

Chapter 4 PWN: balancing production and nature

4.1 Introducing PWN (Provinciaal Waterbedrijf Noord-Holland)

PWN is located in a large, new building of red brick, concrete, glass and zinc. According to a cab driver, local people call it ‘the ship’. Steps lead the visitor through a terraced garden into a hall with a marble floor, lined with palm trees in large pots. The reception desk is an open structure with two friendly receptionists, each with her own computer screen. For the visitors, there are blue benches and a small table made of a circular glass plate on one leg, balanced by a red marble cube. Several other visitors arrive, and the receptionists seem to know most of them by name. (description of PWN’s entrance on the 2nd of October).

The preface of PWN’s year report of 2000 starts like this: “Herewith we have the pleasure to offer you the year report of 2000. After many years of discussion, the year 2000 brought clearness for the sector on its place in society. According to the bill of Minister Pronk, the water companies remain in the ownership of the government. This means there will be no liberalization or privatization of the sector, and that societal tasks of the sector prevail: supply of drinking water as a vitally important human need, against cost price, and other societal tasks which are connected with that task such as nature management for PWN.”



PWN building at Velsbroek



PWN's reception hall

Table 4.1: Main figures according to PWN's year report 2000

	2000	1999	unit
Total operating income water supply	360,077	342,252	Dfl. 1000
Net result	6603	1872	Dfl. 1000
Water sales	102,983	102,409	1000 m ³
Customers water	685,025	675,952	
Terrains in maintenance	7202	7114	hectare
Employees	863	900	fte
Average gross salary (monthly, full time)	6959	6488	Dfl.

4.2 How is the term 'sustainability' used at this company?

The term sustainability is not used at PWN. However, the company does value the concept:

R3 : Looking at the documents that we use in our board, I don't think the word sustainability occurs in them. (...) And why is that? I think that (...) it's part of the culture of this organization, to do things for the long term. In that sense, we've always been working in a way that you could call sustainable. (29:33)

Long-term thinking is part of the company culture, and this is equated with sustainability. One of the respondents says this culture has historical roots:

R1 : What has mattered a lot to us for many years is (...) business conduct that pays attention to the environment (...) firstly, because we believe in it. (...) we have our roots in the sixties and seventies, when that kind of concept arose. (...) You could say that it's our inner conviction. (26:1)

Another important reason to value the concept is its relevance to clean water resources:

R1 : We can only ask others not to pollute our resources if we ourselves (...) pay attention to our environmental behaviour as well. In that sense, sustainability is an important concept for this company, in which we invested a lot of attention and time, and also a lot of money. (26:2)

4.3 Themes associated with sustainability at PWN

To answer the research question about perceptions of sustainability, it was analyzed what meanings the respondents attributed to sustainability. As described in Chapter 2, these meanings were sorted into themes. The set of themes presented here characterizes the views of PWN.

4.3.1 Balancing water production and nature

How to combine drinking water production and nature management in the dunes is the most important theme related to sustainable development at PWN. The discussion on this theme started in the late seventies:

R3 : What we did as PWN (...) by the end of the seventies (...) was to try and weave together two parts of the company that had always been contrary to each other. (...) If we could develop one vision (...) for a sustainable drinking water supply and a sustainable nature management. (98:7)

A dialectical process started with negotiations about the needs of both camps:

R3 : But there are always two camps, so I think we are switching continuously (...) the first difficulty is to secure a drinking water supply, and the second issue is to secure nature and (...) Visually, it's like a pendulum. (...) if we used another production method for the drinking water supply (...) that maybe costs a bit more, but we could achieve a relatively high gain on the nature side (...) with nature, you can say, well, if you allowed four or five percent of your area to be used permanently (...) as infiltration areas, then it would be a very secure drinking water supply (...) of very good quality (...) the next thing is that you say, well, within those infiltration areas, let's try to optimize nature. (...) we think it's been very successful. (98:11)

After a while, the two camps made peace:

R4 : Of course, it's a culture that you foster, you know, I mean, the fact that we tolerated [Respondent 3] also says something about PWN and the fact that we radiate so much fellowship now, because that's what we do, naturally...

R3 : Yes, sure, we do. (...)

R4 : And that we are laughing so generously, that shows something. (98:24)

Balancing the needs for drinking water supply and nature management resulted in a secure drinking water supply. This security also belongs under the heading of sustainability:

R2 : For drinking water, the big advantage is that we now have a perfectly managed water store in the dune area, from which we can make drinking water of excellent quality. Which is very sustainable, because we expect it to remain available for many years (23:22)

The organizational aspects of this cooperation are discussed further in the section on strategy.

4.3.2 Life cycle analysis

PWN considers an integrated, quantitative approach, such as an LCA an indispensable instrument for achieving sustainability. With the LCA method, PWN introduced a broad scope to its decision making process:

R1 : To put it in a wider perspective. That's why we did a life cycle analysis in the past, to look at what our priorities should be in general. Like in every life cycle analysis, the outcome was certain energy savings and that we should do something with sustainable energy. (26:20)

The broad scope of the LCA ended with focused advice: energy saving and green energy. The other important impact of PWN was its use of pipe material. This was translated by PWN into the designing of water pipelines for long term use. It is further discussed under the heading 'long-term investments'.

4.3.3 Sustainable energy

To PWN respondents, energy is a crucial theme:

R4 : According to the second law of thermodynamics, the whole universe is returning to chaos. So (...) the final stage is very pessimistic. (...) If you choose a smaller system (...) you can say (...) we have a system with continuous irradiation from the sun. (...) So locally, on earth, the development can be against the second law of thermodynamics, namely, towards a higher order. (98:14)

Therefore, this respondent thinks that solar energy is the only sustainable energy resource:

R4 : The proper condition is that you work with the single energy source that is really radiating in. And that you should use processes that do not influence your other processes negatively. And that means, well, we can use the sun and nothing else. (98:16)

4.3.4 Long-term investments

Long-term thinking has been part of PWN culture for a long time:

R3 : The idea that we should do things for the long term is part of the culture of this organization. (...) So we try to safeguard the quality for the long term. That's what we do with pipeline materials, but also with production systems; to make them as reliable as possible. (29:17)

PWN also sees long-term pipelines as the cheapest solution:

R3 : Sustainability means long term to me. (...) And that means that you invest with the lowest possible societal costs. (98:18)

Water pipelines are generally designed to last for at least 50 years. This norm regarding durable infrastructure may change as a consequence of liberalization, one respondent states. In a private sector like the oil business, decisions about transport are made in different way:

R5 : I've been to Texas, where the oil wells are (...) there were old pipelines lying there and new ones and even newer ones. (...) They were put there without any protection. And if they were rotten somewhere, they just put down a new one. (...) That's not sustainable, of course. But (...) I think those Americans clearly did look at: what is the cheapest solution? To build an expensive pipeline (...) so that it lasts one hundred years; but the well may be dry tomorrow. Or to put down a pipeline and wait and see when it starts to leak. (85:33, 85:34)

For the oil companies, cheap pipelines are the best solution, an approach that no doubt leads to a devastated landscape. To plan ahead for fifty years is possible with reliable resources and a stable market, aspects that make the water market different from the oil market. This strategy may change if water companies have to focus more on short-term goals, such as a yearly profit or a short-term concession.

4.3.5 Future-oriented technology

PWN selects technologies that will function under all circumstances in the future. A new pollutant or a more stringent norm may occur, and the technology should be able to cope:

R2 : The purification technology of today does not satisfy us. (...) That's why we decided to use membrane technology, for example, because we think it is a future-proof solution. With that, you get everything out of the water. (...) If some, I don't know what, new pesticide shows up, we can deal with it. (56:1)

With increasingly strict norms for drinking water and an increasing variety of chemical pollutants in surface water, membrane technology has become an attractive solution.

4.3.6 Raw materials and waste management

Another theme at PWN is the management of raw materials and waste:

R1 : Because we produce drinking water, we also use finite resources and we generate pollution. (...) Therefore, we worked very hard on campaigns to stimulate responsible water use. It caused some discussion at the company, because it also means less income. (...) we also looked (...) for ways to limit the use of raw materials and the emission of waste as much as possible. (26:5)

The theme is applied to product demand and to the production process. An overall LCA showed that the use of material for water pipelines is an important environmental effect of PWN, but the specific LCA studies did not indicate a 'winning' pipeline material:

R5 : We also tried that life cycle analysis method. (...) it turns out that there is no difference between PVC and nodular cast iron: the effect is the same. So that means you don't need to worry about deciding which to use. (85:32)

Therefore, choice of material remains a minor theme at PWN.

4.3.7 Prevent surface water pollution

Clean surface water is a theme that is stressed at PWN:

R2 : If you are producing a product like drinking water, and you have to deal with resources, natural resources, then you have a great interest in a sustainable environment, in the sense of an environment which supplies a resource that you have to purify only slightly. (23:2)

4.3.8 Theme overview

The themes associated with sustainability by the respondents from PWN (Figure 4.1) are the result of a historical process that started long before the term sustainability came into use. PWN has always built long-term infrastructure and still aims for long-term investments. At PWN, this long-term thinking includes an interest in innovative technology.

The prevention of surface water pollution has also been an issue at PWN for many decades. Although PWN is hopeful, it does not expect the pollution to stop soon. A consequence of its appeal to others to stop pollution is that PWN needs to reduce the environmental damage it causes, too. To use less energy and materials and to reuse waste, little debate is necessary: this has direct advantages in efficiency. For other environmental consequences, an LCA is necessary, and this has outcomes that have been difficult to implement: green energy and careful use of material.

