

## **Waste crime from three criminological perspectives. Implications for crime control and harm prevention.**

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*This paper focuses on the waste-crime nexus. We discuss which implications different criminological approaches to the waste-crime nexus and their respective etiological explanations and views on financial incentives hold for crime control and harm prevention. After all, the criminogenic opportunities of waste as a product and a sector are utilized by corporations as well as criminal organizations. This makes waste crime a topic of research for corporate crime and organized crime scholars. Moreover, waste crime is also a topic of green criminological research. For each of these three perspectives, we discuss what consequences the theories have for controlling and preventing waste crime and whether the contemporary regulation and enforcement answers to these requirements. Besides existing criminological studies on waste crime, this paper builds on the finds of our own studies on the Dutch waste sector and the Belgian trade in e-waste. We also pay attention to how these three criminological perspectives are reflected in reports and recommendations on waste crime by NGOs and international governmental organizations. For each of the three perspectives, we discuss a couple of prominent cases of waste crime that reflect the framing of the nature and the causes of the theoretical perspectives.*

Key words: waste, organised crime, corporate crime, green criminology, environmental regulation

### **Introduction**

A rising world population and increased production and consumption generate ever higher quantities of waste. By 2050, the approximately 9 billion people on the planet will produce an estimated 13.1 billion tonnes of waste per year (Hoornweg and Bhada-Tata, 2012; Zoi Environmental Network and GRID-Arendal, 2012). The use of chemicals in product manufacturing has also contributed to a higher toxicity of waste (Pellow, 2007). From the 1960s, the Global North became increasingly concerned about the potential environmental and health hazards in these higher quantities and toxicities of waste. These concerns led to the creation of many laws and regulations about waste recovery, disposal and transport. Answering to these legal requirements of environmentally sound waste treatment implied a much higher cost. This resulted in the waste industry becoming a sector of high economic importance (Mathews, Ribeiro, and Vega, 2012; Rucevska et al., 2015).<sup>3</sup>

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Waste trade happens for several reasons such as the recovery of secondary materials, the proximity of recycling facilities across borders and the existence of specific treatment facilities in few locations. The search for cheaper ways to treat and/or dispose of waste is however the most important reason behind the trade. The financially most interesting option is often located across borders (European Environment Agency, 2012). Both legal and illegal enterprises are keen to pocket those high profits (Ruggiero and South, 2010). In fact, the transition from legal to illegal can occur at several stages of the waste process such as national and cross-border transport, in collection or disposal (Passas, 1999).

Illegal waste disposal is one of the first topics that was defined as environmental crime (Block and Scarpitti, 1985; Szasz, 1986) and thus became part of 'green criminology' research (South, 1998a, 1998b). Long before the emergence of this sub-discipline, waste crime was studied from other criminological perspectives. The criminogenic opportunities of waste as a product and as a sector are abused by both corporations and criminal organizations, making waste crime the topic of corporate and organized crime research.

Studying a phenomenon within a specific criminological research tradition impacts its framing – and therefore the way in which the phenomenon is defined and characterized. This influences theoretical explanations about the nature and causes of the phenomenon, which in turn impacts the crime prevention or control policy and thus the ways in which police and other security services address it. A clear example of this is the conclusion of the Dutch Organized Crime Monitor that organized crime happens in social networks, which resulted in a crime control strategy of targeting offenders that occupy crucial 'nodes' in these networks (Kleemans and Kruissink, 1999; Kleemans, 2014a). Of course, police work is more often informed by forms of crime that affect and concern citizens most directly and visibly. Organized and corporate crime does not seem to be high on civilians' lists of concerns (Devroe and Ponsaers, 2015). However, we consider it a responsibility of criminologists to translate scientific insights about crime to implications for policy making.

In this chapter, we therefore aim to explicitly connect theory to practice. Our central question is which implications different criminological approaches to the waste-crime nexus and their respective etiological explanations hold for crime control and harm prevention. To answer this question, we build on three criminological perspectives on waste crime: waste as organized crime, waste as corporate crime and waste from a green criminology perspective. For each of these three perspectives, we discuss what consequences the theories – and views on the role of illicit gains of waste crime – have for controlling and preventing waste crime and whether the contemporary regulation and enforcement answers to these requirements.

Besides drawing from existing criminological studies on waste crime, this paper builds on the findings of our own studies on the Dutch waste sector (Huisman 2001; Van Erp and Huisman, 2010; Huisman and van Erp, 2013) and the Belgian trade in e-waste (Bisschop 2015). We also pay attention to how these three criminological perspectives are reflected in reports and recommendations on waste crime by NGOs and international governmental organizations. For each of the three perspectives, we discuss

a couple of prominent cases of waste crime that reflect the framing of the nature and the causes of the theoretical perspectives.<sup>4</sup>

In the following part of this article, we discuss what waste crime is and how waste as a sector and product creates criminogenic opportunities for illicit gain. Next, we discuss the involvement of organized crime groups in waste crime, after which we turn to a review of the role of legitimate companies in waste crime. Then, we analyse waste crime from a green criminological perspective. In the discussion, we discuss how these three perspectives relate to each other and propose an integrated strategy for the prevention and control of waste crime.

## **Waste and crime**

Whenever there is no further purpose for a product or substance, be it in production or consumption, waste is generated. Waste treatment is the process that changes the characteristics of the waste to facilitate its handling, to make recovery of secondary raw materials possible or to reduce the quantity and hazardous nature (Williams et al. 2013). Waste disposal is the final phase which can refer to landfill, incineration and dumping. Waste can refer to a variety of materials such as glass, metal, paper, textiles, plastic or organic material (or a mix thereof). It can also be classified based on sectors of everyday life, such as households, agriculture, mining, energy production, manufacturing and construction. Also illicit activities such as drug production generate waste. When substances create extra risks for harming the environment and human health, such waste may be labelled as toxic or hazardous waste. This brings challenges for ecologically sound treatment, which usually also means extra costs.

Waste crimes refer to the trade, treatment or disposal of waste in ways that breach international or domestic environmental legislation and cause harm or risk to the environment and human health. This can refer to administrative/regulatory violations (e.g. in case of non-compliance with license requirements) as well as breaches of criminal law (e.g. deliberately causing harm). Many cases of non-compliance with waste regulation are, in fact, dealt with by regulatory agencies and might not even come to the attention of police or justice officials. Moreover, many violations of waste regulation do not require specific actions; they are often violations exactly because required actions to adhere to regulatory requirements were not taken (Huisman and van Erp, 2013). Many waste crimes thus equal crimes of omission, albeit often with very conscious inaction. Some waste crimes do require specific actions such as in the dumping of hazardous waste and constitute crimes of commission. Further, illegal trafficking of waste often includes fraudulent activities, such as falsifying loading bills or lab reports.

