resilience covers issues related to socio-economic and political stability.

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[217] *See* for this correlation, Jamieson, Dale W., and Marcello Di Paola, "Climate Change and Global Justice: New Problem, Old Paradigm?," *Global Policy* 5, no. 5 (2014): 109–10.

[218] In 2007, a report by International Alert, an independent peacebuilding organisation, concluded that 46 states – home to 2.7 billion people – were at risk of climate-change related armed conflicts and 56 additional states faced "a high risk of political instability as a knock-on consequence of climate change." *See*, Smith, Dan, and Janani Vivekananda, "A Climate of Conflict: The Links between Climate Change, Peace and War," November 2007, https://www.international-alert.org/sites/default/files/ClimateChange_ClimateOfConflict_EN_2007_0.pdf, pp. 3.

[219] Angela Oels relates the effects of climate change to the notion of governmentality – i.e. a mode of exercising and securing power or existing structures of governance. *See*, Oels, Angela, "Climate Security as Governmentality: From Precaution to Preparedness," in *Governing the Climate: New Approaches to Rationality, Power and Politics*, ed. Johannes Stripple and Harriet Bulkeley (Cambridge: Cambridge University Press, 2014): 197–216.

[220] *See*, Ferguson, Peter, "Discourses of Resilience in the Climate Security Debate," *Global Environmental Politics* 19, no. 2 (2019): 104–26.

Indeed, the discourses give priority to very diverging issues. The most influential conceptualisations of climate security hinder a forward-looking solution to the threat of climate change, as they are leaning towards preserving the status quo rather than engaging in a far-reaching transformation of current economic patterns and social practices.[221] Deliberations at the UN Security Council illustrate these dynamics,[222] where the members of the Security Council are divided about the Council's role with respect to climate change.[223]

The UN climate regime takes into account the disruptive effects of climate change by an increasing focus on resilience. The PA uses the terms "climate resilience"[224] and "adaptive capacity"[225] in this context. The concept is also part of the objective of the PA. It is reflected in Article 2 (2) (b) and (c) PA, providing that states parties should "foster climate resilience" and enable financial flows to support "climate-resilient development" as part of their efforts to "strengthen the global response to the threat of climate change." The concept of climate resilience is also included in articles of the PA that generally concern measures to strengthen the capacity of states to deal with the effects of climate change.[226]

Resilience describes the degree to which a system is able to absorb changes. Since enhancing climate resilience is part of international climate action, local and national policies and regulations that aim to improve communities' climate resilience are of considerable importance to the global picture. This particularly relates to international action to support developing states with respect to the implementation of adaptation measures,[227] provision of technology,[228] and capacity-building.[229]

Decision 1/CP.21 broadens the climate resilience debate by inviting "all relevant United Nations agencies and international, regional and national financial institutions to provide information" on how they incorporate "climate-proofing and climate resilience measures" in their development and climate finance programmes.[230] Further, it establishes a technical examination process[231] on

[221] McDonald, Matt, "Discourses of Climate Security," *Political Geography* 33 (2013): 50.
[222] Thus far, the UN Security Council has discussed climate-change related security issues in 2007, 2011, and 2018.
[223] Some state representatives emphasised the link between the effects of climate change in the most vulnerable developing states and the risk of conflict. Other advocated the creation of new institutions in order to structure the Security Council's approach to climate-related risks to peace and stability. Following a narrower reading of the Council's responsibilities, the representative of the Russian Federation rejected the idea of involving the Security Council in climate change matters. In July 2018, consistent with this approach, Russia's representative argued that these matters should be addressed within national borders and under appropriate UN agencies and departments. *See*, United Nations, "Addressing Security Council, Pacific Island President Calls Climate Change Defining Issue of Next Century, Calls for Special Representative on Issue," 11 July 2018, https://www.un.org/press/en/2018/sc13417.doc.htm.
[224] *See* Articles 2 (1) (b), 10 (1) PA.
[225] *See* Article 7 (1) (b) PA.
[226] Article 7 (9), (10) PA.
[227] *See* Articles 7 (1), (2), (9), (10), 10, 11 PA.
[228] Article 10 PA.
[229] Article 11 PA.
[230] Decision 1/CP.21, para 43.
[231] Ibid., para 124.

adaptation that will "identify concrete opportunities for strengthening resilience, reducing vulnerabilities and increasing the understanding and implementation of adaptation actions."[232] Decision 1/CP.21 also invites non-party stakeholders[233] to "build resilience and decrease vulnerability to the adverse effects of climate change."[234] Thus, efforts to enhance climate resilience feature prominently in the way in which the PA envisages climate cooperation. The inclusion of climate resilience in the PA is indicative of the complexity of actions that have to be coordinated. Although climate resilience mainly concerns the local level of decision-making, it is vital to exchange best practices and provide funding for poorer states parties. Thus, various levels of governance have to collaborate to react in a timely manner.

However, the purpose of governments' climate measures in this regard is also important. The most prominent discourses on climate resilience primarily pertain to the relation of climate change with national security, human security, and international security, by referring to the situation of individual states, humankind, and the international community, respectively.[235] The discourses that derive from this referencing give the military and other traditional security providers as well as existing international organisations a leading role,[236] mainly because they focus on the preservation of territorial integrity of states or the stability of the international society of states. Yet, these discourses divert attention from the environmental context to the traditional objects of protective security measures – i.e. the status quo of the national and international political order.[237]

From an environmental perspective, the most relevant approach to climate resilience is the ecological discourse that considers the effects of climate change on ecological security. It takes as point of reference ecosystems instead of social communities or states. This approach challenges the securitisation of the issue and stresses the necessity of collective action and international cooperation.[238]

Indeed, only in the discourse that links climate change to ecological resilience is the biosphere the object of security thinking. The discourse centres around a fundamental rebalancing of the relationship between the people and their natural environment, including a reconsideration of political, economic, and social structures that result in environmental degradation. Non-

[232] Ibid., paras 125.
[233] Paragraph 133 of Decision 1/CP.21 mentions as non-party stakeholders civil society, the private sector, financial institutions, cities and other subnational authorities.
[234] Decision 1/CP.21, para 134.
[235] In these discourses, the term "climate security" is usually used.
[236] Although in the discourse that links human security with climate change communities are the main referent, their agency in responding to the threats they face is only acknowledged ambiguously. This leaves room for the states and militaries to reassert a central role in providing security. *See*, McDonald, 2013, 47.
[237] Ibid., 48, 49.
[238] Ferguson, 2019, 119.

governmental organisations that are part of this discourse aim to pursue projects and initiatives with local community groups and civil society actors that prioritise sustainability, social and ecological equity, and poverty eradication.[239] In fact, this contextualisation of climate resilience displays some practical overlap with the concept of climate justice. Hence, the PA and its framework for climate cooperation needs to be appreciated in the context of these discourses. In essence, the PA dovetails the various discourses and acknowledges the centrality of justice and environmental concerns for its implementation.

7.4.1.3. Energy justice and security

Fair and undisrupted access to energy supplies is primarily a concern of national policymakers. Although the concept of energy justice is not irrelevant to the global debate about access to energy and the eradication of energy poverty,[240] it is mainly the task of national governments to take into account vulnerable groups and disadvantaged regions when designing energy policies. Thus, domestic laws and regulation aim to create an institutional environment that facilitates affordable, ecologically sustainable, and reliable flows of energy. Maintaining and providing access to inexpensive energy supplies is an essential precondition for realising the low-carbon transition.

The concept of energy justice considers the entire energy system, applying justice principles to activities from energy production to energy consumption. The concept includes the dimensions of generating and consuming energy as well as considerations of just distribution and procedural matters.[241] These justice concerns pertain to distributional matters, the recognition of groups and regions, and institutional arrangements.[242]

First, as part of the concept of energy justice, distributional justice relates to the physically unequal allocation of environmental benefits and ills – such as the siting of vital energy infrastructure – and affordable access to energy.[243] Second, recognition justice entails that individuals must be represented fairly. Accordingly, all individuals must be respected, free from physical threats, and able to assert political rights in the context of energy policies. Thus, energy justice is acknowledged when people who protest against wind farms near their homes are respected

[239] McDonald, 2013, 48.
[240] Benjamin Sovacool and Michael Dworkin consider fairness issues in the global energy system, both related to the access of energy and the low-carbon energy transition. *See*, Sovacool, Benjamin K., and Michael H. Dworkin, *Global Energy Justice: Problems, Principles, and Practices*. Cambridge: Cambridge University Press, 2014.
[241] Fuller, Sara, and Darren McCauley, "Framing Energy Justice: Perspectives from Activism and Advocacy," *Energy Research and Social Science* 11 (2016): 2.
[242] Jenkins et al, "Energy Justice: A Conceptual Review," *Energy Research and Social Science* 11 (2016): 174–82.
[243] Ibid., 176.

by both the companies involved and the government. Misrepresenting their intentions or depicting their protests as "not-in-my-backyard" actions[244] would betray energy justice principles. Third, procedural justice in the context of energy developments concerns access to national decision-making processes, including impartial and full information from both government and industry as well as equal representation in decision-making institutions, in order to create a basis for mediating between different interests.[245] In fact, the pursuit of energy justice helps to resolve tensions between groups that result from diverging concerns about access and provision of energy services.[246]

The principles entailed in the concept of energy justice necessarily apply to the whole energy system.[247] They shape energy policies as well as laws and regulation that guide the low-carbon energy transition. Energy justice is a precondition for embedding the low-carbon transition in social and environmental policies. This approach is vital in order to avoid conflicts and errors of previous large-scale industrial transformations. The account of the planning process and construction of the large-scale Storheia wind park that was discussed in chapter two illustrates the challenges that policymakers, lawyers, and society face in this process.[248]

In the course of decarbonising the energy system, governments both in developed and developing states have to find ways to guarantee affordable, sustainable, and reliable flows of energy to society and the economy. Policymakers thus generally take into account the concept of energy security. However, following already noticeable climatic changes in recent years this concept has been evolving and broadened in scope. It also reflects a more integrative approach to the entire energy system, instead of relating energy security to particular sectors of the energy system.[249] Thus, it is important to keep in mind that in its scale the decarbonisation of energy generation is an unprecedented economic transformation under threatening environmental conditions. The latter point is particularly relevant for the infrastructure that is needed to realise the low-carbon transition.

Three aspects are influencing the discourse on energy security and illustrate its interdisciplinary conceptualisation. They concern sovereignty matters rooted in political science, the thinking about

[244] Ibid., 177.
[245] Ibid., 178, 180.
[246] LaBelle, Michael Carnegie, "In Pursuit of Energy Justice," *Energy Policy* 107 (2017): 615–20.
[247] Jenkins et al use the term "energy system justice" to include all justice principles as well as the notion of applying the principle from energy production to consumption. *See*, Jenkins et al, 2016, 180.
[248] *See* textbox 2.1 in subsection 2.2.3.
[249] Traditionally, the energy security discourse primarily concerned the security of stable oil supplies, mainly because these supplies face numerous geopolitical risks – regarding producing regions and routes of transport.

robustness derived from natural science, and resilience based on economics and complex systems analysis.[250]

First, the central question with respect to sovereignty is who (or which entity) controls energy resources and through which mechanisms.[251] During the second half of the 20th century energy security concerns have led to national mechanisms and several international regimes that seek to coordinate policies in order to prevent instability of vital energy supplies. Maintaining strategic oil reserves and the establishment of the International Energy Agency with its initial focus on oil security are cases in point.[252] The energy transition and increasing use of renewables are changing the patterns of influence on the global energy business.[253] National energy policies and choices for certain energy resources begin to acknowledge these shifts and further shape an ever more complex global energy landscape.

Second, the robustness dimension of energy security relates to vulnerabilities other than politically motivated disruptions. The complexity of energy systems and industrial societies' increasing dependence on reliable energy flows, especially the transmission of electricity, informs the thinking about energy security from technical and natural science perspectives.[254] Climate resilience of energy infrastructure, such as the protection of transmission lines against extreme weather events, comes to mind.