Last but not least is the theme of balancing water production and nature. This is an important theme because PWN has the task of managing a large nature area in the dunes in addition to the task of producing drinking water. This balancing effort again requires the use of innovative technology, because this is the only way PWN can produce high water quality without expanding infiltration areas in the dunes.

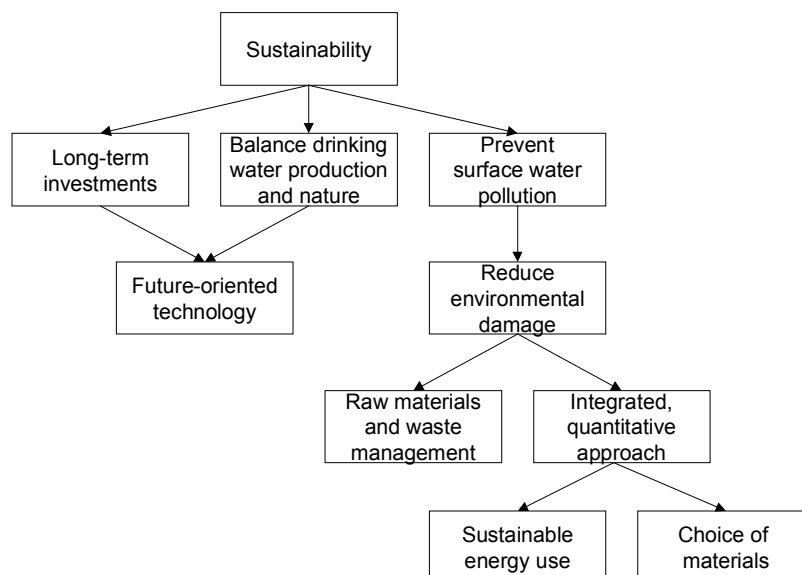


Figure 4.1: Themes associated with sustainability at PWN

The emphasis at PWN is on balancing People and Planet aspects. It has an interest in environmental issues, but balancing production with nature is the most important theme. Because this is also one of the most difficult themes in the field of sustainability, this is an interesting effort.

PWN lacks interest in the economic aspects of sustainability. This has led to a relatively high water price, which does not seem to bother the customers, but is being given more and more attention in the water sector. Only since the benchmark of 1998 has PWN been giving this more attention.

PWN has a somewhat technocratic approach to sustainability: professionals at PWN decide what is sustainable, supported by LCAs where possible. Apart from the discussion of nature management issues, there is little dialogue with other actors on the meaning of sustainability. This lack of contact may cause other actors unpleasant surprises and undermine relationships in the future.

4.4 How does sustainability fit into PWN's strategy?

A salient aspect was that the word 'strategy' was hardly used at PWN. The respondents preferred to use words like 'mission', 'philosophy', and 'goals'. Apparently, PWN still uses governmental language instead of business language. Below, PWN's strategic themes will be explored.

4.4.1 Aim for high water quality and guaranteed supply

At this company, the 'old' drinking water goals are still the first to be mentioned:

I : How would you describe this company?

R2 : A very thorough company, very much oriented towards quality and reliability. (23:15)

In water companies, the term 'quality' usually refers to drinking water quality, and 'reliability' refers to guaranteed supply. Both aspects are related to public health:

R2 : The most important thing is where public health is at stake or the health of people (...) especially of customers. That's our highest priority. (56:9)

PWN is a surface water company, which makes achieving good water quality more difficult:

R3 : Physical - chemical purification is a process in which you continuously add something that you don't want, so you have to get it out again, too (...) many checks and balances need to be built into the whole system; it's very demanding (...) you become very good at it, because you run into these problems every day. (13:35)

The daily quality problems lead to a high level of expertise, and this leads to an interest in innovation:

R3 : I think it was also because of the engineering department. (...) They are all specialists who have their own professional pride. (...) It was fun for them to do it and they really wanted to take part. (29:48)

These engineers get full support from PWN's management:

R3 : The quality-mindedness is a profound characteristic of this company. (...) We never had a top management that said 'It's too expensive', or 'Don't bother!' (...) Sometimes, I even think we went too far, thinking, 'We have invented this now, but can we make it still better?' (29:47)

The respondents described the general PWN culture as innovative:

R1 : PWN has always had a certain culture, an innovative culture in the area of (...) drinking water supply and nature management, and in the area of drinking water technology, too. (84:16)

Next to the innovativeness, there is a risk-avoiding attitude. It developed while PWN was a governmental organization:

I : So, is there a tendency to choose the safest way?

R5 : It certainly has been like that. (...) Especially when, look, the world of civil servants was avoiding all risks. (85:14)

R3 : it's the old dilemma; the better is the enemy of the good. It's been part of these organizations since the beginning. If you don't watch it, it will break you, because it's too much work and it's too expensive as well. (13:42)

This attitude resulted in extremely safe infrastructure designs:

R3 : A nice example is our largest investment project, the new water factory at Heemskerk. (...) At first, it was calculated that it [would] cost (...) more than seven hundred million guilders. (...) So we said, it can't be true that this costs so much money. (...) And then it turned out that the installation was designed with a number of redundancies. (...) If things go wrong, there is something else that can take over. And I believe this was done seven times. Well, then you have an extremely safe design, of course (29:41)

After this discovery, the design was modified. This shows that the cultural norm at PWN is to work on perfection of production and distribution systems.

4.4.2 Innovate organization

The risk-avoiding and hierarchic aspects of PWN's culture developed while it was a governmental organization:

R5 : A lot of people here worked at this company as civil servants. (...) you just had to follow orders. And if you let others know that you did not like the policy, then your head had risen above the average level, and it was cut off. (85:3)

After PWN changed from a provincial department to a public limited company in 1990, PWN management decided to introduce the concept of a 'creative organization':

R3 : One of the first things we did was to try to rebuild the organization to form what is called a creative organization. That is an organization that has a self-learning capacity, which tries to build its whole structure and culture on giving as much responsibility to the people as possible, including those on the shop floor. (13:33)

The company structure was reorganized between 1995 and 1999. PWN reduced 8 districts into three regional units in order to improve efficiency and professionalism:

R5 : Before, there were seven districts and an eighth was planned, PWN had to face its limitations, the information technology among other things, the costs, the vulnerability (...) so that improved the quality. We had more standard procedures; things became more standardized. (85:17)

PWN also uses the EFQM method for quality management:

R3 : We are trying to implement what's called the EFQM method across the whole organization in four years. We started a few years ago. It's reaching deeper and deeper into the organization. (29:37)

From the above, a picture arises of a management that is thoroughly interested in the internal organization. Several concepts from social science and management consultancy have been tested in order to improve cohesion and consistency at PWN.

4.4.3 Aim for low costs

A new reorganization was triggered by the national benchmark:

R5 : It turned out not to be enough, we got the benchmark, so... And in itself, that was correct, because the costs had not gone down. (85:18)

The transport of surface water makes PWN an expensive company:

R5 : We get it from far away and we take it into the dunes; there, we leave it to precipitate. Then we get it out of the dunes, and those dunes are on the other side; it is at a distance from our supply area. (85:83, 85:24)

For surface water, the production costs and the distribution costs are higher than for groundwater. In addition to this, PWN has a relatively large number of employees:

R2 : The companies were compared and it showed (...) that we are relatively expensive compared to other companies, that we have a relatively large number of employees and, based on that, we, as a board, formulated the goal to reduce the number of jobs by 200. So we'll go back to 650 employees. (23:16)

This time, reducing costs is the most important goal. The number of jobs is to be reduced from 860 to 650. This does not mean that money in itself has become a goal for PWN. The respondents connect the low cost aim to quality norms:

R2 : We want to (...) deal with it by looking at all of our working processes very critically, and making sure that we build a company with those 650 employees, with the same or even a higher quality level, and that we run it in a service-oriented way. (23:16)

In order to combine cost reduction with quality improvement, PWN has started a 3-year programme of change. It involves a broad inventory of organizational possibilities:

R2 : During the past six months, we formed (...) a number of vision groups. (...) They went to car factories (...) to Corus (...) they went into the wide world and were inspired by what others do. (...) About one hundred people were involved in that exercise. (23:29, 23:30)

The phase of broad inspiration was about to end at the time of the interviews. After that, the plan was to design new business processes:

R5 : We are starting with a whole new business, to see what it would look like. Then we will compare it to the existing company, to see how we should proceed. (...) I think it's a very useful exercise. (85:18)

To sum, there is no autonomous drive in this company to save costs. Many cultural goals lead to rising costs, for example, risk avoidance, aiming for high water quality, and aiming for guaranteed supply. The benchmark caused a shift in the perception of the managers of PWN, and the company embarked on a reorganization exercise to reduce the number of employees from 850 to 650. The shift in perception has not led to the adoption of a market paradigm within PWN. Money is still not their goal; they link the cost reduction aim to a quality aim.

4.4.4 Protect nature

According to PWN's strategy, drinking water production and nature management are equally important goals:

R2 : It is explicitly stated in our goals: drinking water supply and nature management, together, are our primary tasks. (56:13)

This is not only expressed on paper, but also in the management structure, because the nature department has its own director, with a position in the board equal to that of the director of drinking water production. The protection of nature is a goal at the strategic level for PWN. Dune infiltration results in good product quality, better than traditional chemical purification. For this reason, PWN wants to maintain its activities in the dunes. The consequence of this strategic importance is that PWN actively invests money in nature:

R1 : We are willing to invest significantly in that, and we also want to reduce our activities in the dunes as much as possible. (...) Or maybe even have a positive effect, like with the dune marshes, which we re-created. (26:11)

The long-term synergy between these goals is seen as sustainable management.