A number of sector and product specific characteristics help explain the connection between waste and crime. The criminogenic character of waste relates, in part, to the development of the sector and the regulatory framework. Today, the waste sector is heavily regulated, but prior to the 1980s there were hardly any laws about the management of and trade in (hazardous) waste. Around that time, chemical disasters such as Three-Mile Island (1979) and Chernobyl (1986), both of which involved

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<sup>4</sup> We do not claim to assess the causal relationship between the framing and the criminological perspective: were cases analysed from that respective perspective or did the cases result in the framing of this type of waste crime from a specific perspective?

radioactive waste, and the Love Canal case (mid 1970s), where a neighbourhood was built on land formerly used as an industrial chemical dumpsite (see Levine 1982 for details), raised public concern about (hazardous) waste generation and disposal in industrialized nations. Once the waste sector within industrialized nations was more strictly regulated, the export of hazardous waste to countries with lower environmental standards and therefore lower costs for treatment and/or disposal became commonplace. When several disturbing cases of toxic waste exports from industrialized to developing countries were exposed, these hazardous waste exports were criminalized in international law.<sup>5</sup> The increased regulation of the industry made the prices for environmentally sound waste treatment skyrocket. The globalized waste market however continued to provide opportunities for both legal and illegal profits (Pellow 2007). The rapid growth and international character of the sector allowed a diversity of actors to work in the waste industry, with brokers and subcontractors involved at different stages (Szasz 1986). In collection, transport and treatment, multiple smaller companies try to compete with the few big ones (Vander Beken, 2007). Combining that with high profit margins and a small chance of getting caught, this is a breeding ground for cutting corners and exploiting legislative loopholes. This is especially true because regulation and enforcement has not kept pace with this global market space (Tompson and Chainey 2011).

The waste sector is an un-level global playing field, with asymmetries between countries in laws, politics, culture, knowledge and awareness. These asymmetries are criminogenic because they foster the demand for illegal goods or services, are an incentive to participate in illegal markets and hamper the ability of authorities to control (Passas 1999, 402). Whereas many countries have ratified and implemented the international legal framework for (hazardous) waste trade, many others have not, which results in legal and law enforcement asymmetries, and consequently in jurisdiction (s)hopping in search of the most favourable (illegal) agreement or for the space between the laws (Clapp, 2002; Heckenberg, 2010). This goes hand in hand with asymmetries in knowledge and awareness about the dangers of substandard treatment and disposal of (hazardous) waste. Moreover, there are economic asymmetries between regions of the world, which can lead countries to accept financially interesting waste transports into their country despite an absence of facilities for treatment or disposal (Bisschop, 2012). Those harmed by this illegal trade often do not have the economic means nor political power to oppose the polluters (Mohai and Saha, 2007).

We have explained why the waste sector is considered to be crime-facilitative, but also waste as a product is criminogenic (Gobert and Punch 2003). Waste allows for fairly easy disguises by mixing it up with less hazardous waste, mislabelling it or selling it as second-hand commodities (Gibbs, McGarrell, and Axelrod 2010). Recyclable material is for instance used to hide hazardous waste or household waste is mixed with hazardous waste and then dumped. Other fraudulent techniques used are the falsification of customs forms by using non-hazardous waste or product codes to classify hazardous waste. Traders under- or over-invoice to disguise waste shipments. An increasing number of containers, containing hazardous waste, are also abandoned in ports throughout the world (Rucevska

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<sup>5</sup> 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; 1998 Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa; 1989 Lomé IV Convention; 1994 Ban Amendment; Montreal Protocol on Substances that Deplete the Ozone Layer; International Convention for the Prevention of Pollution from Ships (MARPOL); 2001 OECD Decision on Control of Transboundary Movements of Wastes Destined for Recovery Operations, the 2001 Stockholm Convention on Persistent Organic Pollutants, the 1985 Vienna Convention for the Protection of the Ozone Layer, and 1992 Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

et al. 2015). Expensive environmentally sound waste treatment means an inverse incentive structure for waste. In contrast to many other industries, waste treatment companies are paid before they incur any costs for treatment and/or disposal. This makes it very tempting to limit the costs and maximize the profits without regard for regulation (Huisman 2001). This makes waste crime a low risk and high profit phenomenon (Rucevska et al., 2015).

As illustrated above, waste as a global sector and as a product creates ample criminogenic opportunities and incentives for illicit gain. In what follows, we analyse waste crime from three criminological perspectives: organized crime, corporate crime and green criminology. For each perspective, we pay attention to the theories used, take note of a couple of prominent cases and discuss implications for crime prevention and control.

## **Waste and organized crime**

### ***Organized crime theory and waste***

Organized crime is one of those types of crime that does not easily lend itself to a clear definition as illustrated by the multitude of existing definitions in scientific literature and policy documents (Von Lampe 2017). Over the years these definitions have shifted between *who* and *what* notions of organized crime and are now often settling on a combination of the two. The former notion refers to stable partnerships of criminals who systematically engage in crime (organized crime groups), whereas the latter refers to serious criminal activities in more loosely organized structures (Paoli and Van der Beken 2014). Organized crime can involve many types of crime (fraud, embezzlement, money laundering, racketeering, extortion, human trafficking, drug trafficking, etc.) and many types of actors who on their own do not constitute a criminal organization, but do so in interaction (Finckenauer 2005). Organized crime is often defined as complex criminal organizations that aim to control illegal markets - and even branch out to legal markets – and attain control by means of violence and/or corruption. However, it changes with new criminal opportunities arising and its definition thus requires flexibility (Von Lampe 2008). Moreover, differentiating between organized crime and corporate crime is not always easy, because there are many interfaces between the two (Ruggiero, 1996). Organized crime is inextricably intertwined with legal activities and companies and is socially embedded (Kleemans and Van de Bunt, 2008; Van de Bunt, Siegel and Zaitch 2014). In case of bigger corporations, the corporate crime argument is usually quite clear, but much smaller corporate entities might have been created with criminal intentions. In (Dutch) practice, police investigations concerning environmental crime often focus on small, almost marginal, companies (Huisman and van Erp, 2013). When defining waste crime as organized, this refers to perpetrators who systematically commit these offenses and who created their organization or cooperation with that criminal intent. Illicit activities are their primary *raison d'être* and these waste crimes go hand in hand with forgery, tax fraud, money laundering, corruption, extortion, etc.

Definitions and theories concerning organized crime therefore need to be dynamic in order to account for new developments in society (Kleemans 2014b). Recent criminal policy often uses organized crime in combination with serious crime. Also environmental crime cases often involve serious crime and have demonstrated the interconnectedness of organized crime groups with legal actors. Distinctions between these activities and labels are therefore not always clear-cut. and

Although this chapter provides examples of organized crime involvement in waste crimes, it is necessary to keep in mind that different countries have different conceptualizations. Using a fairly narrow definition of organized crime, referring strictly to organized crime groups as Mafia-like organizations, Italy for instance does not report any organized crime group involvement in environmental crime. Germany, using the definition of the *Bundes Kriminal Amt* (BKA) reports 7 cases in 2011 and 8 in 2012 (environmental crime overall, not specific to waste). During those same years, the Netherlands reports 34 and 42 prosecutions of environmental organized crime cases (EnviCrimeNet 2014, 2014:18).<sup>6</sup> “Whereas the term organized crime still has strong evocative power, which undoubtedly explains its political success, the many different criminal actors and activities that have been subsumed under this make it a vague umbrella concept, as a basis for empirical analyses, theory-building or policy-making.” (Paoli and Vander Beken 2014, p.13). These conceptual difficulties render assessments of the scope of organized crime involvement in waste crimes (and other environmental crimes) and cross country comparisons difficult.