Third, the stability of energy markets concerns the regulation of energy supplies, especially the purchase of electricity. Electricity regulation is vital for the entire energy system, which regulatory failures vividly illustrated in the past. Manipulations by Enron employees and extensive deregulation led to market distortions and blackouts in California. The risk of market failures can be reduced by diversifying among energy supply options that have different risk profiles. Diversification considerations apply to fuels, technologies, producer regions, industrial interests, and infrastructures.[255]

Whereas in the past varying challenges to energy security could be dealt with separately, the evolving concept of energy security acknowledges the complexity of current energy systems[256] and pursues a more and more comprehensive approach.[257] It is important to note that the political,

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[250] Cherp, Aleh, and Jessica Jewell, "The Three Perspectives on Energy Security: Intellectual History, Disciplinary Roots and the Potential for Integration" *Current Opinion in Environmental Sustainability* 3 (2011): 202.
[251] Ibid., 2011, 204.
[252] Ibid., 205.
[253] *See* for an overview, Scholten, Daniel, eds. *The Geopolitics of Renewables*. Cham: Springer, 2018.
[254] Cherp and Jewell, 2011, 205.
[255] Ibid., 206.
[256] Chester, Lynne, "Conceptualising Energy Security and Making Explicit Its Polysemic Nature," *Energy Policy* 38 (2010): 889.
[257] Cherp and Jewell, 2011, 208.

environmental, social, and economic factors that influence the concept of energy security are constantly changing.[258] Including climate change concerns complicates the picture even further.

Although the concepts of energy justice and energy security primarily pertain to national policymaking, the PA adds an international aspect to national debates. The PA obliges the states parties to start decarbonising their energy systems. Article 4 (19) PA states that the parties "should strive to formulate and communicate long-term low greenhouse gas emission development strategies." Furthermore, the states parties communicate their domestic energy and climate policies to the secretariat and have to demonstrate increasing efforts and the "highest possible ambition" with respect to decarbonisation efforts.[259]

Accordingly, national debates will be brought to the interactional space that the global stocktake creates when it assesses global climate action. Considerations of energy justice and energy security issues, especially in states with large and growing emissions, inevitably become an international concern. Decisions by the governments of these states or local activism that affect their energy strategies have a great impact on the global energy business.[260] Badly managed energy transitions in these states would have serious repercussions on international climate cooperation. The PA establishes a forum for regular exchange about these vital issues in order to enhance awareness and cooperative responses and integrate national discourses into the international debate.

7.4.2. Reframing climate cooperation under the UN climate regime

The PA re-envisions international climate cooperation. Section 7.4. depicts the PA's conceptualisation of climate cooperation as a triangular framework. The previous subsections explained the parameters of this triangle. The definitions of all elements that form this framework are evolving along with the interaction between humankind and the environment and, more specifically, the effects of climate change and emerging patterns of energy use.

The first global stocktake pursuant to Article 14 (2) PA will take place in 2023. In fact, the expert review that Article 13 (11) PA requires and the global stocktake introduce a dynamic element – regular assessment of national situations and periodic reconsideration of international climate action

[258] Lynne Chester characterises the concept of energy security as polysemic. *See*, Chester, 2010, 893.
[259] Article 4 (3) PA.
[260] Frank Verrastro and Sarah Ladislaw show that the great challenge in the current global energy business for policymakers is the task of managing "the increasing complexity of an energy-interdependent world, while striving to meet economic, security, and environmental goals." *See*, Verrastro, Frank, and Sarah Ladislaw, "Providing Energy Security in an Interdependent World," *The Washington Quarterly* 30, no. 4 (2007): 95.

under the PA "in the light of equity and the best available science."[261] This formulation indicates that the future path of climate cooperation is not only evaluated based on evolving understandings of climate change and policy measures to combat it but also leaves room to acknowledge global justice, in particular the discourses on climate justice. It will be important to observe whether and how the states parties embrace the PA's guidance for international climate cooperation that could emerge from the instruments that facilitate regular interaction among states parties. The PA and Katowice Rulebook provide parameters and guidance of how the cooperation between states parties under this agreement can evolve.

The triangular framework and its elements form a useful tool to understand the parameters of climate cooperation and their interaction. It reminds all actors of the close correlation between justice concerns and the need for more ambitious climate action, while the elements of the framework themselves are still evolving. Nevertheless, the parties face three challenges when implementing the PA. These challenges relate to climate finance, the principle of state sovereignty, and the openness to discuss domestic climate measures with other states parties.

First, the mitigation of climate change will require far more financial resources than those that have been made available thus far.[262] Resources are needed to support mitigation and adaptation efforts in developing states. To a much greater degree than in the past, financial flows will have to be re-directed away from fossil fuels to renewable energy sources, in order to make rapid progress in decarbonising economic activity, especially in industrialised and emerging economies.

Second, the tool of NDCs and the global stocktake allow the states parties to assess each other's progress and ambition, both in designing and enacting domestic climate measures. In the past, discussing national circumstances by urging more action merely was a rhetorical exercise. However, the PA and Katowice Rulebook give the states parties a fair amount of discretion on how to formulate and implement domestic climate measures. States parties will need to accept the interactional space that the PA creates and kick their habit of avoiding discussions about national circumstances by alluding to the principle of state sovereignty. In fact, the frequent inclusion of the phrase "in the light of different national circumstances" can only be taken seriously when effectively communicating and reviewing national situations. Discussions about national policies inevitably contain assessments of how a party's climate action takes into account environmental considerations beyond the reduction of greenhouse gas emissions and whether it is based on the precautionary

[261] Article 14 (1) PA.

[262] Rosemary Lyster points to the lack of climate finance, especially for financing measures in developing states, which constitutes a crucial obstacle to meaningful climate cooperation. *See*, Lyster, Rosemary, "Climate Justice, Adaptation and the Paris Agreement: A Recipe for Disasters?," *Environmental Politics* 26, no. 3 (2017): 438–58.

concept. Furthermore, states parties will be interested to hear from each other about the response to potential security threats that have been caused by insufficient climate action in the past. This is an intrinsic element of global climate cooperation and also determines the level of required adaptation funding and action.

Third, these considerations closely relate to the refined CBDR principle and states parties' appreciation of the principle's refinement, which also requires to acknowledge the changing and fragmenting discourse on climate justice. Thus, by merely focusing "North-South" issues in this context states parties would disregard the adjusted meaning that the CBDR principle conveys in the PA. Justice concerns are at play both globally and nationally. States parties will need to consider how energy transitions can be implemented fairly in order to avoid societal discontent, by taking a broad approach to climate and energy policymaking and providing access to justice. Indeed, the policy goals are generally envisioned and realised at the national level. Yet, given the PA's bottom-up structure and the interactional space it creates the design and outcomes of national policies will be considered and reflected upon at the global stage. To facilitate this flow of information, the states parties need to ensure that the process of the global stocktake is able to receive a multitude of signals that can contribute to the evaluation of international climate cooperation.

The CBDR principle is closely related to the parameters of the triangular framework, especially to the concepts of climate justice and energy justice. The further development of climate cooperation under the UN climate regime will show whether the perception of the CBDR principle will be determined by its role in the Kyoto process or in its refined interpretation under the PA. If states parties will succeed in considering the parameters of the triangular framework in their operationalisation of the CBDR principle, it might be able to function as a principle of good global environmental governance and influence international environmental law beyond the UN climate regime.

No doubt, the PA does not include any provision that determines how states parties have to design policies substantively. However, the Katowice Rulebook provides detailed rules concerning the information requirements that will feed global exchange. The review procedures, together with peer pressure, could then result in more substantive deliberations, if relevant states parties – preferably large emitters – lead by example in accepting recommendations.

The restructured UN climate regime offers states parties considerable room for manoeuvre to pursue domestic priorities as part of their mitigation commitments. The refined CBDR principle allows developing states to evoke hardships in implementing mitigation action and ask for support

for meeting emissions reduction and adaptation goals. However, the 2018 IPCC special report with its analysis of a world under 1.5˚C global warming puts enormous pressure on developing states that are large emitters of greenhouse gases to explain the urgency of "national circumstances" that they might cite as obstacles to the implementation of far-reaching emissions reduction policies. Hence, the interactional space that the global stocktake creates has the potential to bring together various issues and considerations regarding the design of climate and energy policies, which the preceding chapter six and this subsection discussed.

The decisions of the Katowice Rulebook seek to ensure that the interests and specific circumstances of developing states are taken into account during the states parties' deliberations. The parameters of international climate cooperation of the triangular framework that this section proposes can help the parties to make choices and balance policy goals at the national level and then present these choices for review and exchange at the global level as part of the global stocktake. If the parties, based on the debates and information gathering of the review and stocktake procedures, will be enabled to coordinate policies to mitigate climate change in a meaningful way, the UN climate regime will have made considerable progress. In that case, the role of the redefined CBDR principle will also be able to fulfil its role as a principle of good environmental governance.

Understanding the structure of climate cooperation that the PA establishes is vital. The discourses that shape the components of the triangular framework will continue to evolve and adjust the parameters of international climate cooperation. As long as the states parties are willing to appreciate the interdependence and relevance of all components of this framework as basis for forward-looking climate cooperation, the UN climate regime will be able to improve substantively over time and thrive as the predominant, substantively most comprehensive international regime that coordinates global climate action and conveys obligatory force.

7.5. Concluding remarks

The topic of this chapter was the evolution of the CBDR principle in the UN climate regime during the period from 2005 to 2015. The chapter presented a comprehensive analysis of the CBDR principle in the PA and the role that the principle played in re-configuring international climate cooperation. The analysis relied on theories and insights from legal scholarship, constructivist IR research, and energy research in social sciences. By pursuing this interdisciplinary approach, the chapter answered the second part of the research question that this dissertation posed: How did experiences from domestic climate and energy legislation contribute to a substantive bottom-up reconstruction of the

UN climate regime; and *how does this reconstruction relate to the CBDR principle*? In fact, the reinterpretation of the CBDR principle was an essential precondition for reconstructing the UN climate regime.

To develop its argumentation, the chapter deployed three perspectives. It considered the CBDR principle's cycle of normative change from 2005 to 2015. Thus, the chapter first examined how over the years textual changes in the formulation of the principle in COP decisions eventually resulted in the principle's refined formulation in the PA by adding the qualifier "in the light of different national circumstances" to the CBDR principle.

This qualifier links national and international spheres of rulemaking on climate action. The reformulation of the CBDR principle was closely linked with the shift to a bottom-up approach to determining mitigation targets. No doubt, it would have been impossible to move to a bottom-up formulation of mitigation action without reconsidering the CBDR principle's definition prior to the Paris COP in 2015. The refined CBDR principle thus enables a re-conceptualisation of international climate cooperation.

Then, the second perspective of this chapter's analysis shed light on the legality of both the mitigation provisions and the operationalisation of the CBDR principle in the PA. This analysis was based on the interactional theory of international law, as developed by Brunnée and Toope. This examination revealed that the refined principle enhances the "thickness" of the UN climate regime's legality, which not only pertains to procedural aspects but also concerns substantive matters.

Together with the bottom-up approach to mitigation action, this achievement can promote long-term international climate cooperation. Furthermore, the refined CBDR principle helps to reconcile the regime with general tenets of international environmental law, as it endorses a more conventional approach to differential treatment. In addition, the development and role of the CBDR principle in the UN climate regime demonstrates that the principle needs to evolve within and in accordance with each individual MEA to retain its relevance.

This chapter aligned the differentiation storyline with the findings on the entry of decarbonisation concept into the UN climate regime that chapter six presented. In this chapter, it became obvious how both storylines have dovetailed in the course of the UN climate regime's history and how they relate to each other. This correlation was considered at several stages in the climate negotiations from 2005 onwards that led to the redefinition of the CBDR principle. This process can be best understood as a cycle of normative change during which the parties contest the interpretation of a norm and – following sometimes time-consuming argumentation and debates

about precedents – arrive at a new interpretation of the norm in question. This process reconstructs the normative environment. The visualisation helped to imagine this process as a spiral, moving the normative structure onto a higher level.

Substantive aspects of climate cooperation relate to the triangular framework that this chapter proposed, based on the PA's provisions. Indeed, the PA set salient parameters for international climate cooperation – including the precautionary concept and the concepts of climate justice and resilience and energy justice and security. It is important to acknowledge the inclusion of these concepts in the PA. Future action under this treaty will show to what extent the states parties will embrace the concepts of the triangular framework.

The chapter also examined how the redefinition of the CBDR principle in the UN climate regime is reflected in the provisions of the PA that regulate mitigation, adaptation, finance and technological support, and capacity-building and, based on this examination, how the refined principle influenced the legality of the regime. This assessment relied on the interactional theory of international law that Brunnée and Toope developed, utilising Fuller's eight criteria of legality.