4.4.5 Governmental monopoly

PWN positively chooses for its present institutional form, a governmental monopoly:

R2 : We want to stay a public utility company with provincial governments as shareholders (...) monopolies should not be put on the market, because then (...) you can raise tariffs and maximize your profits without any restraint. (...) So the worst thing you can do is to create a private monopoly. It's better to keep the monopoly public. (...) the market mechanism can also be applied on a smaller scale, for example, with a benchmark. The comparison between companies provides enough incentives to become aware of costs and to act efficiently. (56:14)

Therefore, the arguments are that it is a natural monopoly so the real forces of a market model are absent; and that the drive for cost efficiency can be provided by a benchmark. The above quotation explains why PWN pays so much attention to cost efficiency: if it wants to legitimize its preference for a monopoly, it has to act on the outcome of the benchmark.

The governmental monopoly strategy means that PWN does not compete with other water companies. Territorial issues are settled in constructive cooperation:

R2 : Our policy is to restrict ourselves to our own supply area. (...) We have no intention of (...) supplying water outside our area to other companies, unless we are asked to do so. So it will never happen without consulting the company that supplies that area. (...)

We talk about it and then we decide together what the most sensible thing to do is. (56:11)

It is not the aim of PWN to make a profit, for example, by patenting the membrane technology it has developed:

R3 : Is it really our core business to apply for patents? Is it to the advantage of the consumer? Maybe you can lower the drinking water price somewhat. That would be the goal, since we're not allowed to make a profit anyway. (13:40)

These quotations show how the public monopoly philosophy is consistently applied throughout the company.

4.4.6 Aim for larger scale

The managers of PWN are not opposed to a growth strategy:

R1 : NUON is very pro-active in the area of mergers. (...) I admire that because I think it's special if you know how to realize that, and if you dare to realize that in the Netherlands. (84:17)

Merging with other companies to form a multi-utility company would be more logical in a privatized water market:

R2 : So if it is ever decided (...) by Minister Pronk to let go of the governmental ownership, and if our owner says, "Well, here is an amount of money for PWN, I don't need to be the owner anymore", then I am the first to say, "It's OK for me to go and talk to NUON". (56:22)

However, the managers of PWN would prefer to stay within the water sector. PWN would like to merge with other water companies. A merger with neighbouring water companies DZH (Zuid-Holland) and GWA (Amsterdam) is favoured (see also Figure 2.1):

R2 : We have lobbied extensively, also in the direction of the government of Amsterdam (...) because Amsterdam is really very important to us. (...) We own WRK together, we provide each other with water, and our networks are connected. So it would be very logical to intensify the cooperation. (56:12)

WRK is a company located on the Rhine, which pre-purifies water before it is transported to the dunes used by GWA and PWN for infiltration. A month after this interview took place, the municipality of Amsterdam decided to keep its own water company, to the disappointment of PWN.

4.4.7 Water chain

PWN sees cooperation in the water chain as a fundamental element of Dutch water policy. The fact that water has become an important topic of debate pleases them. Up scaling to a water chain organization is viewed as a goal for the distant future:

R1 : At a point on the distant horizon, we see the establishment of an integrated company for drinking water and waste water treatment. (...) We don't want to move in that direction yet, because it focuses too much on the question of structure, on power

relations. And we think it is vital for the coming years to focus on the debate, what we want to achieve with that power. (84:6)

This strategy fits into the general picture in the Netherlands: everybody is in favour of integrated water chain companies, but organizational and financial structures are barriers to their realization. This institutional struggle is interesting for our research, because it is directly related to sustainability themes like those of a whole system approach and renewable resources.

4.4.8 Second opinion on foreign markets

PWN's strategy concerning the foreign market is also of interest:

R1 : I think that, although we missed the opportunity to undertake large projects in the past 50 years, (...) we can become a niche player now, because we are very independent and we have no direct interests (...) in advising governments and companies (...) about how they can avoid the pitfalls of the big commercial interests. (84:9)

This would look like a commercial approach if it did not contain the sentence 'how they can avoid the pitfalls of the big commercial interests'. Again this seems to stem from a governmental policy paradigm.

4.4.9 Strategy overview

In Figure 4.2, the elements of PWN's strategy are shown. PWN's strategy seems to have an internal and an external focus, which are connected only by the low-cost strategy. The internal strategy consists of the old goals 'high water quality', 'guaranteed supply', and 'protect nature'. The balancing of these three goals absorbed most of the management's attention in the past.

The first element of the external strategy is the decision to promote continuation of the governmental monopoly. This decision is followed consistently in all other aspects of the strategy. PWN wants to merge with other companies within the water sector (and later within the water chain). Its foreign role is to assist the governments of other countries in their negotiations with commercial water companies.

Because a debate has started about liberalization, PWN feels it should provide a better legitimization for the monopoly structure. With a low-cost strategy, it wants to prove that governmental monopolists can be cost efficient. It still has to find a way to balance the low-cost goal with the other three goals. The sustainability themes nature management and green energy are the first issues to be affected by the low cost strategy.

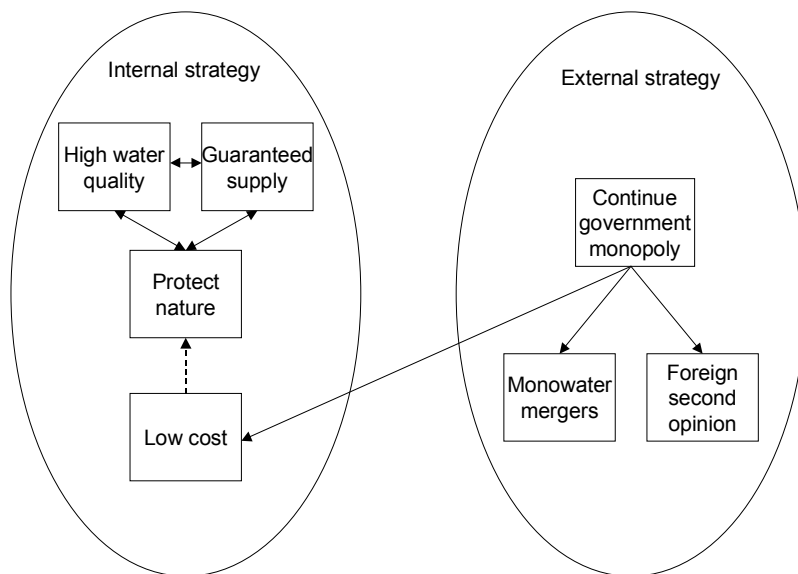


Figure 4.2: Overview of PWN's strategy

4.5 To what kind of 'sustainable practices' does this lead?

4.5.1 Sustainable water supply

The oldest theme for PWN is that of sustainability of water supply. PWN provides drinking water in an area in which most of the groundwater is brackish. It has had to work hard to keep up with the growing demand:

R2 : We started with just the extraction of groundwater from the dunes. That was the only available groundwater around here (...) at a certain point, it became too much and we started with (...) artificial infiltration of water from the Rhine. (...) Then we had to make a choice, because that was not enough either. We decided to purify surface water directly. So we built the unit in Andijk. We had to consider our options every time: (...) how do we proceed, how can we keep up with the growth of demand? (56:29)

Nowadays, PWN uses mainly surface water. About 50% of this is chemically pre-purified and infiltrated in the dunes, 25% is entirely chemically purified, 18% comes from the membrane factory, and 7% is natural groundwater, of which 2% is in the dunes and 5% in an inland pumping station (het Gooi).

For the future, PWN has decided to use membrane technology. A much more sustainable solution is the use of unpolluted surface water. This was recognized by PWN and other Dutch water companies long ago, and for the past 50 years, they have been actively lobbying within RIWA (see also section 3.7). Their goal is to return to the use of clean surface water, which can be turned into drinking water without much purification:

R2 : In the sense that the environment provides a resource that hardly needs any purification. Well, we are not even near that point, although it has been improving (...) We can state that the Rhine is in a much better condition than it was 25 years ago. (23:2)

Although PWN believes that the use of unpolluted surface water is the most sustainable solution, it chooses for membrane technology, which can deal with any kind of pollutant. Apparently, it estimates that it will at least take one generation of equipment before the surface water will be clean.

4.5.2 Balancing water production and nature

Balancing nature and drinking water production is an important issue at PWN at the operational level. Its roots are in the nineteen seventies, when water companies wanted to expand production capacity in the dunes:

R3 : But these areas were crowded with that kind of production facility already. (...) So pressure groups were established. They said, '(...) couldn't we invent some new technologies?' (29:29)

Around 1978, PWN hired a biologist to deal with the societal pressures:

R3 : At that time we were used as a kind of alibi-biologist, that's the kind of word which was used then. (13:1)

With the biologist, the production-nature controversy became relevant at the company:

R3 : I said, well, if there are such expansion plans in our company, then I want a debate about whether it should be done in the traditional way. (...) That caused a lot of resistance in this company; we cannot deny that either. Especially from the designers and the technicians, because it was remote from them. (29:29, 29:30)

A new manager for drinking water production solved the controversy around 1988:

R3 : When [R1] entered the company, that was great for me, because at first he became the director of drinking water supply (...) then I raised the matter again, about the amount of groundwater extraction in the dunes, and that it should be different, and he agreed completely. And that was it. And the next day, it worked. (13:5)

A few years later, PWN's general director changed the company structure to facilitate cooperation between water production and nature management:

R1 : We made a deliberate decision in 1990 to establish a division for nature management and recreation. (...) The intention was to bring a balance into it, after so many years of domination of the division for drinking water production over nature management and recreation. And to make it a structural thing, also in the board and in the status of nature management and recreation. (...) It has a very important influence (...) it ensures that all kinds of decisions (...) are not one-sided, but are made after a proper weighing of both interests (...) I feel that it was a very good decision of my predecessor to organize it that way. (84:23)