### **Cases**

Many official reports conclude that organized crime plays an important role in the illegal trade and dumping of (hazardous) waste (Europol, 2015; IMPEL-TFS, 2012; Interpol, 2009; UNODC, 2012). The connection between waste and organized crime is not new. To the contrary, this has been discussed for decades, especially related to the United States and Italy (Ruggiero, 1996; Szasz, 1986). We discuss these two countries because they can be considered prominent cases. Afterwards, we broaden the scope to other countries.

In the United States of the 1970s and 1980s, organized criminals virtually monopolized the collection and disposal of waste, especially in the states of New Jersey and New York (Block 2002; Szasz 1986). Disguised as legitimate firms (e.g. *USA Waste*; *Waste Management*), organized crime groups dominated the solid waste industry. These criminal waste practices ranged from predatory pricing, over mixing of hazardous and non-hazardous waste, to dumping of toxic waste. A parliamentary inquiry demonstrated the relationships of these waste firms with public officials. Regulators failed to effectively deal with the overcharging by the waste collectors, amounting to double or triple the prices of other major US cities, and they also failed to address the systemic corruption. These organized crime groups even resorted to vandalism, violence and threats towards their customers and potential competitors to establish and uphold their monopoly, including two murders (Jacobs, Friel, and Radick 1992). Similar waste hauling racketeering happened in other US cities such as Boston and Chicago, which were later settled in anti-trust cases (Block 2002). The connection of the waste industry and organized crime in the United States is not merely something of the past. In a 2013 US Federal District Court case, 32 people – member of La Cosa Nostra families - were indicted for crimes in the garbage hauling industry (Department of Justice, 2013; Rashbaum and Goldstein 2013).

Similar to the US, the involvement of organized crime in the Italian waste industry has long been recognized (Massari and Monzini, 2004). An estimated 20,000 tonnes of hazardous waste disappears every year, either dumped at sea or illegally transported and dumped outside of Italy’s borders (Alessio D’Amato et al. 2014). One modus operandi is the invoice switch (*giro bolla*) in which hazardous waste

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<sup>6</sup> It is unclear to what extent these reported cases also answer to the official definition of organized crime that is in use in the Netherlands since the Parliamentary Inquiry of 1996 (Kleemans, 2014a).

goes from the producer to a temporary storage facility which changes the documents from hazardous to non-hazardous without actually treating the waste (Alessio D'Amato and Zoli 2011). The trade in waste is allegedly controlled by 'Ndrangheta, La Cosa Nostra and Camorra, that ship it to Eastern European or West African countries, dumping the waste in construction sites or landfills or selling it as fertilizer (Liddick 2009; Eman 2013; Legambiente, 2014). Italy also has about 5,000 illegal landfill sites, especially in the region of Campania which hardly produces any waste (Senior and Mazza, 2004). Corruption of local authorities helps these illegal organizations to continue their business largely undisturbed (A D'Amato and Zoli 2011; Past, 2013).

A lot of the academic publications and government reports refer to the US and Italy when discussing organized crime involvement in waste crimes. Reports about other countries rarely mention specific cases.

The Interpol Pollution Crime Working Group (Interpol 2009; INTERPOL Pollution Crime Working Group 2009) reported about the illegal import and export of waste, ozone-depleting substances and e-waste, and about the illegal dumping of hazardous waste. They report that the complexity of the waste legislation makes it difficult to clearly delineate legal and illegal activities. Also Europol identified the illegal trade in waste as an important threat for European member states and stresses the importance of proactive approaches because criminal markets and methods are flexible (Europol, 2011, 2015). Both organizations refer to business-like structures and loosely organized involvement of organized criminals, who work together for specific criminal opportunities and then form new groups, rather than hierarchically structured organized crime. Some of these more loosely organized networks do have international connections and try to assume power over legal waste treatment or transport companies.

In the November 2011, *EnviCrimeNet* was created in Europe, under the auspices of Europol. One of Envicrimenet's activities has been an *Intelligence Project on Environmental Crime* focused on intelligence gathering about the involvement, vulnerabilities and threats of organized crime groups in environmental crime. Their first report (EnviCrimeNet 2014) links environmental crimes to money laundering, fraud, forgery, corruption and even terrorism and drug trafficking. It states that the threat and extent of environmental crime is overall underestimated, partially due to a lack of information about the involvement of organized crime groups. As mentioned earlier, the Netherlands prosecuted several organized environmental crime cases in recent years. These concerned illegal collection, (international) trade, storage and dumping of hazardous waste and e-waste (EnviCrimeNet, 2014). Several of the criminal groups were intertwined with legal companies through money laundering, illegal construction and corruption. In a couple of cases there was a connection to drugs and human trafficking. The Southern part of the Netherlands for instance has several cases of dumping of chemical waste resulting from the production of synthetic drugs. Environmental criminals who used to work alone, get together in criminal groups. Another analysis of Dutch waste crime police investigations found no connection to drugs, human or weapons trafficking (Neve 2013). For the illegal export of waste from Belgium to African countries, there is often some degree of organization with the so-called 'waste tourists', evident from their falsified passports and interconnections (Bisschop, 2012).

Organized crime is an area that comes with mythical numbers and attempts to criticize them might be perceived as a way to claim the topic is not important (Calderoni 2014). While the various reports by governmental and non-governmental organizations mainly present the assumption that the waste

industry is vulnerable to organized crime, empirical research and the available cases mainly show waste-crime that is committed by mostly licit companies in the waste industry (see later). Organized crime in the traditional interpretation of Mafia-like stable criminal organizations might not be the primary type of crime involved in the waste business, with the American and Italian cases as the well-known exceptions. Instead, more flexible cooperation focused on the illicit activities, often intertwined with corporate forms of organized crime have taken their place (Carter 1999). The interconnectedness of illegal trade with the legal economy is obvious and often it concerns fraud and tax evasion (serious crime) rather than organized crime in the strict sense of the word. The involvement of organized crime groups is therefore not always apparent.

### ***Implications for crime prevention and control***

Labelling waste crime as organized crime implies that the governance response is one of traditional crime control, policing of illegal markets and trying to eliminate and deter perpetrators. Police organizations, whether working within national borders or cooperating internationally, are challenged in their reporting about organized crime. As discussed above, the differences in definitions of organized crime, make a systematic comparison across countries and regions difficult. This is even more true for environmental crime, because it often receives low-priority on policy agendas. This is especially difficult when there is a suspicion of government authorities being involved in the waste crime, either directly or by facilitating it. A policy analysis in the region of Campania (Italy) has for instance shown that the lack of effective responses to the waste issue goes hand in hand with a failure of democracy (Burgalassi et al. 2010). This refers to a lack of involvement of locals in decision making processes despite these locals being the first to be affected by the waste crisis in the region.