The assessment considered first the legality of the rules on mitigation that the PA and the decisions of the Katowice Rulebook include. Then, the criteria of legality were applied to the operationalisation of the CBDR principle. The assessment of the mitigation provisions revealed a thicker substantive legality of the UN climate regime. However, the procedures of the Katowice Rulebook involve some imprecision regarding the operationalisation of differentiation. In the future, loose formulations of norms might again lead to contestation about the interpretation the CBDR principle in the respective contexts. It goes without saying, that the parties do not have time for further rounds of normative change, if they are serious about the 2˚C limit to global warming and the goal of achieving carbon neutrality after 2050.

The time dimension relates to the topic of this chapter in different ways. Twenty years after the adoption of the Berlin Mandate, the parties to the UNFCCC made the second attempt to dovetail the need for differentiation among the parties with measures to combat climate change. It took them ten years of difficult climate negotiations to arrive at this outcome – a process that this chapter described as a cycle of normative change.

The time dimension also relates to the goal of achieving carbon neutrality after 2050. Previous experiences with international climate cooperation showed how much time is wasted when the task that needs to be fulfilled is only vaguely conceptualised. It remains to be seen how the states parties, after having achieved so little during the preceding three decades, approach the task of arriving at

net-zero emissions after 2050. Decarbonisation pathways will have to take into account that this transformation ultimately will lead to a society and economy that relies on carbon-neutral processes to generate energy. The time to start thinking about the norms and institutions of this future is ticking away.

The dimension of imagination particularly concerns the triangular framework that emphasises a broad perspective of climate cooperation. The components of the framework derive from the provisions of the PA. It will depend on the willingness, responsibility, and creativity of the states parties how the parameters that form the triangular framework will be reflected in the implementation of the PA, including the assessment of parties' NDCs.

The redefinition of the CBDR principle, together with the NDCs, opens more avenues for participation than the previous top-down structure. From the outset, the CBDR principle has played a vital role in the development of the UN climate regime. Its inclusion in the UNFCCC contributed to the effectuation of procedural equity between developed and developing states. It facilitated the establishment of the UN climate regime and, subsequently, the reconstruction of the regime during the regime's the maturing phase. Throughout the UN climate regime's evolution, the CBDR principle displayed a considerable degree of adaptability. This was eventually affirmed by the re-formulation of the principle and its operationalisation in the PA. This adjustment played a decisive role in enhancing the legality of the UN climate regime. The CBDR principle's contribution to the reconstruction of the UN climate regime, proved the depth of the principles' meaning and its functionality as a principle of good environmental governance in different phases of an MEA's development. This finding confirms the second hypothesis of this dissertation.[263]

The CBDR principle continues to fulfil a vital role in the UN climate regime. With the qualifier "in the light of different national circumstances," the refined CBDR principle creates an equitable interactional space for substantive exchange between states parties, which can be brought into practice through various instruments such as the global stocktake and review proceedings. If they decide to embrace this interactional space, the parties will be able to acknowledge and appreciate developments at different levels of rulemaking on climate change. This would eventually redefine international climate cooperation after a cycle of norm contestation.

[263] Second hypothesis: *In contributing to the bottom-up interaction of states parties, the CBDR principle functions as a principle of good global governance and preserves the legality of the UN climate regime*.

OUTLINE – CHAPTER EIGHT

International environmental law and a transition to uncertainty

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8.3. Outlook: Collecting ideas for an uncertain future 380

CHAPTER EIGHT

An inescapable conclusion:

International environmental law and a transition to uncertainty

"Für Pessimismus ist es zu spät." *

[It's too late for pessimism.]

Gernot Wagner, climate economist
August 2017

8.1. The UN climate regime: Arising legality and substance

This dissertation collected arguments to answer the question whether experiences from domestic climate and energy legislation contributed to a substantive bottom-up reconstruction of the UN climate regime and how this reconstruction related to the CBDR principle. The preceding chapters approached the task of finding an answer to this question in several steps.

The dissertation first considered the three concepts that had an ideational impact on the negotiation of both the UNFCCC and the Kyoto Protocol. By establishing the UN climate regime, the parties tried to integrate neoliberal market approaches, sustainable development, and distributive justice in an MEA that was set up to regulate international climate cooperation. These concepts introduced tensions into the regime, shaping both the development of differential treatment under the UN climate regime and the conceptualisation of pathways to mitigate climate change.

* Karl Gaulhofer, "Für Pessimismus ist es zu spät" [It's too late for pessimism], *Die Presse*, 28 August 2017.

In the analysis, the operationalisation of the CBDR principle in the Kyoto Protocol was put into perspective by considering the history of differential treatment in international environmental law. This discussion included both the debates about the position of developing states and their demands at the UN level during the 1970s as well as major steps to institutionalise international environmental law, such as the 1972 Stockholm Conference and the 1992 Earth Summit.

Other MEAs that were adopted contemporaneously with the UNFCCC and Kyoto Protocol showed a more practical or flexible operationalisation of differential treatment to facilitate the participation of developing states in solving global environmental problems. The rigid differentiation that the Kyoto Protocol applied to the commitments of developing and developed states was not mirrored in any of these MEAs. Therefore, the exemption of developing states from any further commitments under the Kyoto Protocol was met with great discontent.

This approach to differentiation resulted in a decade-long contestation. During the annual negotiations at the COPs, the parties finally found a wording that would reformulate the CBDR principle. Furthermore, the differing operationalisation of the CBDR principle related to different components of climate action also allowed for a more flexible and pragmatic approach to differentiation. In addition, the refinement of the CBDR principle, especially the inclusion of the phrase “in the light of national circumstances” links the domestic and international realms of lawmaking.

The reformulation and redefinition of the CBDR principle created an opportunity for integrating bottom-up elements into the UN climate regime. The Paris Agreement, based on earlier “thought experiments” in COP decisions, relied on nationally determined contributions to structure the commitments of the states parties. Prior to the adoption of the Paris Agreement in late 2015, the parties submitted their NDCs that mainly consisted of the their policies and legislation to pursue the low-carbon energy transition and emissions trading schemes. In most states, some form of climate strategy or renewables legislation had been adopted by 2015. The conceptualisation of decarbonising electricity generation, which generally formed the first step to commence the low-carbon energy transition, largely depended on national socio-economic circumstances. Moreover, the domestic regulatory situation, including the state of the legal system, also determined the speed and extent of climate action in the power sector.

The tool of the NDCs forms the link between national climate action and the global assessment of the climate situation. The UN climate regime embraced domestic conceptualisations of pathways to climate change mitigation. This enables an interaction between the states parties that can inform

the (further) substantive legal development of the regime. Hence, the refinement of the CBDR principle was key to the restructuring of the UN climate regime. Its reformulation acknowledged the need for a bottom-up input of domestic action.

However, the Paris Agreement also establishes some top-down avenues to monitor and evaluate domestic action. It creates a transparency framework and introduces a regular assessment through the global stocktake. The decisions of the Katowice Rulebook detail the rules to implement the mitigation provisions of the Paris Agreement. The analysis of the decisions of the Katowice Rulebook revealed some imprecision in the way it approaches differential treatment. Disagreements about the interpretation of some rules in the Katowice Rulebook might have the potential to lead to renewed contestation.

The evaluation of the Paris Agreement from the broader perspective of international climate cooperation shows that it goes beyond the initial ideational basis of the UNFCCC and Kyoto Protocol that were mainly influenced by the three concepts of market approaches, sustainable development, and distributive justice. In fact, the provisions of the Paris Agreement, together with Decision 1/CP.21, refer to other vital concepts – such as climate justice and resilience, precautionary action, energy justice and security – that form parameters of international climate cooperation under the Paris Agreement. Visualised as a triangular framework, the parameters convey the necessity to design and implement climate measures in a balanced way. In the Paris Agreement's proposal to substantiate international climate cooperation, the Kyoto Protocol's prescription of cost-effectiveness and market-based approaches is missing, which is just another correction of this treaty's flaws.

This dissertation assessed the legality of the UN climate regime as part of its analysis, based on the criteria that Brunnée and Toope propose in their interactional theory of international law. The examination of the legality of the Paris Agreement's provisions showed an improvement in comparison with the evaluation of the Kyoto Protocol. However, the analysis of the mitigation provisions revealed that the concept of decarbonisation had not yet become a shared understanding of all parties when the Paris Agreement was adopted. The interaction as part of the global stocktake will probably lead to more coherence after these instruments will be used by the parties. However, the next concept – carbon neutrality – already looms on the horizon.[2] From a substantive perspective the conceptualisation of this term and necessary international measures to realise a net-zero global

[2] Section 2.1. of chapter two explained the concept of carbon neutrality and its relation to decarbonisation.

economy during the second half of the 21st century could possibly emerge as lynchpin of future contestation.

The assessment of the legality by using the eight criteria, defined by Fuller, proved to be a useful approach for evaluating the legal development of an international regime that consists of several treaties and decisions, both from a procedural and substantive perspective.

For any future assessment of the UN climate regime, it is vital to take into account this regime's legacy as an MEA and the important role that principles and concepts of international environmental law have played in the regime's development, especially the CBDR principle. This advice is warranted, as some seem to consider "climate law" as an evolving field of international law. Although the mitigation of climate change will alter the *socio-economic* fabric of today's society, the field of law from which its regulation is derived ought to be international environmental law, including the precautionary concept, the principles of this field of law, and procedural and substantive guarantees for the consideration of developing states' interests.

The consideration of the role of the CBDR principle at different stages of the UN climate regime's revealed that the principle's elasticity facilitated the reconstruction of the regime and underscored the function of the CBDR principle as a principle of good global governance. Its guidance in the course of the regime's evolution preserved the legality of the UN climate regime, as the regime added the Paris Agreement to is substantive provisions.

This treaty accepted the concept of decarbonisation. Indeed, decarbonising energy generation and the subsequent transition to a net-zero emissions economy constitute a large-scale socio-economic transformation. The Paris Agreement has the potential to emerge as a platform to coordinate this transformation at the global level. If followed up, the parameters of the triangle framework would enable the parties to move environmental concerns to the centre of economic policy and decision-making and ensure global environmental security. The parties would thus realise a fundamental premise that Maurice Strong, the convenor of both the 1972 Stockholm Conference and 1992 Earth Summit, considered as the main task of international environmental cooperation.[3] The parties to the UN climate regime can still prove that decades of negotiations and lawmaking to regulate salient environmental matters have not been spent in vain.

[3] *See*, Strong, Maurice F., "ECO '92: Critical Challenges and Global Solutions," *Journal of International Affairs* 44, no. 2 (1991): 290, 293.

8.2. Constructing energy futures in a climate-constrained world

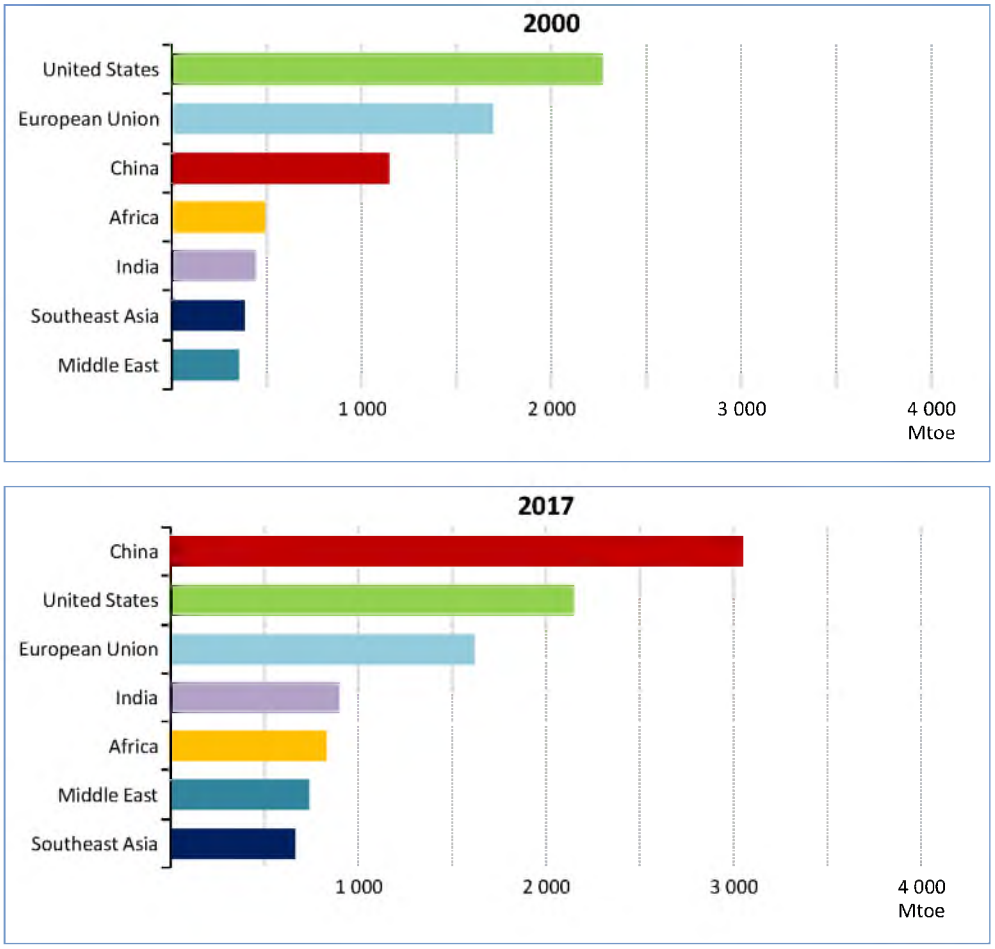
In the years since the adoption of the Paris Agreement, the global conversation about climate change mitigation followed hopeful and discouraging trajectories. The introduction to this dissertation in chapter one mentioned numerous instances of extreme weather conditions that occurred during the second half of 2018. Indeed, for many people in all parts of the world climate change has become a real threat. The 2018 IPCC report clearly related such weather events to climate change. Furthermore, the Fridays for Future movement of pupils around the world put great pressure on decision makers to take meaningful action.