The structure worked out well because, at the top management level, negotiations are based on equality and trust:

R1 : By the way, we work on the basis of consent in our board, (...) that's not consensus, but it means that decisions can only be made after all members of the board have said, "I give my consent". (...) Suppose [R2] comes forward with a proposal for drinking water production, which he wants to push through, and I agree with him, but if [R3] says, "I

don't give my consent", then it's over. We agreed on that. And we cherish that as holy (...) if you have an agreement and you break your promise just once, then the trust is gone. (84:25)

This example is followed at lower levels in the company:

R1 : Often, we need to do very little on that issue as directors, because people know there might be a vote in the board (...) in which proposals are rejected if they have not been properly discussed with their colleagues in nature management (...) people say, "Well, that does us no credit, we want to deal with it ourselves, so we'll make sure that we discuss it properly." (84:24)

The balanced approach has advantages for all parties:

R4 : I think the strength of PWN is that we did not make a stand immediately, and then I'm talking about the past ten years, before that it was different. But we said, "(...) let's not start by making a green or a blue stand, let us find out what the issues are and to what extent we can unite them". (...) And as soon as we did that, we had a revolution, we really did (...) we were pleasantly surprised about the extent to which we could operate together without (...) very painful decisions. (...) I think we can be proud of that. I think it makes us different from the others. (98:13)

During the negotiations between the nature management and water production divisions, many synergies were discovered:

R3 : It turns out that, for a sustainable groundwater management, (...) it is convenient to have as much groundwater as possible. And that happens to be (...) one of the basic conditions for good nature management. (98:17)

Who pays for these nature management activities?

R3 : Drinking water supply paid for it. (...) It costs (...) between six and ten million guilders and we do everything for that amount, which is only 2% of our turnover, so the costs for nature are marginal. And the message is not marginal at all, it even dominates in the present time frame, the nature and the recreation function in these areas. (13:49)

It seems that the internal negotiation between the water production and nature management divisions has led to a higher water price:

I : If I may ask a mean question, does it imply that you always agree internally, and that the citizens (...) need to pay five cents more every time?

R1 : No. (...) firstly, the nature management (...) costs relatively little. If we subtract those large investments for the moment. (...) But it's also in their own interests, because they realized (...) that if these steps were not taken, sooner or later, the whole drinking water supply would have had to leave the dunes, which would have led to significantly higher investments. (84:26)

From this answer, we deduce that the process does indeed lead to a higher price for citizens, but that the costs would even be higher if PWN had to leave the dunes altogether. By 'large investments', he probably means the membrane factory. Lately, the costs for nature have attracted some criticism:

R4 : I think it would be honest to say that the way we deal with the conflicting interests is becoming controversial lately. In the past (...) things were more straightforward for the

director of nature management. (...) And to be honest, some people are saying, "Shouldn't we be more critical, doesn't it cost too much?" (98:12)

In addition to the innovative, perfectionist culture and the employment of a relatively large number of people, investing in nature rises costs.

4.5.3 Reduction of groundwater extraction

Balancing drinking water production and nature management had several important operational consequences. In the dunes, the extraction of natural groundwater was reduced from 25 million to 2 million m³ per year. According to hydrological calculations, 2 million cubic metres is a sustainable yield for the long term. PWN reduced extractions without being forced by the provincial government to do so, and at the time, it was an unusual step in the water sector, too:

R4 : We initiated the reduction of groundwater extractions by ourselves, in a period in which such a step was not at all common for a water company. (...) And other water companies were not amused. (...) They thought that, as a water company, you should strive for maximal groundwater extraction. (...) groundwater is, of course, the most ideal resource for drinking water. (25:13)

The natural groundwater that is still extracted has to do with keeping the dunes available as an emergency resource.

R2 : We have a reserve for about five months or so in the dunes, under the dunes, in case the surface water flow is somehow interrupted. Then, we can continue pumping water from the dunes for five months before we really are in trouble. (23:22)

Basic maintenance of this infrastructure requires that a limited amount of groundwater be extracted:

R3 : All kinds of studies have been done to determine how much it can be or should be, because you need to keep the pumps going, you need to keep the filters going, too, because otherwise they won't work after a while. (13:17)

PWN was less pro-active in 'het Gooi', an area in the middle of the Netherlands. The province had to force it to reduce groundwater extractions there. Groundwater extraction was not the only cause of desiccation in that area, so PWN did not see reduced extraction as a solution:

R4 : In 'het Gooi', for example, we were forced by the government to reduce groundwater extractions. We showed there that our (...) groundwater extractions had less influence than, for example, (...) keeping a certain polder dry. (...) But to fill up a polder again, that's much more difficult for those institutions. (...) And so the reduction was imposed on us, and nothing happens in that polder. (25:14)

Apparently, the attitude of PWN towards desiccation problems depends on local circumstances.

4.5.4 Nature-friendly management of infiltration areas

In the infiltration areas, PWN introduced a more nature-friendly management. Fifty percent of PWN's production capacity is still in the dunes, where pre-purified surface water is infiltrated. At first, infiltration areas had an unnatural character:

R3 : They were really sterile places for nature, simple straight canals (...) and the banks were full of stinging nettles. (...) at a certain point, all those wells had to be renewed, because after a while, they got blocked with sand. (...) As managers of the terrain, we then asked, couldn't we increase its value by (...) changing the depths of the canals [and by] creating meandering banks, so that the biotope becomes much more diverse (...) It cost about three million extra, and it developed wonderfully. (...) we got more bird species. (13:14)

In addition to creating better biotopes in the infiltration areas, abandoned extraction areas are restored to their natural states:

R3 : We try to take out the things that do not belong in such a natural system. We try to get subsidies for this, but if that does not succeed, well, then we save money for it ourselves; that's also an ongoing program. (13:19)

From the above, we can conclude that the balancing of nature management and drinking water production is fully implemented.

4.5.5 Dealing with drainage problems

The reduction of groundwater extraction in the dunes causes drainage problems in nearby municipalities. In the northern part of PWN's region, problems are solved smoothly:

R3 : Above the North Sea Canal, we already went through that process a few years ago (...) there everyone is convinced, all those municipalities (...) that it's a shared problem and that it is not caused by PWN, but that it has something to do with the drainage systems and so on. The water boards are much more involved, and I think that's why they see us more as partners. (13:56)

In the southern part of the dunes, PWN's policy was introduced only a few years ago. The reduction of groundwater extractions coincided with flooded basements in neighbouring towns:

R2 : The consequence is that municipalities are protesting and citizens are protesting and they are saying, 'Our basements are getting wet and we have drainage problems and PWN, you have to pay, you are the cause'. But all we did was to stop using our right to extract water, and we did this because it fitted into the national policy of preventing desiccation. (...) We could have been at zero already, but now we are forced to extract about five million cubic metres per year, simply to give the municipalities some time to deal with the drainage problems. (23:3)

Therefore, although PWN wants to stop groundwater extractions, it still extracts five million cubic metres because of drainage problems. For these extractions, PWN has to pay groundwater tax, though it does not produce drinking water with it:

R2 : We don't use that water for drinking water production and still we have to pay those 30 cents of groundwater tax. So that's really weird. (23:5)

This sounds like a deal no commercial company would agree to. Why does PWN accept it?

R2 : We could say, 'We don't care and we're going to stop those pumps just like that, and you guys just solve it, municipalities and province.' But that's not how it works. Look, we are owned by the provincial government, we have close relationships with politics, too. We need the municipalities in other ways, of course, also for the management of those dune areas. (...) and as for the customers (...) you can't say, as a public utility company, 'After us, the deluge', literally and figuratively. So we think we have a moral obligation to do something about it. (23:5)

This quotation shows that PWN still identifies with governments. The citizens use municipal governments to defend their interests and focus on PWN as the main cause of all the problems. PWN has a different view: the houses are built in the wrong places, leaking sewerage systems have been renewed and so do not have a draining function anymore, and the most important cause is the heavy rainfall of the past few years.

An independent researcher was hired by the Provincial government to sort the problem out. He concluded that 'If there is 40 cm of water in the basement, 5 cm, at the most, is caused by stopping the extractions' (Volkskrant, 5 May 2001). Based on the outcome of this research, solutions will be discussed with municipal and provincial governments and water boards:

R2 : In the end, a solution has to be found which enables us to stop pumping. And there (...) has to be enough drainage (...) to keep the inhabited areas dry enough. And at the same time, it has to enable the realization of water retention in the dunes.

I : Yes, so a couple of technical solutions need to be found?

R2 : Technical solutions need to be found. Yes, yes. (23:8)

PWN defines the problem primarily as a scientific and technical problem. It seems to have difficulty in discussing it in a diplomatic way and relies for a large part on the provincial government to defend PWN's decisions. It is experienced by the citizens as hiding and makes them more angry. On the other hand, we notice a strategic unwillingness of the citizens to accept a complex set of causes for their problems. If PWN is the only cause, it is much simpler to decide who should pay. This attitude has possibly developed because PWN is perceived as a rich company.

4.5.6 Innovative technology

A consequence of balancing nature management and water production was the building of a new production capacity outside the dunes:

R1 : It would have been much cheaper for us to expand those infiltration ponds and to infiltrate more. But that would mean a larger occupation of something that does not belong in the dunes originally. We decided not to do that, but to build a costly factory with completely new technology outside the dunes. (26:9)

Therefore, PWN built a new installation for water purification at Heemskerk, based on membrane filtration technology, which had never been applied at that scale before. The factory took over 18% of PWN's production capacity. PWN plans to introduce the technology in its conventional chemical purification plant in Andijk as well. This is a decision that leads to rising costs.