Waste as organized crime implies a high priority for crime control, especially compared to corporate crime (see later). Organized crime is often investigated from a 'follow the money' point of view (Kleemans, 2014a). This can also be relevant for waste crime. Money laundering investigations can be an inspiration. A recent evaluation of financial investigation in Dutch environmental crime cases stressed the potentiality of such an approach (Neve and Van Zanden, this volume). This is currently put in practice in one Belgian police district that assigned environmental crime investigations to (chief) investigators with financial investigation expertise.<sup>7</sup>

Moreover, contemporary crime investigations and strategic analyses increasingly focus on intervening in the logistical processes of organized crime and on removing situational opportunities (Bullock, Clarke, and Tilley, 2010; Spapens, 2011). Considering waste crime as organized provides the possibility to apply these approaches, even though the first practical experience with them has delivered few specific leads for new crime control or prevention strategies (Huisman and van Erp, 2013; Neve, 2013). Script analysis can be useful to identify modus operandi and involved actors (both legal and illegal) (Sahramäki *et al* 2016). However, challenges remain in implementing this in enforcement practice because it also requires policy makers and enforcement agencies to analyse how they might (un)consciously facilitate (undermining) criminal activities (Kolthoff and Khonraad, 2016).

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The involvement of organized criminals in waste crime is not always clear, as has been explained earlier. A partial explanation lies in the limited reporting and investigation of waste trafficking, which results in few to no criminal groups being identified (Eurojust, 2014). Remaining challenges are cross-border cooperation in investigating and prosecuting waste crime (Eurojust, 2014; Spapens and Huisman, 2016). The few cases prosecuted in countries where waste trafficking is discovered often rely on judicial proceedings in countries of origin. This is usually a lengthy process and countries do not always keep each other posted (Bisschop, 2015). The EU's Environmental Crime Directive requires member states to install 'effective, proportionate and discouraging sanctions' for environmental crime. In practice, prosecution rarely occurs and sanctioning even less (Eurojust, 2014). There are several reasons for this. The use of special investigative techniques for waste crimes is impossible in many countries because they are classified as too low to be considered serious crime. Too little high quality information is gathered to result in meaningful intelligence. Witness statements from countries of destination of the waste are often not considered admissible in court. Often the shipper, successfully, claims he did not know about the legislation and criminal intent cannot be proven. An absence of technical expertise is also common. As a consequence, police and justice officials often prosecute for the 'traditional' crimes and not the environmental ones.

## **Waste and corporate crime**

### ***Corporate crime theory and waste***

In their landmark study on crimes committed by America's 70 largest corporations, Clinard and Yeager defined corporate crime as "any act committed by corporations that is punished by the state, regardless of whether it is punished under administrative, civil or criminal law" (Clinard and Yeager 1980, 16). Criminologists disagree on whether the definition should be limited to breaches of criminal law or rather not be limited to law breaking at all. There is also disagreement about whether the corporation itself or corporate managers should be seen as perpetrators, resulting in the development of alternative definitions of corporate crime. Despite these differences, scholars generally agree that corporate crimes are primarily committed for the corporate benefit in contrast to other forms of white-collar crime which benefit the individual. Although the distinction between organized and corporate crime has been criticized, the former is mostly seen as an informal organization of people working together with the sole purpose of committing crimes, while corporate crime involves formal organizations without an organizational goal to commit crimes that commit crimes to achieve these goals (Friedrichs, 2010). While corporate crimes are sometimes portrayed as victimless, or as merely producing economic harm, many types also produce physical harm. According to Friedrichs (2010, 65), corporate contributions to poisoning the environment may well be the most common form of such 'corporate violence'.

As discussed above, waste is the inevitable by-product of production and consumption processes of economies on the rise. Waste problems can be traced back to Ancient Rome, but waste became particularly problematic after the nineteenth century industrialization and for many developing economies it is increasingly cumbersome today (Hoorweg and Bhada-Tata 2012). Hazardous waste dumping has always been harmful, but it only became a *crime* problem when the production, transport and treatment of waste was regulated more strictly.

Corporate waste crime comes in two types: waste production and waste treatment. Crime in waste production occurs when corporations dump types or quantities of waste in breach of the requirements of their license or when they dispose waste in absence of a license. This can concern waste water, air pollution or other (hazardous) waste streams resulting from industrial processes. Case studies show that many of these corporations either knew or should have known the inherent risks in dumping hazardous waste, but still opted for dangerous low cost methods of disposal. Furthermore, they typically resisted changing these practices until forced to do so and actively lobbied against environmental legislation outlawing these practices (Friedrichs 2010, 66).

Besides industries producing waste and getting rid of it in an illegal manner, companies in the collection, transport and processing of waste produced by others can be involved in environmental crimes. As explained above, the waste industry is highly regulated in many industrialized countries because of the potential environmental risks of – especially hazardous – waste processing. The legal obligation to process waste in an environmentally responsible manner created a market for the services of waste hauling and processing companies. In the 1980s, the costs for the legal processing of hazardous waste were approximately 2500 USD per tonne, whereas many developing countries accepted this waste for maybe 3 USD per tonne, making it more cost efficient to ship waste to the Caribbean than shipping it 60 kilometres within state borders (Rosoff, Pontell, and Tillman, 2007, p. 166). In some cases, the profit opportunity, just by collecting waste, seems to be the sole business strategy (Huisman and van Erp, 2013). In corporate crime cases, business activities are often seemingly designed for proper handling of waste, but once the waste is collected – and the money is in the pocket – the temptation of cheap substandard treatment or outright dumping is high. Criminological handbooks on corporate and white collar crimes are not the only ones that consider corporations as the main culprits for waste crimes. Also environmental NGOs such as Greenpeace or the Basel Action Plan often label corporations as waste criminals, for instance related to the illegal disposal of e-waste (Kuper and Hojsik, 2008).

So, while the waste industry was meant to prevent environmental harm, it is seen as vulnerable for corporate and organized crime (Vander Beken 2007). As discussed above, the waste industry in Italy and the United States has been associated with organized crime. In contrast, studies have associated the waste industry in the Netherlands with corporate crime. The 1980s and 1990s witnessed several high profile criminal cases against waste processing companies such as *Tanker Cleaning Rotterdam*. While the Netherlands are not alone in having corporate waste crime cases, it is quite unique that it resulted in parliamentary inquiries and subsequent criminological studies. The parliamentary inquiry charged the research team Fijnaut with investigating the alleged infiltration of the waste sector by organized crime (given the Italian and American examples). Instead, the studies showed that established companies in the waste industry were committing crimes and that several characteristics of the waste industry facilitated environmental crime (van Vugt and Boet 1994; Bruinsma 1996; van den Berg 1995; van den Anker and Hoogenboom 1997). The first characteristic is the previously discussed reversed incentive structure. However, Van Wingerde (2012, 85) claimed this to be largely a thing of the past as waste processing firms nowadays often have long-term contracts with waste producing companies. Second, the waste regulations are complex, fail to regulate the entire market and have trouble keeping up with the dynamic character of it. Third, some firms hold monopoly positions while others control many or all segments of the disposal chain (Vander Beken 2007). Recent mergers and up-scaling have increased this problem. Hence, effective industry monitoring is even

harder to achieve whereas illegal practices are easily covered up. This combination of factors offers ample opportunity to commit violations with impunity (van de Bunt and Huisman, 2007).