Will this urgency soon be reflected in forward-looking decarbonisation measures? To conclude the evaluation of energy legislation and policy, this section briefly discusses domestic developments in the EU, U.S., and China. They will remain the largest consumers of energy for the time being (*see* figure 8.1). Therefore, their fuel choices and measures to reduce CO_2 emissions that they plan to implement will be key to global climate change mitigation.

Furthermore, the consideration of the reconstruction of the UN climate regime showed that the regime, given the hybrid architecture that the Paris Agreement introduces, will continue to depend on input from national legislative and policy approaches. Therefore, the discussion of national legislative and policy approaches to decarbonise economic activity needs to be part of the debate about the UN climate regime's future.

The aim of this section is to identify trends in the EU, U.S., and China that were shaping their energy futures five years after the Paris Agreement. It is beyond the scope of this post-script and this dissertation to include all legislative, policy, and judicial developments. Instead, the following remarks consider a few observations that stand out.

Figure 8.1: Annual energy demand of major energy consumers in 2000 and 2017 (in million tonnes of oil equivalent, Mtoe)



Source: **IEA, *WEO 2018* (online), pp. 4, 5.**

The first observation concerns the implementation of the Energy Union in the EU. As already mentioned, this major policy proposal was announced in February 2015. The main thrust of this proposal was the integration of EU energy and climate policies in anticipation of the Paris Agreement. Subsequently, the European Commission published an energy and climate law package that would implement the Energy Union in 2016. The directives and regulations were eventually adopted in 2018 through mid-2019. The "Clean Energy for All Europeans" package includes two directives[4] and four regulations[5] that relate to the electricity sector.

[4] Directive (EU) 2018/2001 the European Parliament and of the Council on the promotion of the use of energy from renewable sources (recast), OJ L 328, 21.12.2018, pp. 82–209; Directive (EU) 2019/944 of the European Parliament and of the Council on common rules for the internal market for electricity and amending Directive 2012/27/EU (recast), OJ L 158, 14.6.2019, pp. 125–99.

The Clean-energy package implements the 2030 EU climate framework that was published in 2014.[6] The 2030 EU climate framework builds on the 20-20-20 targets[7] that had to be achieved by 2020[8] and sets a 40% greenhouse gas emissions reduction target for 2030, compared to 1990. Furthermore, 32% of the Union-wide energy consumption should rely on renewables by 2030. The member states are allowed to set their own national objectives.[9] This implies that the share of renewable energy sources in the electricity generation will rise from 21% in 2014 to at least 45% in 2030.[10] The targets dovetail with the NDC that the EU had submitted to the UNFCCC secretariat in 2015.[11]

The European Commission pursued a holistic approach to implement its 2030 framework in the sense that it not only integrated climate and energy legislation but also established a new governance structure to implement the energy and climate legislation. Regulation 2018/1999 stipulates the rules for the governance structure of the Energy Union. This governance structure is based on five dimensions – i.e. energy security, the internal energy market, energy efficiency, decarbonisation, and research, innovation, and competitiveness.[12] Furthermore, the EU seeks to achieve a "socially acceptable and just transition to a sustainable low-carbon economy," while "taking into consideration citizens on whom and regions on which the transition to a low-carbon economy could have adverse impacts."[13]

To implement and coordinate legislative developments in the member states, "integral national energy and climate plans"[14] that cover ten-year periods have to be provided by the member states. They are also required to take into account the five dimensions of the Energy Union.[15] Pursuant to Article 7 of Regulation 2018/1999, the plans have to describe existing and planned policies and

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[5] Regulation (EU) 2018/1999 of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 the European Parliament and of the Council, OJ L 328, 21.12.2018, pp. 1–77; Regulation (EU) 2019/943 of the European Parliament and of the Council on the internal market for electricity (recast), OJ L 158, 14.6.2019, pp. 54–124; Regulation (EU) 2019/941 of the European Parliament and of the Council on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC, OJ 158, 14.6.2019, pp. 1–21; Regulation (EU) 2019/942 of the European Parliament and of the Council establishing a European Union Agency for the Cooperation of Energy Regulators (recast), OJ L 158, 14.6.2019, pp. 22–53.
[6] European Commission, "A Policy Framework for Climate and Energy in the Period from 2020 to 2030," 22 January 2014, COM(2014) 15 final, pp. 1–18.
[7] European Commission, "20 20 by 2020: Europe's Climate Change Opportunity," 23 January 2008, COM(2008) 30 final, pp. 1–12.
[8] European Commission, "A Policy Framework for Climate and Energy in the Period from 2020 to 2030," 2014, p. 3.
[9] Ibid., p. 5.
[10] Ibid., p. 6.
[11] The legislative package was announced in the NDC that EU submitted to the UNFCCC registry in 2015. *See*, Submission by Latvia and the European Commission on behalf of the European Union and Its Member States. "Intended Nationally Determined Contribution of the EU and Its Member States." 6 March 2015, http://www4.unfccc.int/ndcregistry/ PublishedDocuments/European%20Union%20First/LV-03-06-EU%20INDC.pdf, p. 3.
[12] Article 1 (2) (a) to (e) Regulation 2018/1999.
[13] Regulation 2018/1999, recital 19.
[14] Article 3 (1) Regulation 2018/1999.
[15] Regulation 2018/1999, recital 25.

measures to achieve the five dimensions. The European Commission will "be assisted in its tasks under this Regulation by a Climate Change Committee." [16]

The Clean-energy package is applicable from January 2020 onwards. The package continues the trend towards centralisation of climate and energy policy at the EU level, which was identified in chapter five. However, this only partially guarantees a smooth realisation of the objectives of Union-wide legislation. Despite the fact that member states participate in the legislative processes, it is important to note that, when implementing energy and climate legislation, national laws and regulations often render the EU measures ineffective. They might, for instance, impede price signals to promote investments in renewables or other low-carbon measures. Thus, to fully effectuate EU legislation member states would often need to reassess tax and levy regulations, which prolongs the implementation process considerably.[17]

By the end of the 2010s, the member states faced formidable challenges when they were implementing the next stage of the low-carbon transition in order to realise even deeper emissions reductions. The need to reconcile climate policies with national economic trajectories proved to be an arduous task. Moreover, member states once again encountered the problem that low-carbon policies interacted with each other and produced adverse results. For instance, the planned phaseout of coal in Germany by 2038 would most likely increase CO_2 emissions for two reasons. First, the gradual reduction of coal-fired capacity would allow still remaining coal-fired plants in Germany to produce more profitably due to rising prices. Second, as a result of the reduced coal-based capacity in Germany the price of EU ETS emissions allowances would drop. Coal-based producers in other EU member states would be able to produce electricity more cheaply than without the phaseout. A carbon price of €30 to 60 in Germany might reduce those effects, but that would be politically unacceptable.[18] Thus, a lot of fine tuning remains to be done in order to make the Energy Union work.

This is also true with regard to the European Green Deal[19] that the European Commission presented in December 2019. It contains a list of policy measures to transform the economies of the member states, including the goal of Union-wide carbon neutrality by 2050, a carbon border

[16] Ibid., recital 68.
[17] Pittel, Karen, "Wunsch und Wirklichkeit: Die langfristige Klimastrategie der Europäischen Union" [Desire and reality: The long-term climate strategy of the European Union], *ifo Schnelldienst* 72, no. 10 (2019): 16–7.
[18] Mark Thurber relates the renaissance of coal to the unique utility of coal in providing energy security. *See*, Thurber, Mark, *Coal*. Cambridge: Polity, 2019, 17–44; *see* also, "Kohleausstieg könnte CO2-Emissionen sogar noch steigern" [Coal phaseout could possibly even increase CO_2 emissions], *Welt*, 4 June 2019; Pahle, Michael, Ottmar Edenhofer, Robert Pietzcker, Oliver Tietjen, Sebastian Osorio, and Christian Flachsland, "Die unterschätzten Risiken des Kohleausstiegs" [The underestimated risks of the coal phaseout], *Energiewirschaftliche Tagesfragen* 69, no. 6 (2019): 1–4.
[19] European Commission, "The European Green Deal," 11 December 2019, COM(2019) 640 final, pp. 1–24.

adjustment mechanism to reduce the risk of carbon leakage through imports of manufactured goods, and a rapid phaseout of coal-fired electricity generation.[20] Poland, which is heavily dependent on coal-fired power plants, was reluctant to embrace the timeline during the Council meeting that decided on the Green Deal. Nevertheless, it eventually backed the goal of achieving carbon neutrality. [21]

No doubt, much has been achieved at the EU level in the course of streamlining EU legislation with the requirements of the Paris Agreement. In March 2020, the EU submitted the Union's long-term low greenhouse gas emission development strategy[22] to the UNFCCC, as required by Article 4 (19) of the Paris Agreement. The submission reiterates the goal of achieving carbon neutrality by 2050.[23] It also emphasises the need for the creation of a Just Transition Mechanism and the Union's concern for ensuring energy security and member states' right to determine their energy mix. The Union's international posture is highlighted by its intention to create a carbon adjustment mechanism. This mechanism seeks to guarantee that third countries that trade with the EU "adhere to the highest international environmental and safety standards."[24]

In the meantime, international climate cooperation was severely undermined when the Trump administration announced the withdrawal of the U.S. from the Paris Agreement in 2017.[25] The U.S. Department of State submitted an official notification regarding the withdrawal on 4 November 2019.[26] Pursuant to Article 28 of the Paris Agreement, the withdrawal is effective one year after its submission, which is one day after the presidential election on 3 November 2020. Some hoped that the outcome of the presidential election might reverse the Trump administration's move, framed in a statement by the new president-elect immediately after the election. Indeed, this would be an important gesture in support of the Paris Agreement and international climate cooperation. From a practical perspective, however, other developments in the U.S. will continue to be more relevant. This broader evaluation of the U.S. role in international climate cooperation is crucial when other states parties consider to reassess their support for the UN climate regime in light of the U.S. withdrawal. Indeed, the legal analysis of the Paris Agreement in section 7.3. of chapter seven

[20] Ibid., pp. 4–6.
[21] Morgan, Sam "EU Leaders Claim Victory on 2050 Climate Goal, despite Polish Snub," *Euractiv*, 13 December 2019.
[22] Council of the European Union, "Long-term Low Greenhouse Gas Emission Development Strategy of the European Union and Its Member States," Document 6612/20, 5 March 2020, pp. 1–6.
[23] Ibid., p. 2.
[24] Ibid., p. 5.
[25] The White House, "Statement by President Trump on the Paris Climate Accord," 1 June 2017, https://www.whitehouse.gov/ briefings-statements/statement-president-trump-paris-climate-accord/.
[26] U.S. Department of State, "On the U.S. Withdrawal from the Paris Agreement," 4 November 2019, https://www.state.gov/on-the-u-s-withdrawal-from-the-paris-agreement/.

suggested that responses to a state party's withdrawal need to be based on more components than government statements.[27]

In the U.S., the federal level thus far failed to implement legislation and policies to introduce nation-wide climate measures in the electricity sector. In 2014, the Obama administration adopted the Clean Power Plan. Based on the Clean Air Act, this plan aimed to reduce CO_2 emissions from power plants. If fully implemented by 2030, CO_2 emissions would have been 32% below 2005 levels.[28] The plan was immediately challenged in court. On 9 February 2016, following an application in the case *West Virginia, et al v EPA*,[29] the Supreme Court of the United States stayed the Clean Power Plan in early 2016.[30] After having been pending since 2015, the U.S. Court of Appeals for the District of Columbia eventually dismissed the consolidated cases of the Clean Power Plan litigation on 17 September 2019. This decisions was taken following the entry in to force of EPA's new Affordable Clean Energy rule on 6 September 2019.[31]

EPA had issued the Affordable Clean Energy rule in mid-2019 in order to replace the Clean Power Plan.[32] By issuing the Affordable Clean Energy rule, EPA refuted its previous stance concerning the scope of its leeway under the Clean Air Act, which reflected the Trump administration's approach to the coal industry.[33] The rule was also immediately met with court filings by 23 federal states and several big cites,[34] mainly because it would allow existing coal-fired power plants to operate indefinitely without any application of emissions reduction technologies.[35]

This course of events highlighted the constitutional constraints that might deprive the U.S. of federal policies and legislation to coordinate the reduction of CO_2 emissions in the electricity sector for the time being. Therefore, other actors than the federal government deserve more attention in

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[27] *See*, subsection 7.3.2.1.