4.5.7 Green energy

The use of surface water involves a large energy input compared to groundwater. For the membrane technology factory, this input is even greater:

R4 : We chose for membrane filtration. We know that it uses more energy; we even commissioned a life cycle analysis (...) if you draw the boundaries correctly, and this does not happen in the benchmark, you know. The benchmark only compares what we take from the electric point, but if you remove calcium chemically, it is taken from the electric point of the chemicals supplier, and if you use membrane filtration, you take it from of your own electric point. (...) If you do the LCA properly (...) the score is the same. (...) if you replace the electricity by green energy, then you are suddenly top of the bill, as far as the environment is concerned. (98:34)

Switching from groundwater to membrane technology made PWN look bad in the Vewin benchmark, because use of energy was given more weight than desiccation or biodiversity:

R3 : I really thought it was a bit hard on us, but also on other companies (...) as surface water companies, we are always the most expensive where energy is concerned. (...) I think it is not balanced (...)

I : And your efforts to protect nature were not measured?

R3 : That was not part of it, no. (13:20)

The simplest solution is to switch to green energy. PWN was already aiming for this in 1995, before the benchmark was made, but it turned out to be difficult:

R3 : Our opinion is (...) that, because of the way we want to deal with natural resources, we need to show it in that respect too. But it costs several millions more per year. (29:24)

R4 : That means it was raised in our Board of Directors. I don't want to name anyone, but within that Board, there was not much support for it. (98:33)

Therefore, the Board of Directors, in other words, the Province of Noord-Holland, more or less stopped PWN's plans to buy green energy around 1995. Another barrier to implementation was the cooperation with two other water companies, DZH and GWA:

R4 : The second difficulty was (...) that we chose at a certain moment (...) to buy our energy collectively. (...) That meant that green energy also needed to be discussed as part of the cooperation, and there were clear differences within the group. (...) So that also weakened the decision-making process. (98:33)

Eventually, the three water companies decided to buy ten or fifteen percent green energy.

It seemed that PWN was on the road towards using green energy, but then the cost issue interfered. At the political level, water tariffs became more important when the liberalization discussions started around 1995. The benchmark of 1999 drew extra attention to the cost issue, but also the energy issue. PWN was classified as one of the most expensive water companies in the Netherlands, and as one of the worst environmental performers. This possibly this made the issue of green energy more urgent for PWN. After reading this chapter in 2003, a respondent informed me that PWN's use of sustainable energy was now 75%, and it planned to build windmills to provide the remaining 25%.

4.5.8 Water chain cooperation

PWN investigated the possibilities of water chain cooperation as soon as the discussion came up:

R1 : During the past few years, we explored what we want to do with the water chain. Do we want to achieve complete integration of drinking water and waste water, as the extreme on the one hand, or are we going to do nothing at all, as the extreme on the other hand? Well, in between those extremes, all kinds of possibilities were explored. (84:2)

PWN tried to implement the 'financial water track', which means that all water expenses and taxes are combined on one bill, and are dependent on the amount of drinking water a customer has used. This turned out to be impossible under the current legislation:

R1 : We put a lot of effort into it, together with a number of water boards (...) and we succeeded only partly, because this pilot law was adopted which made the financial water track possible under a lot of conditions, which in fact removed the core, the essence from the whole idea. And now, well, we are trying (...) to realize a compromise version for a few municipalities anyway. (84:2)

Other water chain options are even more difficult, so PWN has now put the water chain low on its list of priorities:

R1 : For now, our (...) conclusion is that the merger to cover the water chain can be a goal on the horizon, but it's not our primary goal right now. (...) We have the feeling that we would start at the wrong end of the debate (...) because then we would end up in a power struggle. (...) if you talk about climate change, if you talk about the role water can play in the Netherlands, then you are talking about something other than power and which organizations are going to do it. (84:3)

This shows that the water chain is seen as a strategic issue by the respondents from PWN, but they are no longer putting much effort into it. They are waiting for the results of the national debate on water management, again showing a governmental way of looking at this development.

4.5.9 Household water

In PWN's situation, the development of household water would possibly save some energy. The respondents from PWN consider this gain irrelevant:

R4 : If a family wants to do something for the environment, then I would say, 'Please, don't ask for a second supply system, but do something else, buy an energy efficient car. Then you contribute ten times more than when you ask for a second supply system.' (25:5)

R4 : For one family, the energy used by producing drinking water is only 50 kilowatt hours (...). The whole energy use of a family is 60,000 kilowatt hours. (...) So if we are talking about societal efforts, then it's foolish. (98:30, 98:31)

Therefore, PWN is not developing any household water projects.

4.5.10 Overview of sustainable activities

We conclude this section with an overview of the things being done by PWN to achieve sustainability and the things it is not doing (Table 4.2). It shows that PWN focuses on the prevention of desiccation and on nature management. Other options have been explored but were considered irrelevant in PWN's situation.

Table 4.2: Overview of the sustainable activities of PWN

Code	Example quotation	Outcome
reduce waste & emissions	'All our drinking water sludges were removed by the waste reuse organization.' (23:25) 'We achieved many successes as RIWA (...) So the Rhine has become much cleaner in many ways.' (26:32)	PWN solves problems with waste and emissions in cooperation with other water companies.
save energy	'When you leave, I will turn off the lights. But otherwise, there is not much to be done to save energy.' (85:27)	Saving energy does not have a high priority.
green energy	'We intend to buy between 15 and 20% of the energy from green energy producers.' (13:24)	PWN aims to buy green energy but external forces limit the possibilities (in 2000)
choose materials	'We also looked at the LCA methodology. (...) it turns out that there is no difference between PVC and nodular cast iron' (85:32)	Choosing different materials is considered irrelevant because of the LCA outcome
protect nature	'We invested hundreds of millions of guilders in nature management during the past ten years (...) how can we achieve an optimal situation for both interests?' (84:24)	PWN invests large amounts of money in nature management
prevent desiccation	'The use of natural dune water was reduced from 25 million cubic metres to 2 million cubic metres.' (26:31)	To prevent desiccation, PWN reduced groundwater extraction to the minimum amount needed to keep the installations operational for emergency situations.
reallocate water production	'It would have been much cheaper to expand those infiltration ponds. (...) We decided not to do that, but to build an expensive facility with completely new technology outside the dunes.' (26:9)	Fifty percent of PWN's drinking water comes from infiltration, 25% from physical/chemical purification, 18% from membrane technology, and 7% from groundwater extractions. Extra capacity will be realized outside dunes.
promote water saving	'We carried out a lot of campaigns to promote responsible water use.' (26:5)	PWN promotes water saving by households.
develop household water	'If you do an LCA for household water, the result is that the environmental effect is negative.' (98:28)	PWN does not develop household water.
use surface water	'We reduced groundwater extraction voluntarily'. (25:13) 'We are almost entirely a surface water company.' (26:38)	PWN switched to surface water as its main resource.
protect groundwater	'That is still the reason why we don't allow motor vehicles on our terrains.' (13:15)	PWN enforces strict rules in its water production areas to prevent groundwater pollution.

4.6 PWN's network

For PWN, four external respondents were interviewed: one from the Province of Noord-Holland (PROV), two from two different nature organizations (NAT1 and NAT2), and one

from colleague company DZH (DZH). In the following sections, we present the views of PWN on external network partners as well as the external views on PWN.

4.6.1 The Province of Noord-Holland

Looking at the influences on PWN's strategy, the Province of Noord-Holland clearly emerges as the most important actor:

PROV : I think the provincial government has an essential influence, the largest influence, actually. Because it is, in fact, steering PWN through the Board of Directors. (87:38)

PWN was started as a regional water company by the provincial government in 1920. In 1934, the provincial government also delegated the management of nature and recreational facilities in the dunes to PWN. Until 1990, PWN was part of the provincial government. In 1990 it became a public limited company, with the provincial government owning 100% of the shares. The managers of PWN consider themselves fortunate in their 100% shareholder:

R2 : As far as PWN is concerned, it has been an advantage for us that there was only one shareholder with a clear vision of the company. Aiming at sustainability, at the long term, and not at short-term issues. (29:60)

The provincial government would prefer a merger between PWN and GWA, the two water companies in the Province of Noord-Holland. GWA is the company operating in Amsterdam, and so far, the municipality of Amsterdam has resisted the provincial pressure. The provincial government demanded that it at least cooperate, to make investments in production capacity more efficient:

PROV : Until '94/'95, the relations between PWN and GWA were really bad. That was blocking cooperation. One of the demands we put in the Reorganisation Plan (...) was that they should operate (...) as if they were one company, as far as investments were concerned. (...) in practice, it worked out very well. Within six months, the companies had reached an agreement, and they started to make arrangements to share each other's water supplies for the next 25 years, and large investments became unnecessary. (87:11)

Although the provincial government has a great influence on PWN, PWN does not feel dominated. It creates strategic freedom by doing exactly what the province wants and more:

R1 : As long as they feel (...) that we are following the outlines of their policy (...) then we always found that we got a lot of latitude from the provincial government. (...) if we work against that flow, they will say, 'Listen, we are going to limit your freedom, because you are heading in a direction that we don't want'. (84:12)

Trust is an important characteristic of the relationship between PWN and the provincial government:

R3 : I think it makes a difference (...) if they feel that they can trust us. (...) A situation like the one we had yesterday (...) when there was a calamity, and they have the feeling, 'Those guys are picking it up well, everything is put aside to solve the problems'. (29:53)

Recently, the provincial government decided to reduce its influence on PWN by inviting more external members to join the Board of Directors:

R1 : After the latest provincial elections, it was agreed (...) that the Board of Directors had to become smaller and that the number of provincial representatives had to be reduced (...) at this moment, we have three people from the provincial government left. (...) And we have four people who (...) bring in a certain level of expertise from the outside world. (84:21)

As was explained before, PWN developed a 3-year plan for the reduction of the number of employees from 860 to 650 people. The new Board of Directors thought this was too slow but the PWN management convinced them to choose a careful approach:

R2 : We had intensive discussions about it in the Board of Directors, yes. Some of them even said, "Well, if this was the conclusion drawn for companies like Philips or Ahold, then they could never take their time until 2002." We managed to convince them that, in our sector, that if we did it faster, we would lose a lot. (23:18)

The new Board is somewhat more critical, but PWN is still allowed to develop its own solutions.