### **Cases**

Among the best known cases of corporate pollution is the Love Canal case. Throughout the 1920s, 1930s and 1940s, a canal near Niagara Falls (New York) served as a municipal dumpsite and later as an industrial dumpsite for the Hooker Chemical Company (Levine 1982). About 20,000 tonnes of metal drums filled with highly toxic chemical waste were dumped there. After the closure of the dump-site, near the end of the 1950s, the land was sold for US\$1 to the city who later built a school and residential neighbourhood for over 1000 families on it. For years, residents complained of odours and substances bubbling up near houses or playgrounds, unaware of the toxic waste under their feet. A health study later confirmed the serious health problems residents and school children had been suffering for decades (cancer, birth defects, miscarriages, etc). Eventually hundreds of families were evacuated from the area and about 70 acres of land were fenced off. The company was compelled to pay US\$20 million to former residents (Friedrichs 2010). In the aftermath, the US created the so-called *Superfund* to clean up hazardous waste dumpsites.

A more contemporary illustration is that of the 2006 toxic waste dumping which was connected to *Trafigura* and the ship *Probo Koala* they chartered (van Wingerde 2015). The waste was a residue of a process of upgrading low quality coker naphta to fuel oil by treating it with caustic soda, which was carried out on board the vessel. The coker naphta came from Mexico and was transported over land to the US where it started its journey aboard the *Probo Koala*. Twelve trucks loaded with toxic slop that had resulted from the upgrading process were dumped on 18 locations near the city of Abidjan in Ivory Coast. 108,000 people needed medical attention and 15 people died, although *Trafigura* vehemently denied these figures as well as causality. These toxic slops had previously been sent to a Tunisia refinery *Tankmed* for washing, where the refinery refused further washings after workers complained of terrible smells. *Trafigura* then decided to do the washings on board the *Probo Koala*, resulting in 554 tonnes of hazardous slops. There were several failed attempts to dispose the waste in other countries (Malta, Italy and Gibraltar) (van Wingerde 2015). On route for Estonia to load a gasoline cargo, *Trafigura* asked for a quote from *Amsterdam Port Services (APS)* in the Netherlands to treat the slop. The quote based on *Trafigura's* description of the contents as 'gasoline slops' that resulted from regular operation of the ship was €27 per m<sup>3</sup> but after taking samples and finding out what the slops were actually composed of APS significantly increased the quote (€1000 per m<sup>3</sup>), which *Trafigura* rejected. They attempted to unload the waste in Nigeria but eventually ended up in Ivory Coast despite an absence of suitable treatment facilities in that country. In Ivory Coast, *Compagnie Tommy*, a company that had a license (since one month) but neither the facilities nor the human resources to handle this, was contracted to deal with the 'slops' for €30 per m<sup>3</sup>. After the vessel had offloaded the waste in Ivory Coast, the *Probo Koala* set sail for Estonia, after which it was blocked by Greenpeace and court cases started in Ivory Coast, the United Kingdom, the Netherlands and France. In 2007, *Trafigura* (and its Ivory Coast subsidiary *Puma Energy*) received immunity from criminal prosecution in Ivory Coast following a financial settlement of €152 million but without admitting liability (Greenpeace and Amnesty International 2012; van Wingerde, 2015). In 2009, *Trafigura* reached a settlement in British courts, agreeing to pay approximately 950 GBP to each of the 30,000 claimants. In 2012, after several years of criminal investigations, court proceedings and appeals, *Trafigura* and the Dutch prosecution office reached a settlement of €1 million. This is undoubtedly a case of illegal trade and

dumping of hazardous waste, in a complex construction of several companies (*Trafigura, its subsidiaries* and companies they hired) and countries (Mexico, USA, the Netherlands, Ivory Coast). This has even been called a state-corporate crime given the failure of the Ivory Coast authorities to respond (MacManus 2012). The Probo Koala case illustrates “that legal and economic complexities can make it difficult to effectively enforce and prosecute corporate environmental crime” (van Wingerde 2015: 265).

Another type of industrial waste, albeit a very different one, are discarded end-of-life vessels. Approximately 12,000 vessels become obsolete each year, because they are no longer sea-worthy, because they no longer answer to the requirements (e.g. double hull) set by the *International Maritime Organization* (IMO) or because the economic context makes it more profitable to dismantle the ships for parts and secondary raw materials than to keep it in business (NGO Shipbreaking Platform 2013). The shipbreaking industry reclaims the valuable steel and other metals but also has to deal with toxic substances such as asbestos, lead, mercury, residual oil and polychlorinated biphenyls (PCBs). When handled in unsafe ways by beaching the ships, these toxins affect the health of the workers and leak into the coastal and marine environment (Neşer, Üsalan, Tekoğul, and Stuer-Lauridsen, 2008). By beaching these vessels in developing countries, the shipping industry flouts international regulations on hazardous waste although those regulations long ignored this particular aspect of the waste trade and there are many loopholes to exploit (Rousmaniere and Raj 2007). Most of those vessels change owners in the last years and months of travel and use flags of convenience to arrive at their final destinations (India, Pakistan, Bangladesh), thereby disguising the original owner. Part of the responsibility for these waste crimes thus lies with the shipping industry and original owners of the vessels, who neglected to check where their vessels eventually end up. Shipbreaking by beaching is the result of a complex criminogenic interplay of economic actors (shipping lines, financial institutions, cash buyers, classification companies, shipping yards) and political actors (port states, flag states, tax havens) on national as well as international level (Claeys 2017).

We explained earlier how waste collection and processing in the United States has historic connections to organized crime groups, but the waste management corporations that took their place after the crackdown on organized crime do not have flawless track records either. They “possess extensive histories of chronic violations of environmental law, as well as convictions for antitrust violations such as restraint of trade, price-fixing, and bid-rigging.” (Carter 1999, 24). These same companies have been charged with and sometimes convicted for bribing public officials. In other words, their activities are very similar to those of their mafia-predecessors.