[28] *See* for an overview of the main targets of the Clean Power Plan, EPA – Archive, "Overview of the Clean Power Plan: Cutting Carbon Pollution from Power Plants," 3 August 2015, https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-overview-clean-power-plan.html.

[29] *West Virginia v. EPA*, D.C. Cir., No -1363, 9/17/19; *see* for an assessment of the case, Heinzerling, Lisa, "The Supreme Court's Clean-Power Power Grab," *The Georgetown Environmental Law Review* 28, no. 3 (2016): 425–40

[30] Commentators interpreted the Supreme Court's decision to issue a stay as a sign that the Clean Power Plan would receive "a skeptical reception from the justices" as well. *See*, Liptak, Adam, and Coral Davenport, "Supreme Court Deals Blow to Obama's Efforts to Regulate Coal Emissions," *New York Times*, 9 February 2016.

[31] *See* for an overview of the proceedings, Office of the West Virginia Attorney General Patrick Morrisey, "State of West Virginia, et al. v. EPA, U.S. Supreme Court, No. 15A773," https://ago.wv.gov/publicresources/epa/Pages/No-15A773-.aspx.

[32] *See*, U.S. Environmental Protection Agency, "Affordable Clean Energy Rule," 19 June 2019, https://www.epa.gov/stationary-sources-air-pollution/affordable-clean-energy-rule.

[33] *See* for an assessment of the Affordable Clean Energy rule, Goffman, Joseph, and Caitlin McCoy, "EPA's House of Cards: The Affordable Clean Energy Rule," Harvard Law School – Environmental and Energy Law Program White Paper, 23 October 2019, http://eelp.law.harvard.edu/wp-content/uploads/ACE-Paper-Final.pdf, pp. 1–25.

[34] On 13 August 2019, New York Attorney General Letitia James filed a lawsuit in the U.S. Court of Appeals for the D.C. Circuit. She was joined by the AGs of 22 states – California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New Mexico, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, Washington, Washington, D.C., and Wisconsin, and the cities of Boulder, Chicago, Los Angeles, New York, Philadelphia, and South Miami. *See* for a summary of the reasons for filing the lawsuit, Friedman, Lisa, "States Sue Trump Administration over Rollback of Obama-era Climate Rule," *New York Times*, 13 August 2020.

[35] Larson, Erik, "States Sue Trump Administration over EPA's New 'Dirty Power' Rule," *Bloomberg*, 13 August 2019.

order to appreciate the position of the U.S. in the global climate change conservation and define a response to its withdrawal from the Paris Agreement.

Things to watch are legislative and policy developments at the state level and the fuel switch in the electricity sector as well as the transformation of the rest of the energy system. Indeed, legislators and policymakers at the subnational level continued to be the torchbearers of U.S. climate policy. These entities have emerged as "norm sustainers"[36] by incorporating the U.S. NDCs into their policies and amending existing laws. Furthermore, through disclosing their own progress towards initially announced U.S. climate targets they contribute to the global conversation on climate change.[37]

As suggested in chapter seven, in the case of a withdrawal from the Paris Agreement and declining political support at the national level other developments might help to determine whether the state party in question will be able to fully re-join international climate cooperation under the Paris Agreement at a later moment. It seems that, despite protests following the withdrawal, the majority of the states parties expects that the low-carbon transition in the U.S. will persist. For the time being, other states parties continue to support international climate cooperation under the Paris Agreement. They do not question the legality of the Paris Agreement in terms of the congruence of practice and required behaviour. This is a sign that the ongoing energy transition in the U.S. still contributes to upholding the shared understanding of decarbonising energy generation on which the Paris Agreement is built. Still, the low-carbon transition that is being realised in the power sectors in several federal states in the U.S. has yet to foster the ideational concept of combating climate change as a more comprehensive effort, including the need for international cooperation.[38]

Thus far, market signals have been driving the transformation of the U.S. energy sector. In 2019, for the first time, renewables supplied more electricity than coal in the U.S. In April, renewable energy sources generated about 68.5 million megawatt-hours (Mwh), eclipsing the amount of 60 million Mwh that was produced in coal-fired power plants during that month. Renewables provided 23% of total electricity generation, while coal's share was 20%. No doubt, the structure of April's power generation mix was the result of seasonal circumstances – i.e. weather conditions and

[36] Murthy, Sharmila L., "States and Cities as 'Norm Sustainers': A Role for Subnational Actors in the Paris Agreement on Climate Change," *Virginia Environmental Law Journal* 37, no. 1 (2019): 24.
[37] Ibid., 31.
[38] In Texas, investments in wind and solar installations, supported by federal tax programmes, have brought about structural changes in the economies of rural communities. Gradually, larger businesses are beginning to embrace the evolving energy landscape and support additional low-carbon policies. This is slowly changing the political debate about global warming. *See,* "Green Texas: A Renewable-energy Boom Is Changing the Politics of Global Warming," *The Economist*, 12 March 2020.

maintenance work at some power plants. However, it points to a decline of coal-based electricity in favour of more reliance on renewables. This shift was primarily brought about by inexpensive natural gas that negatively affected the economics of coal and the increasing availability of renewable energy sources across the country.[39] In fact, between 2010 and early 2019, more than 546 coal-fired power units retired, which amounted to 102 GW of generating capacity. It is expected that further 17 GW of coal-fired capacity will retire by 2025. Coal-fired power plants held the largest share (47%) of power plants that were retired during the past decade.[40]

Overall U.S. greenhouse gas emissions decreased by 13% since 2007 when emissions peaked. By 2019, emissions had fallen to roughly the level of 1992. The drop in emissions from the peak years during the second half of the first decade of the 21st century was largely achieved by steadily replacing coal with natural gas and renewables in the power sector. In this sector, emissions fell by 10% in 2019 compared to the previous year. Coal-fired power generation was 18% lower in 2019 than in 2018, which was the lowest level since 1975.[41] For the time being, in lieu of innovative legislative measures at the federal level, leaving the U.S. coal sector to market forces seems to be good for global climate change mitigation.

In 2019, coal-fired power plants were also in distress in China. Almost half of the companies were loss-making, mainly because coal-fired power plants saw their profits eroding by the increasing competitiveness of renewables and the regulation to prioritise grid access for renewables. It was expected that old and inefficient coal-fired power plants would be pushed out of the market in the near future.[42]

Furthermore, the first batch of 250 subsidy-free wind and solar projects of a total capacity of 21 GW were approved to be implemented in 16 provinces. This was a major step, because these projects would not have to rely on subsidies but would be able to match prices paid for coal. Electricity generated through these projects will have priority access to the grid, based on long-term contracts of at least 20 years at the benchmark price for coal-based electricity. Indeed, these examples points to some important changes in the Chinese power sector. However, the coal sector

[39] Martin, Chris, "For First Time, Renewables Surpass Coal in U.S. Power Mix," *Bloomberg*, 26 June 2019; U.S. Energy Information Administration, "U.S. Electricity Generation from Renewables Surpassed Coal in April," *Today in Energy*, 26 June 2019, https://www.eia.gov/todayinenergy/detail.php?id=39992.
[40] U.S. Energy Information Administration, "More U.S. Coal-fired Power Plants Are Decommissioning as Retirements Continue," *Today in Energy*, 26 July 2019.
[41] Wade, Will, "U.S. Emissions Fall after Utilities Ditch Coal in Favor of Gas," *Bloomberg*, 7 January 2020; Houser, Trevor, and Hannah Pitt, "Preliminary US Emissions Estimates for 2019," *Rhodium Group Note*, 7 January 2020, https://rhg.com/research/preliminary-us-emissions-2019/.
[42] Myllyvirta, Lauri, "Why China's CO_2 Emissions Grew 4% during First Half of 2019," *Carbon Brief*, 5 September 2019.

continued to receive substantial direct and indirect subsidies from the central and local governments.[43]

In addition, the power market reform that was proposed in 2015 was still ongoing. Major challenges remained – such as the grid interconnectedness, flexibility of generating capacity, and the functioning of market mechanisms.[44] In 2016, new measures were proposed in the 13th Five-year Plan (2016–20) for the development of China's energy sector (hereafter "FYP for energy").[45] It sets the goal of reducing the carbon intensity per unit of the GDP by 18% compared to 2015 levels.[46] Yet, the 13th FYP for energy also acknowledges significant deficiencies in the development of the electricity sector.[47] It specifically deplores the "bottlenecks" in the transmission of renewable electricity[48] from the main producing regions in the western and south-western parts of China to industrialised regions in eastern China.

The previously hyped introduction of a national emissions trading system, which had started trading as trial versions in several municipalities in 2013, also lost its traction. It will only be applicable to the power sector, which in itself would be a larger emissions trading market than the EU ETS.[49] However, the scheme will not introduce an overall cap on CO_2 emissions. Its allowances will be based on the carbon *intensity* of power plants rather than the plants' carbon emissions. Moreover, the launch of this trading scheme was deferred until 2020.[50] Local governments and enterprises, which are often owned by these governments, vehemently opposed the trading scheme, mainly because they feared that carbon-intensive industries might have to close following the introduction of carbon trading.[51] In January 2020, it was announced that the "breakthrough" on the *establishment* of the nationwide emissions trading scheme would take place by the end of the year.[52]

Despite the fact that the regulation of the power sector was marred by significant institutional weaknesses, one might wait in vain for the announcement of new legislation. The 13th FYP for energy, a 45-page document, only devotes three lines, filled with 72 characters, to the topic "A sound

[43] Ibid.; Myllyvirta, Lauri, and Fergus Green, "China's Carbon Emissions Trading Scheme: Smoke and Mirror," *The Interpreter*, 17 October 2019.
[44] Gosens, Jorrit, Tomas Kåberger, and Wang Yufei, "China's Next Renewable Energy Revolution: Goals and Mechanisms in the 13th Five Year Plan for Energy," *Energy Science and Engineering* 5, no. 3 (2017): 151.
[45] 能源发展"十三五"规划（发该能源 2016 年 12 月 26 日公开发布稿［2016］2744 号）[13th Five-year plan on energy development (National Energy Administration of the National Development and Reform Commission, 26 December 2016, public draft no. 2744 [2016]).
[46] Ibid., p. 14.
[47] Ibid., pp. 7–9.
[48] Ibid., p. 8.
[49] Wang Liwei, and Ren Qiuyu, "In Depth: How China's Emissions Trading Scheme Faltered," *Caixin*, 31 July 2019.
[50] Myllyvirta, and Green, "China's Carbon Emissions Trading Scheme," 2019.
[51] Wang and Ren, "How China's Emissions Trading Scheme Faltered," 2019.
[52] "China to Make National Carbon Trading 'Breakthrough' by Year-end: Official," *Reuters*, 14 January 2020.

system of energy legislation and regulation."[53] Thus, the low-carbon transition will most likely be further "governed" by ad hoc policy documents rather than legislation. Hence, powerful provincial and local governments and dominant, freewheeling state-owned enterprises retain much leeway to shape the development of China's electricity sector.