Conclusion regarding influences on strategy: the provincial government is the most influential actor for PWN, for which the 100% shareholdership of the province is an important cause. A close relationship exists between the provincial government and PWN, based on trust and frequent dialogue. A change in Board of Directors, resulting in it having more members from outside the provincial government, did not alter the cooperative relationship.

Now, let's take a look at how the respondent from the provincial government talks about PWN. He uses the term sustainability, but not in his contacts with PWN:

PROV : I think that when the Water Management Plan was issued, especially the last one of 1998, the discussions with the water companies were already behind us, so we never sat around the table again to ask 'Do your activities conform to all these sustainability aspects?' (87:21)

The ideas behind sustainability were dealt with before the term became popular, and now there is no reason to introduce it to the discussion. The term sustainability is especially useful for the provincial government at the start of a strategic discussion:

PROV : If we were to start the discussion with the water companies now, we would look at "What is our framework, what policy do we want." Then we'd end up with terms like that and then we'd put them to the test. (87:22)

For the respondent from the provincial government, sustainability means working within natural systems, using renewable resources and staying within the carrying capacity of the water systems:

PROV : One of the principles of sustainability is that you use the natural forces of the system as much as possible. And that you don't use finite resources or create irreversible situations. And that you use the carrying capacity of the water system. (87:23)

Conclusion regarding influences on perceptions of sustainability: Like PWN, the provincial government does not consider use of the term sustainability necessary in discussions about PWN's activities. The themes associated with sustainability at the provincial government are

working with natural systems instead of against them, using renewable resources including sustainable energy, and not exceeding the carrying capacity of the water systems. These themes are important to PWN as well.

The link between water production and nature management was introduced to PWN when the provincial government delegated management of the dune nature reserve to PWN in 1934. The provincial government owns the land, and PWN maintains it on the basis of a fifty-year maintenance contract. Every ten years, the contract is renewed to take account of the latest views of nature management.

R1 : For PWN, it was (...) important to also have a management task in the nature area. And an important task is (...) recreation facilities in Noord-Holland and that the provincial government can ensure (...) that it happens the way it wants it to happen, because it owns 100% of the shares. (26:24)

In addition to this, the provincial government can influence PWN with groundwater extraction licenses. The licensing policy is based on the provincial Groundwater plan, which became effective in the middle of the nineteen eighties. Versions of the plan were disputed, but the final version was accepted:

PROV : The greatest controversies were when we were working on the Groundwater Plan, and now I'm talking about the eighties, about the amount by which groundwater extraction had to be reduced to restore nature. (...) There was massive resistance from the companies. But when the Groundwater Plan was confirmed by the democratic procedures of the province, it was accepted rather quickly. (87:3)

PWN complied with the plan of the provincial government:

R1 : At a certain point (...) we said, "Well, if this is the direction that our owner, the governor of this province, has chosen, then let's not resist that. But (...) let's give it an extra impulse." So we (...) made an enormous leap ahead that went even further than what the provincial government was asking of us at that time. (84:11)

PWN was rewarded by the provincial government with support for its innovative solutions:

R3 : Because we needed them to cover us, of course. All those new technologies cost a lot more money. (29:27)

Conclusion regarding influences on operations: the provincial government has an important influence on PWN. Its decision to delegate the management of the dunes to PWN made nature an important goal in the company. In addition to that, the provincial government limited the use of natural groundwater, and stopped PWN from using green energy. In an effort to be ahead of these pressures, PWN went further than mere compliance. This may be a result of the custom in the drinking water sector to think far ahead.

4.6.2 Nature organizations

At PWN, the influence of nature organizations is seen as positive:

R1 : So Nature Monuments, the Foundation for Dune Conservation, is very important to us (...) it has always followed us critically and it has had a very clear influence. We don't mind that, you know, we think it's good. (26:21)

One of the strategies of nature organizations is to influence the governments who have power over water companies. The respondent from DZH, the colleague water company, describes it as follows:

DZH : Our director sometimes says, jokingly, that the Province (...) of Zuid-Holland has a boss, and he's called the 'Foundation for Dune Conservation'. (65:1)

The provincial governments involve nature organizations more and more in advisory committees, to the point where it becomes a burden for the nature organizations:

NAT1 : In the past, we had to keep harping on before we were allowed to make a comment. Nowadays, (...) we're simply expected to comment on everything. And we (...) take part in every consultation structure. We are talking ourselves to death at the moment. (69:62)

It is likely that this lobbying of the provincial government by nature organizations takes place in Noord-Holland as well. The respondent from a nature organization wants to keep the governmental structure intact and is against the liberalization of water companies:

NAT1 : We do not want private, commercial companies to become responsible for the maintenance of nature areas. (...) then we'd be back in the old situation of the estate owners, of the private owners. (...) it would become a strictly commercial balancing of costs and returns. (...) at this moment, water companies are public utilities. So you can constantly account for the fact that they serve a common cause, and that they may have costs, which are for the common good. (69:40)

The view of the nature organizations possibly supports PWN in insisting on its public monopoly status.

Conclusion regarding influences on strategy: Nature organizations have an important influence on PWN, both through direct contacts and through coalition with provincial governments.

The respondents from the two nature organizations do not use the term:

NAT2 : It's not the usual terminology at Nature Monuments. But I think it is very much our... when we're working on sufficient space for natural processes in nature (...) and the environmental conditions in those areas, that it really is sustainability that we are working on. But I can't say we actually use that term a lot. (...) We do use it though, when we try to influence governmental policy. (86:11)

The respondent from the other nature organization does not see the relation between nature and sustainability. To him, sustainability is a concept that applies to humanity and not to nature:

NAT1 : I think the concept of sustainability has something to do with human activities; it does not apply to nature. (...) People often have a time horizon of a few years. (...) Nature has a time horizon of millions of years. And across that time, nature moves, it changes. (69:21)

However, when this nature organization formulates a vision of how water production fits into the Dutch dunes, it does use the term sustainability:

NAT1 : we also want to reduce surface water infiltration significantly. (...) we want to replace it with other technologies, such as membrane filtration or deep infiltration. That's

how we elaborate the concept of sustainability as it is mentioned in those national policies. (69:56)

This organization develops a view of nature management that is in itself independent of sustainability. When its vision is presented to the outside world, the concept of sustainability is introduced, because this is a meaningful governmental goal.

One of the nature organization respondents also mentions energy use as a theme:

NAT1 : The most recent membrane technologies use less energy than the old methods. But it remains a problem where sustainability is concerned. (69:52)

Conclusion regarding influences on perceptions of sustainability: Nature organizations and PWN make similar use of the term sustainability. They think their activities deserve the label 'sustainable', but do not find it necessary to use the term internally. They use the term mostly when communicating with provincial governments. At nature organizations, we found the themes of reserving space for nature to develop, minimizing human influences on nature, and saving energy.

In the beginning, the discussion between the nature organizations and the water companies was purely adversarial:

NAT1 : Between 1977 and 1985, there was a quite heated debate between the water companies and the nature conservation organizations.

I : Very confrontational, I suppose?

NAT1 : Very confrontational. (69:4)

The nature organization soon added a discussion about technological alternatives to its strategy. It saw that it had to speak the drinking water company's language to come to an agreement:

NAT1 : Right from the beginning, we (...) started to organise discussion meetings on the subject of alternatives for the water extractions that were used at the time. (69:2)

Around 1978, a PWN respondent initiated contact with Leiden University. This led to fruitful interaction:

R3 : One of the first things I did (...) was to arrange a meeting with [name], he was the biggest adversary of the water companies at that time, and I made an agreement with him, "The louder you yell, the more I hear". (...) We managed to develop a policy (...) [in] interaction with those kinds of groups. (...) I think that's why we were able to take such a big step in this company. (13:2)

Nowadays, the nature organizations and PWN agree on what needs to be done in the dunes:

NAT2 : The developments we see in the Kennemer Dunes at this moment, I think it's wonderful. Because they stopped the groundwater extractions, as far as I know. (...) and now we can discuss natural processes, and the future of the whole area. (86:19)

PWN and the nature organizations cooperate in a political lobby:

NAT2 : PWN is actually a kind of nature-managing organization, like we are. We both have an interest in good provincial nature policy, for example, (...) so that's a political lobby. (86:30)

Conclusion regarding influences on operations: about 15 years ago, PWN was forced to take the nature organization seriously, because the provincial government adopted its nature goals. Because of the professional and constructive approach of the nature organization and of PWN, relations improved, and nowadays PWN, the provincial government, and the nature organization can be considered as one actor-coalition. They cooperate to realize nature-management goals at the strategic as well as the operational level.