Illegal waste shipments are sometimes classified as shipments of products in an attempt to evade waste regulations. A 2001 case involved the discovery of two leaking containers in the port of Rotterdam with paperwork indicating chemicals (legal trade), not the 300 tonnes of mixed expired hazardous waste (illegal trade) that it actually was (EPA 2006, cited in Rucevska et al. 2015). The origin of these containers was a US storage facility that had illegally stored chemicals, which the US EPA had ordered to the clean-up. The storage company then attempted to trade the chemical waste illegally by sending 29 containers to Nigeria, for dumping purposes. In transit in the port of Rotterdam, customs discovered that the buyer in Nigeria did not exist and started an investigation, discovering the illegal trade.

In a study into the illegal trade in electronic waste between Belgium and Ghana (Bisschop 2012), there was a connection to corporate crime in the waste sector. Several stages of the waste process held potential for illegal trade and dumping. The practices of some refurbishment companies and collectors of e-waste fed into illegal e-waste trade. Scrap metal dealers are intermediaries in the collection of e-waste and facilitate the waste fraud. This is consistent with findings by the Interpol Enigma operation, which resulted in criminal investigations into 40 companies for illegal e-waste trade (Interpol 2013). Some shipping agents also facilitate the smuggling or hinder law enforcement by obscuring the paper trail. With the increasing importance of the online marketplace, there are also companies selling e-waste online (e.g., Craigslist, Marketplace, Kapaza, Alibaba, ScrapMetalForum, Ebay, etc.).

Several illegal waste practices – whether in collection, processing or disposal - are intertwined with legal waste and transport activities, taking advantage of lacking regulation and enforcement. Even some prominent waste companies with ISO certification who advertise sustainable practices are involved in waste fraud (Rucevska et al. 2015). Legal entities sometimes outsource their waste treatment and disposal, later claiming they did not know about the illegal dumping practices or substandard treatment, albeit that the cheap prices offered for treatment could have been cause for suspicion (Bisschop 2015). Overall, this makes clear that waste crime is undoubtedly connected to corporations and therefore a corporate crime.

### ***Implications for crime prevention and control***

Labelling waste crime as corporate crime implies that the governance response is one of regulating legal markets and monitoring compliance (Huisman 2014). Contrary to organized crime, part of the corporate waste crimes are crimes of omission (see above): the environmental regulations require companies to take action to avoid harmful substances pollute the environment. Rule compliance requires the investment of time and money; non-compliance saves time and money. In order to prevent and detect violations, regulatory agencies are required to (pro-)actively enforce these rules. Studies have shown repeatedly that environmental law enforcement knows many practical difficulties (Hawkins, 1984; Hutter, 1997). Even though computerization has facilitated information exchange among regulatory agencies, the interpretation of waste regulations and the systematic monitoring of compliance remain problematic (Kluin 2014).

Since the 1980s, environmental governance in general, and for waste in particular, is partially entrusted to corporations (Huisman, 2001; Van Wingerde, 2012). Self-regulation is often financially interesting for corporations, it helps to protect the company's reputation or it helps to ward off more intrusive regulation or anticipate a future tightening of rules (Bartley 2007; Gunningham, Kagan, and Thornton 2003). Studies have shown that self-regulation can work (de Bree 2011), but it does not necessarily encompass the entire waste market from collection over treatment to disposal. In a situation of self-regulation, governments are often meta-regulators, who check the companies before granting licenses and also check their functioning afterwards, albeit often sporadically. This system is often visualized by means of a pyramid of responsive regulation, persuading companies to compliance when the "slippery slope will inexorably lead to a sticky end" (Braithwaite 2008, 93–94), which means revoking licenses or applying criminal justice in case of serious or repeat violations. However, a recent study of the general deterrent effect of sanctioning in the waste industry in the Netherland showed that it only works for those companies that least need it: only those firms that are already actively

managing compliance are receptive to the normative signals send by punitive sanctions (Van Wingerde 2012). Corporate waste crime thus remains an issue of active and unwavering prevention and control.

## **Waste from a green criminological perspective**

### ***Green criminological theory and waste***

When approaching waste crime from a green criminological perspective, a first concern is the definition of crime. Although it would take us too far out of the scope of this chapter to discuss the details about defining environmental crime and harm, it means that a mere judicial definition of environmental crime is too narrow as much environmentally harmful behaviour escapes the boundaries of national legislation. Therefore, environmental harm should be the core focus, no matter whether it is officially classified as a regulatory infringement (Halsey and White, 1998; South, 1998a). This refers to immediately noticeable or measurable harm, but also harm that only manifests itself after a longer period of time or that is harmful across borders (White, 2011). Victims can refer to people but also animals, plants or ecosystems (Hall 2015). This for instance refers to the effect that pollution – a type of waste – has on the air, water or soil quality, even when this concerns only minimal quantities that cause damage only after prolonged exposure. Studying victimization from a green criminology perspective is therefore not limited to an antropocentric perspective but is ecocentric (White and Heckenberg, 2014).

A second topic of importance are the causes of waste crime. Because green criminology is inspired by critical criminology, the role of the powerful in the emergence of environmental harm is studied and empirical causality is inextricably linked to normative questions about responsibility. A green criminology view on corporate crime implies that corporations are explicitly named as culprits and not merely individuals within those corporations. This refers to companies that collect, treat and produce waste but do not bother much about the rules for environmentally sound waste handling. However, a green criminology is not so much interested in the criminogenic characteristics of corporations that violate environmental laws. Such corporations are viewed as being part of a political-economic system that produces ecological disorganization. Especially the concept of the 'treadmill of production' describes how environmental harms are the direct result of the process of economic production, economic growth and capital accumulation under the capitalist mode of production (Lynch, Long, Barrett and Stretesky, 2013). This also refers to the influence of those same powerful actors on policy making and environmental regulation, which guarantees the continued existence of their polluting practices (Mol, 2013). These same powerful economic actors are also the ones most likely to influence international treaties and policy making and enforcement in developing countries (Michalowski and Kramer 1987). Waste from a green-criminology perspective can also include an analysis of how informal waste collection and recycling is criminalized (Brisman, 2010; Groombridge, 2013). Especially the power imbalance between developing countries and multinational companies – whose gross national revenue regularly exceeds that of developing countries - is relevant. Such a perspective invites to look at the responsibility for environmental crime throughout the entire supply chain. Both the cheap treatment and recycling and the (wasteful) production and product engineering contribute to the illegal trade and dumping of e-waste. Producers for instance actively choose to produce products with shorter life cycles who are virtually impossible to fix in order to guarantee continued sales (planned obsolescence) (Brisman and South, 2013). The responsibility for waste crime and by extension pollution lies also with the consumers, who generate massive amounts of waste. Consumers

often do not realize how much waste (air pollution, waste water, etc.) is generated for each product. Many of those costs are hidden and externalized (White, 2011).