Any consideration of the development of global greenhouse gas emissions needs to take into account China's climate and energy and economic policies. After a brief suspense around 2015, China's greenhouse gas emissions continued to rise during the rest of the decade. The increase in CO_2 emissions was mainly caused by real estate and infrastructure construction. This industry thus replaced electricity generation as the main driver of China's CO_2 emissions growth.[54] In fact, China's leadership maintained economic growth through subsidies provided to construction and carbon-intensive industries. Amidst a dearth of official information,[55] China's overall greenhouse gas emissions were estimated to have increased by 2.6% in 2019, primarily driven by the use of fossil fuels, in particular oil and natural gas. This corresponds with the average annual increase of 3.0% during the 2010s. Coal use continued to grow by 1% in 2019.[56]

The 14th Five-year Plan (2021–5) will provide a glimpse of the further trajectory of China's power sector. In early 2020, stakeholders in the coal industry and large state-owned enterprises in the electricity sector were pressing for a further increase in the country's fleet of coal-fired power stations. Recent statements by the leadership seemed to support the central role of coal in China's electricity mix, acknowledging the political influence of those segments of the economy that rely on the country's vast coal sector.[57] Hence, as long as the central leadership will delay the adoption and implementation of structural economic reforms and continues to promote coal-fired power generation, the country's CO_2 emissions are unlikely to decline.

This overview of recent developments in the EU, U.S., and China unveils a diversity of energy futures and governance approaches. It goes without saying, that policies adopted in these three jurisdictions will not converge to a shared understanding that might hint at a common approach to the low-carbon transition. Despite hopeful signs, when implementing further measures to reduce or limit

[53] 13th Five-year Plan on energy development, 2016, p. 43.
[54] Myllyvirta, "Why China's CO_2 Emissions Grew 4% during First Half of 2019," 2019.
[55] The last numbers regarding China's greenhouse gas emissions on the UNFCCC website date from 2014. *See*, UNFCCC – GHG Profiles: Non-Annex I, "Emissions Summary for China," https://di.unfccc.int/ghg_profiles/nonAnnexOne/CHN/CHN_ghg_profile.pdf.
[56] Grant, Mikhail, and Kate Larsen, "Preliminary China Emissions Estimates for 2019," *Rhodium Group Note*, 18 March 2020, https://rhg.com/research/preliminary-china-emissions-2019/.
[57] Myllyvirta, Lauri, Zhang Shuwei, and Shen Xinyi, "Analysis: Will China Build Hundreds of New Coal Plants in the 2020s?,"*Carbon Brief*, 24 March 2020, https://www.carbonbrief.org/analysis-will-china-build-hundreds-of-new-coal-plants-in-the-2020s.

their emissions all three jurisdictions continue to face profound economic, political, and institutional challenges. Contemplating and realising a global low-carbon energy future remains a thorny issue.

8.3. Outlook: Collecting ideas for an uncertain future

In 2017, after annual emissions growth rates had come to a halt during the preceding two years, global greenhouse gas emissions began to rise again. This was primarily the result of an increase of 1.2% in both CO_2 and methane emissions. In 2017, global CO_2 emissions reached a total of 37.1 Gt.[58] Thus, 25 years after the adoption of the UNFCCC the level of CO_2 emissions was 65% higher than in 1990,[59] which formed the baseline year for calculating emissions reduction commitments. Wouldn't it just be realistic to assess the ensuing climate cooperation under the Paris Agreement with a sense of foreboding?

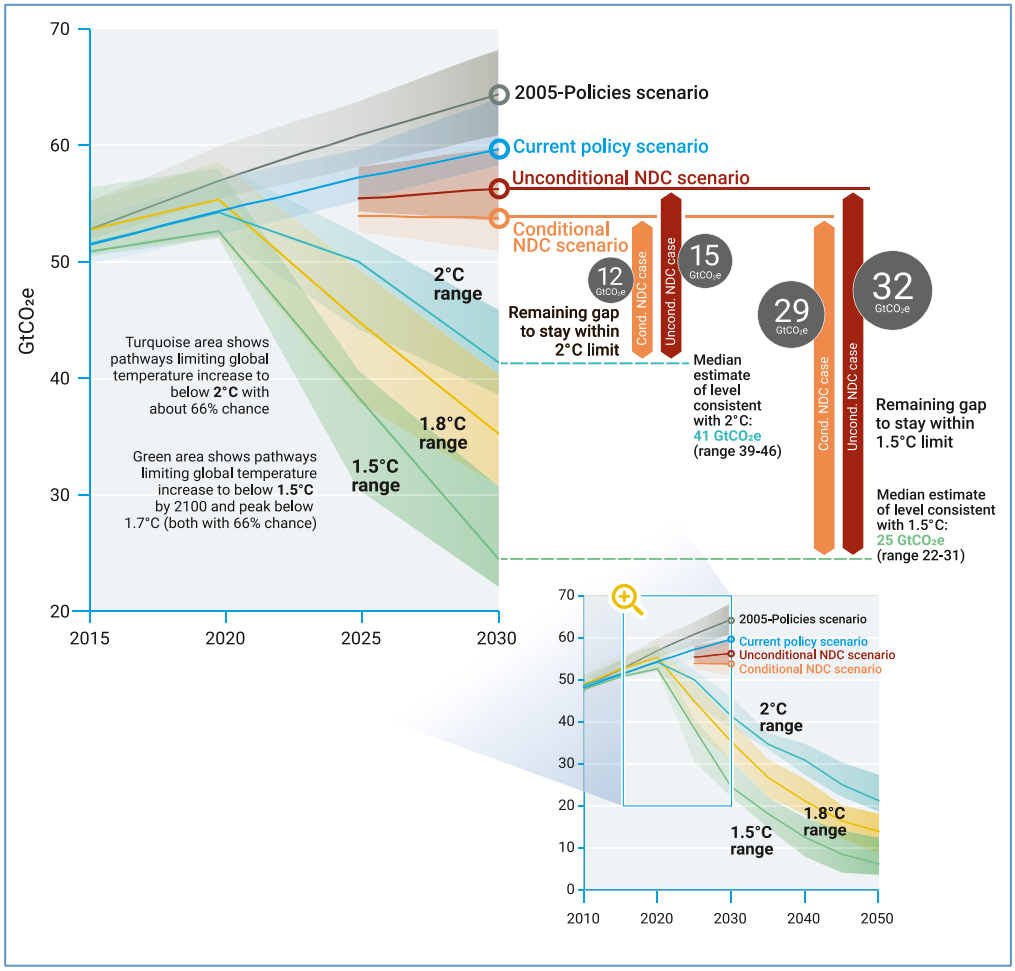
When reviewing the journey of the UN climate regime, this dissertation focused on the regime's legal and substantive development. However, it would be dangerous to ignore the outcomes of the cooperation that the regime regulates. The UN climate regime was based on forward-looking concepts. The assessment in this dissertation showed that three ideas influenced the cooperation under the UN climate regime that reflected the zeitgeist of the 1990s: The parties sought to translate sustainable development, the priority of market forces, and a notion of distributive justice into rules that would guide the international community in its fight against global warming. These ideas influenced the structures and provisions of the UNFCCC and Kyoto Protocol as well as first attempts to implement emissions reduction commitments.

At that time, however, Earth was already in danger of getting too hot for humankind's survival. A final graph illustrates the trajectory that the planet faces as the 21st century is proceeding (*see* figure 8.1). It shows that the NDCs, which the parties submitted in 2015 as part of their cooperation under the Paris Agreement, will fail to bring the global emissions picture anywhere near the 2°C threshold that this treaty states as one of its objectives. In order to follow the pathway that limits global warming to 1.5°C, the international community would have to radically decarbonise economic activity and almost achieve carbon neutrality by about 2050. By the end of 2019, none of the NDCs that the 20 states with the largest economies (G20) had submitted was on track to achieve the 1.5°C

[58] PBL Netherlands Environmental Assessment Agency, "Trends in Global CO2 and Total Greenhouse Gas Emissions – Report 2018," December 2018, https://www.pbl.nl/sites/default/files/downloads/pbl-2018-trends-in-global-co2-and-total-greenhouse-gas-emissons-2018-report_3125_0.pdf, p. 5.
[59] Ibid.

goal.[60] Obviously, much more ambitious climate measures will be necessary, in particular by large emitters, to give humankind a chance to close the gap between the states parties' first NDCs and what is needed to accomplish a significant limitation of global warming.

Figure 8.2: Global greenhouse gas emissions under different scenarios and the emission gap in 2030



***Source*: UNEP, 2019 (online), p. 26.**

In addition, it is vital that the concept of carbon neutrality is further defined. The dramatic societal impact that a transition to a net-zero emissions economy will eventually have needs to be appraised. Far-reaching social, economic, and technological adjustments will have to be realised within only three decades.

[60]Climate Transparency, "Brown to Green: The G20 Transition towards a Net-zero Emissions Economy," November 2019, https://www.climate-transparency.org/wp-content/uploads/2019/11/Brown-to-Green-Report-2019.pdf, p. 19.

By mid-2019, the urgency to act had been increasing. During the 2019 Climate Summit in New York more than 60 states announced that their economic strategies are being geared to achieving the goal of carbon neutrality by 2050. However, these states' emissions only presented 11% of the global total. Big emitters did not commit to achieve zero carbon emissions anytime soon.[61] Furthermore, the announcements did not include precise steps of how to realise this goal. Even for small economies considerable investments will be needed to re-invent the energetic basis of economic activity or treat CO_2 emissions in a way that they can be counted as net-zero emissions. Technologies that were available by 2019, such as carbon capture, utilisation and storage (CCUS), only existed as trial versions and were not ready for economy-wide application.

Nevertheless, announcing the net-zero emissions goal was important, mainly because it stressed the need to re-focus the climate debate. This debate not only involves measures to promote the low-carbon transition of the energy sector. After having reluctantly conceptualised a path to decarbonisation and emissions reductions, the task that the international community will face in the coming decades will go far beyond this initial approach. The notion of carbon neutrality suggests a much more profound transformation.

Throughout this dissertation, three dimensions guided the reflection on the findings about the UN climate regime's development. The dimensions weigh even heavier in the context of carbon neutrality. The conceptualisation of the path to carbon neutrality faces a considerable *time* constraint. During the second half of the 2010s, most states still reported rising emissions.[62] Designing policies to reverse course and move towards carbon neutrality will take time. The states will at best only have two decades to implement these policies.

[61] The list excludes China, the U.S., and India. The United Kingdom, France, and Germany made net-zero pledges. *See*, Farand, Chloé, and Natalie Sauer, "This Is What the World Summit Promised at the UN Climate Action Summit," *Climate Home News*, 2 October 2019; "More than 60 Countries Say They'll Zero out Carbon Emissions. The Catch? They're not the Big Emitters," *New York Times*, 25 September 2019.
[62] CO_2 emissions in the EU and U.S. were decreasing, while they were rising in China, India, Indonesia, and other developing states. *See*, PBL, "Report 2018," 2018, pp. 5–6.

The dimension of *imagination* points to the fact that, by the end of the second decade of the 21st century there was no large-scale application for industrial installations that operated in a carbon neutral way. How can cement or steel be produced in a carbon neutral world? Can we live without cement and steel? It is difficult to imagine a carbon neutral economy and society without a viable technological pathway. Drafting rules for this unprecedented socio-economic transformation will require visionary debates among all stakeholders in order to arrive at a workable strategy.

The conceptualisation of decarbonisation pales in comparison with the *complexity* that will involve these debates. Needless to say, the parameters of climate cooperation, that the Paris Agreement suggests – as visualised in the triangular framework in chapter seven – are also relevant to the implementation of net-zero emissions measures. The path to carbon neutrality will ideally be based on the precautionary concept and balance considerations of climate justice and resilience and energy security and justice. In addition, and at this point the goal of carbon neutrality really goes beyond the concept of decarbonisation, an alternative economic and regulatory framework will replace the rules, which guide economic activity, financial flows, and resource allocation in the fossil-fuel based global economy. Will we be able to disentangle our lives from the temptations of the fossil economy?

At the time of writing, a transition away from the institutions that facilitate the fossil economy had not yet been conceptualised; and no one could guarantee that this transformation will be possible without conflict. The geopolitics of oil and gas were still very much alive. Will all those *men* whose power rests on the fossil economy uncomplainingly relinquish their place in the global political economy? Immediate responses to the 2020 coronavirus pandemic point to decision-makers' priorities and reflex actions that are prevalent in the international community.