4.6.3 Vewin and colleague companies

PWN appears to be an important supporter of the Vewin organization:

- I : I'm hearing different opinions on Vewin. Many people think it has no value at all.
R1 : Yes, that's absolute nonsense. (...) I sometimes hear such rumours as well, and I totally disagree. (...) Vewin continuously did a good job at a high level. (...) Vewin held a mirror in front of us all the time, and if you don't like that mirror, there is a strong tendency to say that Vewin is worthless. (84:35)

This is one reason for PWN to act seriously upon the Vewin benchmark: to prove that cooperative action works:

- R1 : We realize that the political trend is going in another direction, the breaking down of monopolies, and so we wanted to examine our methods; so we let our umbrella association, Vewin, do a benchmark. (26:27)

PWN prefers cooperation within the drinking water sector to a commercial approach. For example, it decided not to obtain the patent rights for its membrane technology:

- R3 : Our consideration was that if we did not apply for a patent (...) we could ask for compensation (...) so we asked other water companies "Are you interested, then you're welcome, but then we do expect you to contribute your knowledge (...) and to think as hard as we do, and then you can also profit from the knowledge that we build up together. (13:39)

Conclusion about strategic influence: the fact that PWN feels obliged to act upon the outcome of the Vewin benchmark shows that Vewin and colleague companies have an influence on PWN. PWN values the cooperation between the Dutch water companies highly and prefers this to a competitive attitude. Therefore, PWN is an important carrier of the Vewin organization. This means that there is a mutual influence.

At DZH, one of the neighbouring water companies PWN wants to merge with, the term sustainability is used too freely, its respondent says. At DZH, the term means using the dunes for water production in such a way that this will remain possible for a long time:

- DZH : The dunes are quite central in that process, so we want to organize the process in such a way (...) that it can function like that for a long time. So we don't exhaust the dune area. (65:6)

The condition of the dunes should not deteriorate because of heavily polluted infiltration water. Secondly, the condition of nature in the dunes must stay in an acceptable condition, because otherwise societal actors may remove the water company from the dunes altogether:

DZH : In 1970, (...) water extraction in the dunes was (...) a very damaging activity, and a lot of governmental policies were aiming to remove water production from the dunes altogether. (...) I think our image is different now. The provincial governments say, “Well, the dune area is closed in by cities on all sides, which is an enormous spatial pressure. Will nature last alone? If the water company (...) developed an awareness of nature and the environment (...) and if it managed those dunes properly, then it would actually be quite a good solution for the area.”

I : Would it improve the dunes?

DZH : No, of course not. The dunes can take care of themselves perfectly well. Hundreds of thousands of hectares exist where no man ever sets foot, and they look better than these dunes. (...) But within this metropolitan area, this very crowded area (...) I think it is a very acceptable compromise. (65:11)

This last citation reveals the company’s motivation to become involved in nature management. These arguments play a role in PWN’s strategy as well.

For the respondent from DZH, sustainability also means saving energy, and clean river water. For this company, it is the river Meuse instead of the Rhine.

Conclusion about influence on perceptions of sustainability: at DZH, the term is used more often than at PWN. The important themes at DZH are long-term management of dunes, saving energy, and clean rivers. They are comparable to the themes at PWN, although DZH seems to be somewhat more concerned with human interests.

In the data, we found no indication of an operational influence of DZH on PWN. This influence may be mainly the other way around, because nature organizations use PWN as a positive example towards other water companies:

NAT2: If PWN can do it, then I think that this should be possible at other companies, too. (86:24)

And other water companies consider PWN to be ahead of them in nature and environmental management:

DZH : I think that nature management achieved a greater importance at PWN than at DZH. (...) On the other hand, we were a little earlier than PWN (...) to put two goals into our regulations, water production and nature management. So I think we are (...) comparable and, well, we compete with each other in a way. (...) we always think that they are braggarts at PWN. (65:14)

Conclusion regarding influences on operations: PWN cooperates with other water companies to develop strategy as well as technology. These companies have little influence on operational issues concerning sustainability, because PWN is ahead of the rest on most issues. Sustainable energy is an exception.

4.6.4 Ministry of the Environment

The Ministry of the Environment has an influence on the water supply sector in several ways. Firstly, the Ministry’s Inspectorate of Public Health controls drinking water quality. The Inspectorate has direct operational influence on the company when water quality is threatened:

R1 : Yesterday evening, the Inspectorate told us, “We think you should get the message across to every household that your water in ‘het Gooi’ is polluted with bacteria”. (84:29)

When there is a water quality problem, the Inspectorate has a direct influence on operational affairs. In the calamity described above, the Inspectorate forced PWN to send letters to 30,000 households within 24 hours. Next to the Inspectorate, the Ministry of the Environment is responsible for drinking water legislation. PWN keeps regular contact with the Ministry to follow and influence the development of new law:

R1 : If they ask for people, like, “Can you send some people to participate in a working group?”, we always say yes immediately, because that’s the way to find out what the Ministry is thinking and also to make it aware of what we are thinking. (84:13)

The Ministry of the Environment’s decision not to privatize the water sector is supported by PWN:

R1 : We wanted to show with this interview that we supported the policy he was developing. (84:14)

Thirdly, the Ministry supports merger plans of provincial governments:

PROV : The minister was of the opinion that the number of 100,000 connections should be the lower limit of the scale of the companies. That gave the provincial governments something to hold on to. (87:14)

Conclusion regarding influences on strategy: the Ministry of VROM has a large influence on PWN through legislation. PWN stays in close contact with the Ministry to make sure its ideas are heard. PWN has a cooperative attitude towards the Inspectorate.

In cooperation with the Ministry of the Environment, the Ministry of Finance introduced a groundwater tax in 1994 that made a switch from groundwater to surface water more attractive for PWN:

R2 : The state (...) imposes a groundwater tax of 30 to 35 cents per cubic metre (...) because, it says, “We want to use that as a measure to reduce groundwater extractions and to make it more attractive to switch to surface water”. (...) That tax made it attractive for us to switch to surface water, and to close the pumping station down. (23:5)

The Ministry also supported the implementation of innovative technology:

R3 : If it was about long-term policies of open infiltration or deep infiltration, and using less dune water, or even no dune water at all, they always stimulated us to think in those directions. (29:52)

Conclusion regarding influences on perceptions of sustainability and operations: PWN was stimulated by the Ministry of Environment to switch to surface water as much as possible.

4.6.5 European Union, the Ministry of EZ, and the energy sector

The European Union favours a market structure for public utilities over governmental monopolies. In the eyes of PWN, water should be an exception:

R1 : In the whole European Union, and actually the rest of the world, there is a tendency to allow permeation of more and more market elements in all sectors of society. And to accept monopolies less and less. (...) Drinking water is such a monopoly, though a natural monopoly, because it's hardly possible to make a purely commercial company out of it. (...) so we would like to stay a government-controlled monopoly. (26:26)

There are actors in favour of liberalization within the Netherlands: large industries and the Ministry of Economic Affairs:

R5 : An association of manufacturers (...) told the minister that its competitive position was poor, because the infrastructure was so expensive, and that it should become cheaper. Then the minister started an investigation. (...)

I : And 'the minister' is from Economic Affairs?

R5 : Yes, Economic Affairs (...) Out of the investigation (...) came the conclusion that a lot could be privatised, prisons, public transport, public utilities. (85:20)

Another pro-liberalization actor is Nuon, one of PWN's colleagues:

R2 : It is working very hard on it, it really tries hard to draw the water business within its corporation. (...) the market for energy will be liberalized, which means that Nuon cannot be sure that all the small users will continue to buy its energy. If they buy water from Nuon, it will be a larger step to buy energy from a different company. (...) So Nuon thinks it's a strategic advantage to hold on to its customers. (23:13)

Conclusion regarding influences: all of these actors put PWN under pressure to behave in a more market-oriented way. PWN interprets this mainly as better cost efficiency, and refrains from most other aspects of commercial behaviour.

4.6.6 Consumers and large customers

PWN has several relationships with consumers, not only through the supply of drinking water, but also because of its nature and recreation management. Consumers support PWN's nature management and want PWN to improve its service:

R1 : What we are experiencing is that our captive customers are different today from what they were ten or twenty years ago. (...) they want information and they don't want to be put off with promises. (...) But they also tell us, "(...) we think it's very important that you do the nature management well. (...) and we are also willing to pay for it. And we want you to offer us a certain type of service for the drinking water supply." (84:33)

Large customers were traditionally given little attention:

R5 : One problem was that the large business customer got lost in between the normal customers. And he was given the same answer, even though he actually deserved more attention. (85:37)

Since about 1995, this has improved, because PWN installed an account manager especially for the large business customers. This does not mean that small customers are being given less attention. One of the respondents thinks that providing a small customer with a distribution pipeline is equally important as providing a big customer with one:

R5 : It does not matter to me if it's someone with a summer cottage at the other end of the bush (...) last week, I was working at a meat processing plant; it needed 60 cubic

metres per hour. So that's a lot of water. (...) I calculate that, too, it does not matter. For me, they are all of the same importance. (85:35)

Conclusion regarding influences on strategy: PWN considers consumers important, and consults them about investments in nature and improvement of service. PWN improved the service to large customers, but does not consider large customers more important than small customers.

The support of consumers for PWN's investments in nature is based more on the recreational value of the dunes than on the value of nature in itself:

R3 : It is still difficult for me to get the utilitarian label off the Noord-Holland Dune Reserve, if I look at it from a gloomy angle. (...) We have about eighty entrances, so everybody has the feeling, "I'm walking into my back garden." (...) They value it highly, but they do not feel that it's a very special nature reserve. (29:31)

PWN also communicates with consumers through information centres in the dunes. In these centres, it presents exhibitions about nature and about drinking water production ("Drinking water from your tap seems so simple, but it is not!", exhibition of Summer, 2002).