A green criminological perspective implies that harm and crime are approached through an (environmental) justice lens. This pays attention to how the most vulnerable groups in society are disproportionately harmed by environmental crime. For waste crimes this refers to the contrast between rich and poor, developing and industrialized countries and within industrialized countries (Clapp, 2001; Mohai and Saha, 2007; Pellow, 2007). The global South is especially vulnerable due to their often weak regulatory system and government, but also their precarious socio-economic situation, causing them to accept illegal but financially interesting (hazardous) waste shipments, no matter whether they originate in corporate or organized crime constructions. Moreover, the political situation might also be one where environmental concerns are not high on the agenda. As a consequence, waste traders can shop around for the lowest costs for waste disposal and offer officials in poor countries attractive prices or bribes for accepting the (toxic) waste into their lands. Also minorities in industrialized countries (e.g. USA) are disproportionately exposed to environmental harm resulting from waste fraud (McDowell, 2013; Ozymy and Jarrell, 2015; Stretesky and Lynch, 1998). These activities are not necessarily illegal, but definitely harmful (awful but lawful). A green criminological approach thus allows us to pay attention to these differences between the Global North and South, rich and poor, powerful and powerless, with waste generally produced by the former and ending up with the latter.

Within a green criminology perspective, studies about waste crime are also closely related to those about pollution. This refers to pollution caused by the political-economic system – the treadmill of production – which accepts harm as ‘inevitable’ to sustain production and consumption processes (Lynch et al., 2013). This for instance refers to waste and pollution – environmental harm – resulting from activities of the oil and gas industry (Carrington, Donnermeyer, and DeKeseredy, 2014; Jarrell and Ozymy, 2012; Opsal and Connor, 2014; Smandych and Kueneman, 2010). Another topic that is commonly seen as pollution but actually concerns waste are the plastic islands and micro plastics in our oceans (Eriksen et al., 2013). Of course, it is hard to name the culprit for this harm, similar to many other topics on the green criminology radar (e.g. climate change) (White, 2015).

### **Cases**

A green criminology perspective on waste crime considers diverse types of harm affecting flora, fauna and vulnerable groups. A green perspective on waste crime allows for a more radical critique of the political economy in explaining and preventing environmental crime (Ruggiero and South 2013). The following provides a couple of examples.

A first example is that of pollution (or waste production) that arises from oil extraction such as that in the Nigerian Niger Delta. Oil extraction is a lawful activity that can still result in pollution incidents and major environmental harm. For decades, multinational oil companies, through local subsidiaries, have been extracting raw oil from the Niger delta. With 550 oil spills in 2014 alone (Amnesty International 2015), the Niger Delta is faced with chronic environmental and health damage to one of the most bio-diverse wetlands of Africa and to one of the most densely populated areas of Nigeria. Water, air and soil degradation together with light and noise pollution by gas flaring irreparably harmed biodiversity and habitats (Nurse 2016). Local fishing and farming – a source of livelihood for the majority of the

impoverished population – collapsed (Izarali, 2015). andand This case answers to several of the characteristics of corporate waste crimes, but the added relevance of a green perspective lies in the attention for the diversity of harms and the attention for systemic causes. The oil production, pollution and degradation of the environment went hand in hand with a more general disruption of the region through conflict, military violence, human rights abuses and lack of investment in education and health care (Bisschop and Janssens 2016). Understanding the causes of the environmental harm in the Niger Delta requires an examination of the broader political and economic environment that facilitates these harms. About 80 per cent of Nigeria’s state revenue comes from oil and gas extraction and many people work for the oil industry. Even though the Nigerian economy is Africa’s biggest (World Bank 2015), it is ranked very low on the UN’s Human Development Index (UNDP 2015). Oil revenue ends up with political elites and does not benefit all citizens (Ongba 2015). The oil industry is also linked to several human rights violations, aside from the environmental harm. Legal action in Nigeria is difficult because many laws are not publically available and because of the lack of transparency in the legal system (UNEP 2011). In 2009, Shell did make a ‘compassionate’ payment of 15.5 million USD to people in Ogoniland, without admitting liability for the deaths of several local environmental and human rights activists. Several victims, with support of ENGOs, continue to seek redress, but then abroad. A court case by relatives of Ogoni environmental and human rights activists which started in 2002 made it to the US Supreme Court in 2012 where it was dismissed because of a lack of connection to the USA. The same plaintiffs, however, recently started a court case in the Netherlands (de Bruyne, 2017). Friends of the Earth, together with four Nigerian farmers, also sued the Dutch headquarters of Shell, for oil pollution in three villages inflicted by subsidiary Shell Nigeria. In 2015, the Dutch judiciary found the case to be admissible, but the court case about the role of Shell in the oil pollution is still ongoing in appeal<sup>8</sup>. This case illustrates that the causes of environmental harm can be very diverse and are often also of a systemic nature. The capitalist dependence on oil as a resource, extracting the oil at virtually any cost, is fundamentally at odds with the wellbeing of nature (Stretesky et al 2014). This not only rings true in developing countries, but was also demonstrated for the US (Greife and Stretesky, 2013, 165) where state legislation is more likely to be favourable to oil discharges (pollution) when state revenue relies on the oil industry, when more production takes place and when political resistance is low.

An example of waste treatment is the earlier mentioned trafficking of e-waste (Bisschop and Vande Walle, 2013). A lot of e-waste, disguised as second hand products, is shipped to developing countries (West Africa and South East Asia) where a large share is (immediately) dismantled to recuperate secondary raw materials. This dismantling is done by vulnerable groups (e.g. poor, minors, religious minority) and without any means to protect themselves from the toxins<sup>9</sup> which are released when burning the waste (Eidgenössische Materialprüfungs- und Forschungsanstalt (EMPA), 2009; Sepúlveda et al., 2010). E-waste smuggling also causes economic harm because it unfairly competes with the legal waste market and because less secondary raw materials are being recycled. As such, it also undermines environmental policy and law enforcement (Quadri, 2010).

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<sup>8</sup> <https://www.rechtspraak.nl/Organisatie-en-contact/Organisatie/Gerechtshoven/Gerechtshof-Den-Haag/Nieuws/Paginas/Nederlandse-rechter-bevoegd-in-proces-tegen-Shell-over-olielekkages-Nigeria.aspx>

<sup>9</sup> E-waste often contains lead, flame retardants, beryllium, mercury



### ***Implications for crime prevention and control***

A green criminology view on waste crime considers the systemic causes (e.g. politics, economy) and pays attention to harm and inequality which also has implications for its approach to crime prevention and control strategy, which is in line with that of critical criminology. This means that green criminologists focus on exposing and changing the criminogenic nature of political and economic systems as well as on specific offenders or crime opportunities.

A green criminological perspective on crime prevention and control would stress the relevance of the interconnectedness of public and private actors (Hall, 2015). Such a perspective builds on the approach to waste as organized and as corporate crime, as discussed earlier. It adds to that a discussion about possible systemic causes in everyday life. This starts out with the definition of what crime is, which in the case of waste fraud has to be interpreted beyond the legal definition. It also implies that harm is not limited to human victims but also includes the environment. Moreover, in addition to a criminal law or administrative approach, solutions for waste crime are sought earlier on in the entire supply chain (producing less waste, consuming fewer products). This means that solutions are found way beyond the realm of criminal justice. "Action taken outside of the criminal law to address such harms, particularly by way of civil claims, is potentially more effective in achieving redress than the limited punishment-based approach of the criminal law" (Nurse 2016: 148). A green perspective inevitably brings us to a questioning of the capitalist system with its focus on surplus value in disregard for potential environmental consequences (Lynch et al., 2013; Stretesky, Long, and Lynch, 2013). It also means the inclusion of the actual costs of production in the price of product, both in terms of water usage and recycling costs once the product is discarded (White and Heckenberg, 2014). This approach to prevention and control of waste crime is in line with campaigns of several ENGOs (e.g. Greenpeace Guide to Greener Electronics; 350.org). Several companies also invest in internalizing the costs and limiting waste (e.g. fair phone).