Textbox 8.1: Coronavirus pandemic and international climate cooperation

Uncertainty in a climate-constrained global political economy: A virus as catalyst

In April 2020, when this dissertation was being finished, an action by the G20 member states[1] once again stressed the pre-eminence of fossil fuels. By that time, the coronavirus pandemic, which had been spreading from China to the rest of the world since late 2019, had forced most states to shut down their economies and implement social-distancing measures. These steps coincided with a sustained decline in the demand for crude oil and a struggle for market shares among the world's largest oil producers – i.e. the U.S., Russia, and Saudi Arabia.[2] The global oil industry faced an unparalleled, immediate collapse. In April 2020, the demand for crude oil was 29 million barrels per day lower than a year earlier. The repercussions were expected to erase a decade of growth in the industry and would soon affect the industry's fiscal, financial, and logistic links with the rest of the global economy.[3]

International efforts were made to reduce global oversupply. The main oil producing states – convening as "OPEC+" – initially responded to an unprecedented drop in oil prices at the end of March when the price for a barrel of Brent crude, the industry's benchmark, fell more than 50%. Lingering below U.S.$23, the price reached an 18-year low. An oil deal was hastily concluded to rescue the global oil industry by stabilising the Brent price floor.[4] The G20 members endorsed this oil deal,[5] which was their first significant joint international response to the coronavirus crisis.[6]

No doubt, the pandemic exacerbated the uncertainty in the global energy sector – and the climate-constrained global economy in general. Oil-producing states were mainly concerned about maintaining production capacity and market shares, while oil-importing economies among the G20 members worried about high energy prices during a post-pandemic recovery, if indeed oil production capacity would soon be wiped out. However, some effects of shutting down entire economies entailed changes that would severely hamper the future development of the oil industry and, at the same time, contribute to the reduction of CO_2 emissions, such as large numbers of people engaged in remote work and learning, reduced international travel, and shortened supply chains for manufactured goods.[7] Thus, from the outset the terms that were included in the oil deal were unlikely to stabilise the oil industry. Instead, the coronavirus crisis and falling oil demand accelerated changes in the energy system, which, envisioned in climate policies, were expected to unfold in the near future.[8]

(continued)

Uncertainty in a climate-constrained global political economy *(continued I)*

Yet, the international community failed to address this moment of profound uncertainty comprehensively when, in early April 2020, it shelved plans for organising COP26 in Glasgow in November 2020.[9] During COP26, the states parties intended to debate their upgraded nationally determined contributions to the mitigation of climate change. Thus, the oil industry was assured of its survival, while the debate about future climate action was postponed until the following year.

Throughout 2019, massive climate protests in many countries demonstrated an increasing public awareness of global warming. Nevertheless, the prospects for international climate cooperation remain dim for two interrelated reasons. First, the coronavirus crisis highlighted the challenges that the international community faces when cooperation to a significant degree relies on official reporting and information from China. The Chinese leadership misrepresented the real scope of the crisis, both at home and in its communications with the international community. The coronavirus crisis exemplified the shortcomings of China's governance system. It creates incentives to report inaccurate information from lower levels of governance to higher ones, while the central government sets policy goals that do not take into account local realities,[10] which provided the breeding ground for the global pandemic. Second, this pandemic is going to wreak further havoc on the relations between the main parties to the UN climate regime. Recently, interactions between the EU, U.S., and China at the global level and in bilateral consultations have been marred by dissonance and distrust.

In its handling of the coronavirus crisis, the Chinese leadership concealed the origin and severity of the crisis from the Chinese people and the rest of the world, leading to a serious loss of trust regarding Chinese statistics and the leadership's willingness to share information and academic research outcomes. In fact, a directive, published by the Department of Science and Technology of the Ministry of Education, made all academic publications on the origin of the virus subject to approval by a task force under the State Council, China's central government.[11] This is no trivial matter.

When the international community will resume cooperation on other global problems of common concern, such as climate change, experiences from this most recent crisis will influence international affairs. How will the Chinese leadership's lack of transparency affect future climate cooperation, especially the assessment of national contributions under the global stocktake? Most likely, pre-crisis trends in international relations will continue to unfold and even accelerate.[12] Instances of forward-looking climate diplomacy accomplished by representatives of the EU, U.S., and China, which were essential at several junctures in the history of the UN climate regime, will become ever more elusive.

(continued)

Uncertainty in a climate-constrained global political economy *(continued II)*

The near future will show how lessons from governments' responses to the pandemic can help to further conceptualise global efforts to combat global warming. It will require great efforts to reconcile climate policies with the immediate economic response to the pandemic. A week after the historic oil deal was concluded, the world caught a glimpse of the magnitude of socio-economic turbulence that the coronavirus crisis would cause in the near future: The U.S. oil futures for deliveries in May traded negatively on April 20, as expressed in the Western Texas Intermediate benchmark. Thus, it was so unlikely that clients in downstream oil processing would be willing to buy the amount of oil entailed in these futures that traders, who would need to store the physical delivery of the crude oil somewhere, had to be paid as much as U.S.$40 per barrel.[13] This unprecedented situation pointed to severe doubts about the prospects for a quick recovery of the world's largest economy.

In any case, the coronavirus crisis will result in a new normal of the world economy from which policy choices will have to depart. Governments took extraordinary measures to contain the crisis and protect their national economies. Steps to re-start economic activity will also include fuel choices. Will policymakers be able to adhere to planned low-carbon transitions or will they be forced to resort to existing fossil-fuel based infrastructures, in order to ensure economic stability? At the beginning of the 2020s, the international community – after having been infected with an obscure virus – received harrowing market signals from the fossil economy, forecasting a prolonged period of global socio-economic upheaval. This turn of events bodes ill for societies' capacity to shield from the impacts of both global warming and the low-carbon transition.

Notes:

1 - The G20 comprise Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Republic of Korea, the Russian Federation, Saudi Arabia, South Africa, Turkey, the United Kingdom, the United States, and the EU.
2 - Yergin, Daniel, "The Oil Collapse: A Pandemic and a Price War Have together Brought Energy Markets to a Crisis," *Foreign Affairs*, 2 April 2020.
3 - See, International Energy Agency, "Oil Market Report – April 2020: Highlights," https://www.iea.org/reports/oil-market-report-april-2020.
4 - The OPEC deal includes a phased production cut of initially 9.7 million barrels a day, starting in May 2020. The production cut will gradually be lifted but continue until April 2022. See, OPEC, "The 10th (Extraordinary) OPEC and non-OPEC Ministerial Meeting Concludes," 12 April 2020, https://www.opec.org/opec_web/en/press_room/5897.htm; see also, David, Dhanshini, "Coronavirus: Oil Price Collapses to Lowest Level for 18 Year," *BBC*, 30 March 2020; "Fluctuons in the Oil Market: Upside down," The Economist, 8 April 2020; Sheppard, David, Anjli Raval, Derek Brower, and Henry Foy, "G20 Backs largest Oil Supply Agreement in History," *Financial Times*, 11 April 2020/.
5 - G20 - Saudi Arabia 2020, "G20 Extraordinary Energy Ministers Meeting Statement," 10 April 2020, https://g20.org/en/media/Documents/G20_Extraordinary%20Energy%20Ministers%20Meeting_Statement_EN_v1.pdf, pp. 1-2/.
6 - Editorial Board, "Oil Accord Highlights the New World Disorder," *Financial Times*, 13 April 2020.
7 - "Fluctuons in the Oil Market: Upside down," *The Economist*, 8 April 2020.
8 - "The OPEC Oil Deal: The Future of the Oil Industry," *The Economist*, 16 April 2020.
9 - UNFCCC – Press Release, "COP26 Postponed," 1 April 2020, https://unfccc.int/news/cop26-postponed.
10 - See, Romaniuk, Scott N., and Tobias Burgers, "Can China's COVID-19 Statistics Be Trusted?," *The Diplomat*, 26 March 2020; Yang Yuan, Liu Nian, Liu Qianfer, and Robin Yu, "Hidden Infections Challenge China's Claim Coronavirus Is under Control," *Financial Times*, 27 March 2020.
11 - See, Gan, Nectar, Caitlin Hu, and Ivan Watson, "Beijing Tightens Grip over Coronavirus Research, amid US-China Row on Virus Origin," *CNN*, 12 April 2020.
12 - Haass, Richard, "The Pandemic Will Accelerate History Rather Than Reshape It: Not Every Crisis Is a Turning Point," *Foreign Affairs*, 7 April 2020; Rodrik, Dani, "Will COVID-19 Remake the World," *Project Syndicate*, 6 April 2020.
13 - Brower, Derek, David Sheppard, Anjli Raval, and Gregory Meyer, "What Negative US Oil Prices Mean for the Industry," *Financial Times*, 21 April 2020.

Arguably, finding a path to overcoming the social effects that extended periods of coronavirus lockdowns caused might help to draw some lessons for future challenges. Societal resilience in the face of climate-change induced disruptions of social and economic life will be vital for all states. However, with frail economies that are coping with the aftermath of the coronavirus crisis the fiscal

room for manoeuvre to alleviate socio-economic challenges of the low-carbon transition will be limited. Decision-makers will face stark choices.

Furthermore, other than in the past energy security will be less dependent on the ability to prevail in geopolitical struggles for crucial resources. Instead, secure, affordable and environmentally sustainable energy supplies will largely depend on the quality of institutions. The needed adaptability of laws and regulation relates to climatic changes, societal preferences, economic pressures, and environmental requirements. The law will thus play a vital role in a climate-constrained world, mainly because it can stabilise society and facilitate the far-reaching transformation of the energy system in a meaningful way. Hence, lawyers need to be cognizant of the numerous complex issues that are involved in this transformation. Issues that most likely might arise during this transformation need to be acknowledged when rules are made and implemented.

One issue that we cannot afford to brush aside is the phenomenon of ecological grief.[63] This emotional state results from changing weather patterns and environmental degradation that is caused by global warming.[64] Ecological grief also relates to the change that evolving socio-technological landscapes bring about. These emerge as part of the energy transition, such as wind parks, photovoltaic installations, and vast transmission lines. Ecosystems and landscapes in rural areas are particularly affected by the large-scale deployment of renewable energy sources.

The case of the Saami reindeer herders, which was discussed in chapter two (*see* textbox 2.1), referred to the loss of identity, sense of place, and social bonds. The Saami communities in question felt the impact of climate change on their traditional way of life and were also affected by the construction of wind farms in their localities. Thus, experiences of loss often lead to ecological grief and are endured by communities that are confronted with the impact of climate change and/or measures to mitigate it. Rules that seek to foster climate resilience and their implementation will somehow need to recognise the various "losses" that local communities endure.

Clearly, none of these thoughts is reflected in the decisions of the Katowice Rulebook. In fact, its rules provide much room for inaction. The international community has just begun to establish an international framework that requires emissions reductions of all parties. Some large emitters will not even start reducing their emissions any time soon. In the coming years, the interaction among the parties, facilitated by the global stocktake and the review and transparency tools of the Paris

[63] This term points to grief that is felt related to experienced or anticipated ecological losses (species, ecosystems, meaningful landscapes) following acute or chronic environmental change. *See*, Cunsolo, Ashlee, and Neville R. Ellis, "Ecological Grief as a Mental Health Response to Climate Change-related Loss," *Nature Climate Change* 8 (2018): 275.

[64] *See* for various ways of experiencing loss, Tschakert et al, "Climate Change and Loss, as if People Mattered: Values, Places, and Experiences," *WIREs Climate Change* 8, no. 5 (2017): 1–19; Cunsolo Willox, Ashlee, "Climate Change as the Work of Mourning," *Ethics and Environment* 17, no. 2 (2012): 137–64.

Agreement, will show at which pace the international community can move towards the carbon neutrality goal.

The Paris Agreement allows the parties to choose their own policies and offers instruments to accelerate international climate action. After the deadlock that the rigid differentiation and insufficient climate measures of the Kyoto Protocol had created, the adoption of the Paris Agreement was an important step to continue international climate cooperation. Through the Paris Agreement's approach to climate cooperation, the UN climate regime gained in legality and substance. With the global stocktake and its provisions on transparency the Paris Agreement creates an interactional space that the states parties can use to discuss best practices and collect ideas for new and forward-looking strategies that help to mitigate further climate change.

By doing so, they might be able to strengthen the global coordination of climate measures. Nevertheless, even if used wisely, all these processes will take time before they can yield any results. Bold imagination might help the international community to find some creative solutions. But retaining control of complex socio-economic shifts and political conflicts, while reconciling people's fears and ecological grief will prove difficult. The Paris Agreement is just the beginning of a journey to rough and uncertain shores.