There is also the debate about drainage problems. The consumers appreciate PWN's nature management activities in the dunes, but they want their drainage problems to be solved:

We pertinently disagree with the position of the provincial government, that there is no relation between the groundwater inconvenience in Heemstede and the stopping of the water extractions in the dunes. (...) Ecological maintenance of the dunes is perfectly alright with the citizens of Heemstede (they'll just put on their boots for the winter stroll that PWN has organized for Sunday), but we do not accept this leading to inconvenience and damage in our living areas.

(Speech of the political party 'Citizens' Interests in Heemstede' in the municipal council on 8 February 2001, <http://www.heemsteedsburgerbelang.nl>)

According to a respondent from another water company, the crisis shows that PWN has not approached the consumers in an effective way. Another point of debate with the consumers is household water. Consumers see it as an environmental improvement, but PWN does not:

I : Who exactly is asking for this second supply system?

R4 : Many consumers, because they think, 'We are flushing our toilets all the time with that excellent water'. (...) and they suspect that if the water is less purified (...) it will lead to some saving. But it implies a second supply system and a lot of energy and material is invested in those pipelines. And the energy you save is only small. (25:6)

Conclusion regarding influences on perceptions of sustainability: PWN and the consumers have different ideas about sustainability issues. PWN reacts to this by explaining its view but not by adapting its view: PWN is the professional.

4.6.7 Water boards

PWN aims at close cooperation with water boards. The implementation of a collective billing system in the water chain was investigated and this will lead to some pilot projects:

R1 : We work closely with the water board. (...) we explored if we could implement the so-called 'financial water track'. (...) We put a lot of effort into it, together with a number of water boards (...) and in the end, we succeeded only partly. (84:2)

Because of the fundamental discussions about water management in the Netherlands, and because of up scaling activities both by water companies and water boards, this cooperation will not lead to mergers between PWN and water boards in the near future.

Conclusion regarding influences: PWN cooperates with water boards but this cooperation is developing slowly and the water boards probably have no influence on sustainability issues.

4.6.8 Municipalities

The respondents from PWN and the external partners agree that municipalities are relatively unimportant:

PROV : I think the provincial government has a significant influence. (...) Next to that, I think the national government (...) is influencing PWN. Who else... (quiet). Well, municipalities, that's nothing really. (87:38)

According to the managers of PWN, they are lucky to have no municipal shareholders:

R3 : At this point of time, local politicians are mostly judged on their financial performance, and the idea slowly emerged in society that public utilities are worth a lot of money. (...) if a politician only has 5 or 10% of the shares of such a company, and can never really decide on the policy, unless he goes to a lot of trouble to lobby for the support of fellow-shareholders, he'll decide to (...) just take out the money, because the rest is already being dealt with by others. So he will be (...) much less involved than when you have only one shareholder. (29:12)

Therefore, municipal shareholders are more inclined to tip the balance towards the liberalization of water companies, because their influence on water companies is small anyway.

In the drainage controversy, the municipalities defend unsatisfied citizens. PWN is forced to continue extracting groundwater until the municipalities and the water boards find a technical solution.

Conclusion regarding influences: municipalities have little influence on PWN's strategy, but they do influence PWN's operational activities.

4.6.9 Overview of network influences

In Table 4.3, an overview of network influences is shown. Many actors have some kind of influence on PWN. Often, this influence is welcomed or invited by PWN. PWN strives to cooperate with the first four actors in Table 4.3, and they have very similar ideas on sustainability.

The provincial government is the most powerful actor and its ideas overlap almost completely with PWN's ideas on strategy as well as sustainability. This is not strange because, only 12 years ago, PWN was a governmental department, and the provincial government still holds 100% of the shares. The strategy of balancing water production and nature management is a direct consequence of the provincial decision to trust PWN with the management of nature in the dunes.

The concept of sustainability itself is not important in discussions between PWN and its network partners. These discussions concentrate on how nature should be taken care of. The whole 'actor-coalition' agrees that PWN will come a long way in meeting the sustainability criteria if nature is taken care of in an acceptable way; and this may be true.

The energy theme was mentioned by all network partners, but the making of decisions in that respect is more complicated. PWN respondents agree at the abstract level that energy should be saved, and energy should be green. On the other hand, they argue that energy use should be weighed against effects on nature. This refers to membrane technology, which costs extra energy while it frees the dunes of water production activities. The fact that green energy is more expensive makes PWN and the provincial government hesitant.

Table 4.3: Influences of the network on PWN

	Influence on strategy		Ideas about sustainability		Influence on sustainability activities	
Province of Noord-Holland	large influence on strategy, close contact, PWN has a more than cooperative attitude	++	similar low use of term, similar themes	+	crucial impact on all operational decisions	++
Nature organizations	influence through cooperation and through coalition with province	++	similar low use of term, similar themes	+	operational cooperation	+
Vewin and similar companies	PWN stimulates cooperation, PWN is influenced by the Vewin benchmark	+	similar reasoning concerning management of nature in dunes combined with water production	+	PWN most innovative, except for green energy**)	-
Ministry of the Environment	powerful, PWN has cooperative attitude	++	- *)		groundwater tax changed view of surface water use	+
Ministry of Economic Affairs + EU	force PWN to react to cost debate	++	- *)		cost issue made sustainable energy and investments in nature more difficult	+
Consumers	are consulted on price, nature management, and service	+	- *)		partly diverging ideas, little influence	-
Large customers	no influence	-	- *)		no influence	-
Municipalities	no shares, no influence	-	- *)		drainage debate: PWN forced to continue extractions	+
Water boards	cooperation is developing slowly	-	- *)		not yet	-

*) = no data

***) in 2003, PWN made up arrears: 75% is now green energy and it plans to produce the remaining 25% using windmills of its own.

Although PWN's strategy is to resist the liberalization ideas of the Ministry of Economic Affairs and the EU, this coalition does influence PWN by forcing cost reduction on it.

Actors with little or no influence are customers, water boards, and municipalities. This may be a result of PWN's strong relationship with the provincial government; the provincial government represents this group of actors in the eyes of PWN.

4.7 Case-specific Conclusions

There is general agreement in the Netherlands that PWN is the greenest water company. The word 'sustainability' is rarely heard in this company, but the perceived meaning of sustainability is valued and the managers of PWN insist that it's exactly what they are striving for. The most important theme related to sustainability is the balancing of drinking water production with nature management. They also see a life cycle approach as relevant, and as a consequence of that, energy use is an important issue. Furthermore, long-term investments in infrastructure and future-oriented technology are identified as ways to contribute to sustainability.

Sustainability ideas combine well with most of PWN's strategy. This strategy is based on a positive decision to remain a governmental monopoly, with high water quality, guaranteed supply, and protection of nature as its main goals. The tactical goals are the protection of water resources, long-term investments in infrastructure, and the development of innovative technology.

Most of the ideas on sustainability are fully implemented in the company. The company structure is based on balancing nature management and water production interests, because both are represented equally in the management team. Membrane technology is operational, dune infiltration areas have been rebuilt in a nature-friendly way, and the extraction of natural groundwater has been reduced to a low level.

In the year 2000, the company still wrestled with the green energy theme. PWN wanted to achieve high water quality without exploitation of nature. This meant that it had to use surface water, which costs more money, and it had to use membrane technology, which uses extra energy. PWN could buy green energy, but it also wanted to reduce costs. This was not because it intended to become commercial, but because it wanted to legitimize its governmental monopoly by showing that it could be cost-efficient, too. Therefore, taking on extra costs for green energy was not convenient at that point. After reading this chapter in 2003, however, a respondent informed me that PWN's use of sustainable energy is now 75%, and it plans to build windmills to produce the remaining 25%.

The use of the term 'sustainability' at PWN is comparable with its use by PWN's network partners. The most important actor, the provincial government, does not use the term in discussions with PWN, because environmental decisions had already been made before the term sustainability became popular. PWN's other network partners, the nature organizations, see the term as relevant to human survival and not to nature. When asked about the content of the concept, nature organizations do not really differ from PWN. DZH has a somewhat broader view of sustainability, but there are also many similarities, such as the view on nature management. Therefore, we see much similarity between these network partners and PWN in how they use and interpret the term. This is the result of ten to twenty years of dialogue and cooperation.

The close cooperation between PWN, the provincial government, nature organizations, and other water companies is also visible in PWN's operations. The provincial government is the genius behind PWN's involvement in nature, because it delegated nature management in the dunes to PWN. Nature organizations make sure their message gets across to PWN by staying in close contact with the provincial government. The strategy of holding on to the right to use the dunes for water production was developed in cooperation with DZH, a company in more or less the same situation. The idea of formulating water production and nature management as equally important goals was developed by DZH and PWN together.

PWN's relationship with consumers is more ambivalent. They support PWN's nature management and the resulting high drinking water price, because they enjoy the dunes as a recreational area. However, citizens living near the dunes have suffered from drainage problems over the past few years. They blame PWN for these problems because they coincided with the reduced extractions. This could seriously damage the citizens' support. Experts say the heavy rainfall of the last few years is a more important cause, but the citizens are not inclined to believe anyone until their problems are solved.

The liberalization debate and the benchmark that followed from it made cost reduction an important new goal for PWN. The provincial government also stimulates PWN to reduce costs, through its Board of directors. PWN agrees with the Ministry of the Environment about keeping the sector within the governmental realm. PWN prefers cooperation with similar companies to competition. Water boards are also seen as potential partners for cooperation. Business customers are relatively unimportant to PWN. Although PWN has noticed that this causes problems for large customers, a respondent from PWN at the operational level still insists that small customers are just as important as large ones.