The question of best practices in prevention and control is partly answered by looking at efforts by NGOs and other social movements. This includes campaigns to deal with climate change (e.g. 350.org, sing for the climate) or with the harm resulting from oil and gas extraction (keystone XL, fracking) (Bradshaw, 2015; White and Kramer, 2015). Sometimes this leads to action research, sometimes including judicial procedures, to counter polluters (Jarrell and Ozymy, 2010). A green criminology perspective to preventing and controlling waste crime inevitably involves a diverse mix of strategies, critically eyeing the political, social and economic context which shapes environmental crime and its governance. Law enforcement plays a secondary role and even then restorative justice is preferred over retribution.

### **Tackling complex waste crimes**

The above analysis makes clear that waste crime is diverse. It involves corporations who pollute more than their license allows for. It includes sub-standard treatment of waste. Sometimes criminal organizations are involved when they illegally trade or dump waste. They falsify documents and abuse legal commercial structures. Sometimes waste crime also involves governments who fail to (effectively) regulate environmental issues. Finally, also consumers are responsible. Thinking about the control and prevention of waste crime thus requires us to take into account a diversity of potential

perpetrators and responsibilities. It is important to include all links in the waste chain from production until final disposal.

In the inherently global context of the waste industry, waste crime requires agencies to work together across institutional and national boundaries (Spapens and Huisman 2016). Transit of hazardous waste remains most difficult to police (EnviCrimeNet 2014). Traffic police regularly stop trucks and confiscate leaking barrels of battery acid or other chemical substances. However, there is limited judicial follow-up and the authorities often end up paying for disposal. Oftentimes it is simply treated as an administrative offense and therefore not registered in crime statistics (Eurojust, 2014). Licenses and inspections are the responsibility of regulatory agencies whereas trade is regulated by customs. Data exchange between these agencies is a challenge, despite the fact that much of the policy on waste is directed by the EU (Bisschop 2014). This requires a mix of administrative and criminal approaches, which increasingly takes place within nation states but will require considerable effort to achieve on an international level.

The British *Environment Agency* has intensely focused on waste fraud over the last decade and have successfully prosecuted over 30 cases involving companies and their directors (Rucevska et al. 2015). They implemented an intelligence led policing approach to reduce illegal exports of hazardous waste (*Securing Compliant Waste Exports Project*) (Gibbs, McGarrell, and Sullivan 2015). This project was successful in implementing this policing strategy, despite the challenges inherent to policing environmental crime (Biermann and Pattberg 2008). By linking enforcement and regulatory information they guided intelligence and addressed environmental crime on the national level. As this intelligence led policing project evaluation showed, combining regulatory and enforcement data can guide better intelligence gathering and result in successful prosecution (Gibbs, McGarrell, and Sullivan 2015). This was successful on the national level, but application in other countries (with different geographic, political and economic conditions) would require adaptations. Applying this on an international level brings specific challenges that are typical for international cooperation, such as insufficient resources, exchanging information and guarantees for the security of that intelligence or the challenge of cooperating across jurisdictions. The globalization of business practices – in the waste sector and others – makes smart regulation a challenge (Gibbs, McGarrell, and Axelrod 2010). The analysis and governance of waste crime on mere national level clashes with the international character of the waste industry. A better harmonization of waste policy and especially its implementation might result in better insights into who is involved in waste crime and how better to prevent and control it. In addition to that, there are challenges which are typical for environmental crime such as a traditionally more compliance rather than crime control oriented regulatory strategy (Pink 2013; Pink and White, 2015). Another challenge is that nation states are often faced with opposition when they want to regulate business (Rothe 2010).

Given the inherent limitations of dealing with waste crime through retributive justice, a focus on prevention is crucial. A theoretical model that is popular with policy makers in dealing with traditional crimes is the situational crime prevention model (Clarke 1992). Recently, this model was applied to organized crime and corporate crime (Benson and Madensen, 2007; Bullock et al., 2010). Even though this model is successful in dealing with illegal poaching, it has not yet resulted in promising prevention strategies for waste crime (Huisman and van Erp, 2013).

The prevention and control of waste crime holds opportunities for cooperation among different actors (companies, governments, NGOs). There is reason to be hopeful, especially about more community oriented approaches to waste crime, next to the more formalized ones. Slovenia for instance saw an increase in detection of environmental crime in 2009, which can most likely be explained by a national NGO campaign that invited citizens and authorities to report cases of illegal waste dumping (Eman, 2013). A Greenpeace report revealed that the electronics originating from Dutch companies were dumped in Ghana, after which the Dutch Environmental Inspectorate attempted to trace the companies that had disposed of the equipment to sanction them. In this case, the attempts were unsuccessful, but by using Greenpeace's information, the Inspectorate sent a signal that it is willing to cooperate with NGOs and to back up NGO monitoring actions with law enforcement (van Erp and Huisman, 2010). Also fieldwork in Ghana about the (il)legal trade in e-waste (Bisschop 2015) made clear that NGO campaigns can positively influence awareness of both authorities and citizens about the harms resulting from substandard dismantling and burning of electronics.

## Conclusion

Waste can be more cheaply dealt with by illegal enterprises who disregard environmental regulations as well as by legal companies who treat waste they are not licensed for with potential partnerships between the two (Ruggiero and South 2010). The term 'organized crime' for labelling waste crime might indeed be less accurate than the concept 'illegal enterprise', where businesses, authorities and organized criminals interact (Ruggiero and South 2010; Chambliss 1978). Labelling waste crime as either corporate or organized crime has significant crime control and prevention consequences. Corporate crime is mostly dealt with by better regulating and monitoring companies in legitimate markets, whereas organized crime is mostly countered by using criminal law to target entrepreneurs operating in criminal markets. From a policy perspective, organized or corporate makes a whole world of difference. Waste as corporate crime brings with it a range of regulatory options. Waste as organized crime mandates the international police organizations to make it a priority. The challenge is in bridging those two approaches. Waste crime as environmental crime prioritizes the environment no matter who bears responsibility for the harm, whether these are corporations, organized crime groups, governments or consumers. This also explicitly talks about the inequality between the Global North and South, rich and poor, powerful and powerless. This implies that avoiding environmental harm requires structural and cultural changes of mentality and behaviour. The challenge lies in finding a strategy for the prevention and control of waste crimes that incorporates these three perspectives.

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