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United States of America

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DISSERTATION – SUMMARY

PhD candidate:
Susann Handke, LLM MA

supervisors:
Professor Dr Ellen Hey
Professor Dr Alessandra Arcuri

title:

The UN Climate Regime's Journey:
Contesting Legality and Constructing Substance

The dissertation examines the development of the UN climate regime. It follows two storylines that through mutual interaction shaped the legality and substance of the regime – differentiation and decarbonisation. These concepts embody the debates about differentiation of treaty parties' commitments and the conceptualisation of decarbonising economic activity to mitigate climate change. The dissertation presents the evolution of the UN climate regime in a novel theoretical framework, by deploying the interactional legal theory, as developed by Brunnée and Toope, as well as constructivist theories, which help to investigate the changes in the global political economy and the electricity sector in particular. This theoretical framework facilitates a comprehensive consideration of the main research question of how experiences from domestic climate and energy legislation contribute to a substantive bottom-up reconstruction of the UN climate regime and how this reconstruction relates to the principle of common but differentiated responsibilities (CBDR), one of the core principles of the UN climate regime. The dissertation argues that a meaningful reconstruction of the UN climate regime relies on the input of national legislative and policy approaches. Furthermore, as it contributes to the bottom-up interaction of the states parties, the CBDR principle functions as a principle of good global environmental governance and preserves the legality of the UN climate regime. The dissertation provides an in-depth legal assessment of the Paris Agreement and the decisions of the Katowice Rulebook, guiding the reader to the main findings in an accessible way.

DISSERTATIE – SAMENVATTING

PhD kandidaat:
mr. drs. Susann Handke

promotores:
professor dr. Ellen Hey
professor dr. Alessandra Arcuri

titel:

De zoektocht omtrent het VN-klimaatregime:
Tussen twijfels over rechtmatigheid en een materiële heroverweging

Dit proefschrift volgt de ontwikkeling van het VN-klimaatregime langs twee verhaallijnen – differentiatie en decarbonisering. Deze concepten hebben door onderlinge uitwisseling vorm gegeven aan de legaliteit en de materiële inhoud van het regime. Ze belichamen de debatten over differentiatie van verplichtingen van verdragspartijen en de uitwerking van het concept van de decarbonisering van de economie, die noodzakelijk is om de klimaatverandering tegen te gaan. Het proefschrift presenteert de ontwikkeling van het VN-klimaatregime in een nieuw theoretisch kader, door het toepassen van de interactieve juridische theorie, zoals deze is ontwikkeld door Brunnée en Toope, alsmede constructivistische theorieën, die – in het context van dit onderzoek – de beoordeling van de veranderingen in de mondiale politieke economie en in het bijzonder de verhoudingen in de elektriciteitssector verhelderen. Dit theoretisch kader maakt een grondige beschouwing van de onderzoeksvraag mogelijk. Het proefschrift geeft antwoord op de vraag hoe ervaringen met de toepassing van nationale klimaat- en energiewetgeving hebben bijgedragen aan een materiële heroverweging van het VN-klimaatregime; en hoe zich deze heroverweging verhoudt tot het beginsel van gemeenschappelijke en toch verschillende verantwoordelijkheden (CBDR). Dit beginsel vormt één van de kernbeginselen van het VN-klimaatregime. Het proefschrift concludeert dat de grondige heroverweging van het VN-klimaatregime daadwerkelijk berust op ervaringen met nationale wetgeving en beleidsvorming; en dat het CBDR beginsel de ruimte creëert die nodig is voor het betrekken van deze ervaringen in een internationaal juridisch context. Het CBDR-beginsel draagt bij aan de uitwisseling van de verdragspartijen op de basis van hun nationale ontwikkelings- en decarboniseringstrajecten en kenmerkt zich als een beginsel van goed mondiaal milieubestuur. Door deze rol te vervullen in het Akkoord van Parijs versterkt het beginsel de legaliteit van het VN-klimaatregime. Het proefschrift bevat een zorgvuldige juridische beoordeling van het Akkoord van Parijs en de besluiten van het Katowice Regelboek, en leidt de lezer op een toegankelijke manier naar de belangrijkste bevindingen.

CURRICULUM **VITAE**

Susann Handke

born:	1973
nationality:	Germany
degrees and certificates:	
	LLM – Dutch Constitutional and Administrative Law, 2010 MA – Sinology, 2008 LLM – International and European Law, 2005 汉语水平考试 一八级/HSK Mandarin Proficiency Test, level 8 (gives entry to Chinese-language-based university education in the PRC), 2007 NT3 – Dutch Proficiency Test, 1999 Berufsabschlußzeugnis (vocational training certificate), 1995 Abitur (university entrance diploma), 1992
experience:	
2005 – present	Draaktaal *co-owner and translator – Chinese-Dutch legal translations*
2012 – present	Erasmus School of Law, Department of International and European Union Law, Erasmus University Rotterdam *external PhD candidate – research into the development of the UN climate regime and its interaction with national energy legislation*
2010–2019	International Institute for Asian Studies, IIAS Centre for Regulation and Governance, Leiden *research associate*
2006–2008	Clingendael International Energy Programme, The Hague *research fellow*
2003–2006	Leiden University, Documentation Center for Modern China *editorial assistant at China Information (academic journal)*
1992–1995	Rechtsanwalt und Notar Dieter Höft, Raesfeld, Germany *professional training – paralegal*
education:	
2009–2010	Leiden University *Constitutional and Administrative Law*
1999–2005	Leiden University *International and European Law*
1998–2002	Leiden University *Sinology*
1997–1998	Renmin University of China, Beijing *Chinese language and culture*
1995–1997	Leipzig University *Sinology (major, Zwischenprüfung), Russian Studies and Economics (minors)*
1992–1995	Kaufmännische Berufsschule Bocholt, Germany *professional training - paralegal*
grants:	
1998	EU Erasmus Scholarship *one-year partial scholarship to study in the Netherlands*
1997	German Academic Exchange Service (DAAD) *one-year full scholarship to study in China*
languages:	German (native), Dutch (certified), Chinese (certified), English (good working skills), Russian (excellent passive skills)
hobbies:	gardening (favourite: geranium), platy fish breeding (favourite: blue wagtail platy), working out (favourites: body pump, body balance)

PORTFOLIO RELATED TO CLIMATE AND ENERGY OR INFRASTRUCTURE GOVERNANCE

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publications:

- **"In the Shadow of Constructed Borderlands: China's One Belt, One Road and European Economic Governance."**
  In *Shadow Economies along the New Silk Roads*, ed. Eva Hung and Tak-Wing Ngo (Amsterdam: Amsterdam University Press, 2020).
- **"Renewables and the Core of the Energy Union: How the Pentalateral Forum Facilitates the Energy Transition in Western Europe."**
  In *The Geopolitics of Renewables*, ed. Daniel Scholten (Cham: Springer, 2018).
- **"Climate Change Negotiations in a Changing Global Energy Landscape: A Wicked Problem."** (co-authored with Ellen Hey)
  ESIL-European Society of International Law Reflections 2, no. 7 (2013), https://esil-sedi.eu/wp-content/uploads/2013/09/ESIL-Reflections-Handke-and-Hey.pdf, pp. 1–6.
- **"A Matter of Cautious Diversification: How China's Energy Cooperation with Central Asia Has Changed the Geo-economics of Eurasia."**
  (co-authored with Thijs Van de Graaf)
  OGEL – Oil, Gas & Energy Law, 3 (2008), https://www.ogel.org/article.asp?key=2762.
- **"Energy as a Bond: Relations with Russia in the European and Dutch Context."**
  (co-authored with Jacques J. de Jong)
  Clingendael Energy Paper, September 2007, https://www.clingendaelenergy.com/inc/upload/files/Energy_as_a_bond.pdf, pp. 1–78.
- **"Securing and Fuelling China's Ascent to Power: The Geopolitics of the Chinese Kazakh Oil Pipeline."**
  Clingendael Energy Paper, August 2006, https://www.clingendaelenergy.com/inc/upload/files/Chinese-Kazakh_Oil_Pipeline.pdf, pp. 1–99.

book reviews:

- Xu Yi-chong, *Sinews of Power: The Politics of the State Grid Corporation of China*. Oxford: Oxford University Press, 2017.
  in *China Information* 32, no. 2 (2018).
- "Book Review Essay: Contextualizing China's Resource-fuelled Rise" on Elizabeth C. Economy and Michael Levi, *By All Means Necessary: How China's Resource Quest Is Changing the World*. Oxford: Oxford University Press, 2014; Stuart Harris, *China's Foreign Policy*. Cambridge: Polity Press, 2014; and Monique Taylor, *The Chinese State, Oil and Energy Security*. New York, Palgrave Macmillan, 2014.
  in *China Information* 29, no. 3 (2015).
- Gianluca Ferraro, *International Regimes in China: Domestic Implementation of the International Fisheries Agreements*. London: Routledge, 2014.
  in *China Information* 28, no. 3 (2014).

academic activities:

2020

- "A legal void between Alashankou and Brest?: The reverberations of the EU's conventional approach to a changing Eurasia."
  International Conference *Checkpoint Politics and the Control of Resource Flows at Chinese Borders*, Centre for Greater China Studies, The Hang Seng University of Hong Kong. (accepted for 12–14 August 2020, event postponed due to coronavirus pandemic)
- "Risk governance as a continuum of risk perception and legality: The regulation of electricity transmission in the EU."
  Society for Risk Analysis-Europe Benelux Conference 2020 *The Risk Technology Nexus and Socially Disruptive Technologies*, Center for Humans and Technology, Eindhoven University of Technology. (accepted for 24 March 2020, event postponed due to coronavirus pandemic)

2019

- "China's informal interference with international institutions in Africa, eastern Europe, and

the Arctic."
Seminar *In the Shadow of the New Silk Road* (co-convened with the Clingendael Institute and the Ministry of Foreign Affairs), The Hague, 19 July 2019.

- "Shadow regimes encroach on the European Union: China's institution-building in the Arctic, Eastern Europe, and Africa."
  Workshop *In the Shadow of the New Silk Road* (co-convened together with Tak-Wing Ngo and Frans-Paul van der Putten) during the 11th International Convention of Asia Scholars (ICAS 11), Leiden, 18 July 2019.
- "The global energy transition and Belt & Road: Interactions in Southeast Asia."
  ICAS 11 – Panel 187, Institutional Panel by the Ministry of Foreign Affairs of the Kingdom of the Netherlands, Leiden, 17 July 2019.
- "Harmonising oversight: How ACER could see to State Grid's investments and shape EU low-carbon power transition."
  Conference on *Harmonisation in Environmental and Energy Law*, Faculty of Law, Hasselt University, Hasselt, Belgium, 28–29 March 2019.
- "How Europe and the Qing Dynasty endured the Little Ice Age: Social resilience, norms, and adaptable governance."
  International Open Workshop, Session 11, *Social Resilience to Climate Changes with Perspectives on the Past 5,000 Years*, Kiel University, March 14–15 2019.
- "The evolution of the CBDR principle in the UN climate regime: Lifting a profound barrier to the global energy transition."
  Workshop *Renewable Energy in the SDGs: Barriers, Opportunities, Interaction*. Faculty of Law, University of Groningen, 28 February 2019.

2018

- "Delineating State Grid's role in the EU low-carbon transition: Rules, standards, and notions of energy justice."
  Diplomacy and Global Affairs (DGA) Research Seminar, Research Group on Diplomacy and Global Affairs, Institute of Security and Global Affairs, Faculty of Governance and Global Affairs, Leiden University, 20 December 2018.

2017

- "From oil interests to multilateral activism: China's role in Africa's security order."
  Diplomacy and Global Affairs (DGA) Research Seminar, Research Group on Diplomacy and Global Affairs, Institute of Security and Global Affairs, Faculty of Governance and Global Affairs, Leiden University, 7 June 2017.
- "In the shadow of constructed borderlands: China's One Belt, One Road and European economic governance."
  Workshop *Shadow Silk Road: Non-state Flow of Commodity, Capital, and People across Asia and Eurasia*, Hang Seng Management College, Hong Kong, 25–26 May 2017.

summer school lecture:

"Dimensions of international climate action: EU climate and energy governance and regional interactions."
UNU-CRIS Summer School *The EU and the UN in Global Governance*, Bruges, Belgium, 18 June 2019.

academic guest lectures:

2018–2019	"EU energy and climate governance" in the course *European Integration*, Master International Relations and Diplomacy, Faculty Governance and Global Affairs, Leiden University
2015–2017	"China's energy diplomacy" in the course *Diplomacy and International Relations in East Asia*, Master International Relations and Diplomacy, Faculty Governance and Global Affairs, Leiden University
2010–2015	"Russia's energy sector" in the course *World History: The Rise of Emerging Economies*, Bachelor History, Erasmus School of History, Culture and Communication, Erasmus University Rotterdam