

Port Environmental Review System 2020 (PERS)

Port of Moerdijk



The Port Environmental Review System (PERS) was developed on behalf of ESPO and the ECOPORTS Foundation

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1. Preamble

1.1 Introduction

EcoPorts is an environmental initiative of the European port sector. It was initiated in 1997 by a number of European ports and has been fully integrated into the European Sea Ports Organization (ESPO) since 2011. EcoPorts aims to increase awareness of environmental protection in the port sector and improve environmental management through cooperation and knowledge-sharing among ports.

The Port Environmental Review System (PERS) is one of the tools of the ESPO for demonstrating that the Port and Industrial Estate Moerdijk complies with various regulations relating to sustainable development and environmental protection. The system not only contains the most important general requirements of the recognised environmental management systems (e.g. ISO 14001), but also takes into account the specific characteristics of ports.

The Port of Moerdijk has held an EcoPorts PERS Certificate since October 2005. This certification is valid for a period of two years. This document has been prepared for the recertification of the EcoPorts Port Environmental Review System of the Port of Moerdijk.

1.2 Port of Moerdijk

The Port and Industrial Estate Moerdijk is an area of five harbour basins directly connected to the North Sea, with an adjacent industrial estate in the Dutch municipality of Moerdijk. The Port of Moerdijk is the fourth seaport in the Netherlands and the most inland seaport. Inland, Moerdijk is connected to various inland waterways, including the two most important waterways in the Netherlands: the Rhine and the Meuse. As a result, Moerdijk is directly connected to all inland waterways from and to the European hinterland.

Overland, the Port and Industrial Estate Moerdijk has a direct connection with motorways and the European railway network. A few companies on the Port and Industrial Estate Moerdijk have their own rail connection and their own loading and unloading platforms.

Furthermore, the pipeline system runs along the Port and Industrial Estate Moerdijk. This pipeline connects the chemical and processing industry between the industrial areas of Rotterdam and Antwerp with branches to Moerdijk and in the direction of Vlissingen and plays a major role in the underground transport of liquids, water, gases and data.

The total port and industrial estate covers an area of 2,635 hectares. A number of established companies own the land themselves. The Port of Moerdijk manages the remaining land and allocates parts of it to companies on a long-lease basis.

The Port and Industrial Estate Moerdijk is divided into various subareas: This division ensures that similar companies are located together (company clustering). This allows the established companies in a subarea to make optimum use of each other's presence.

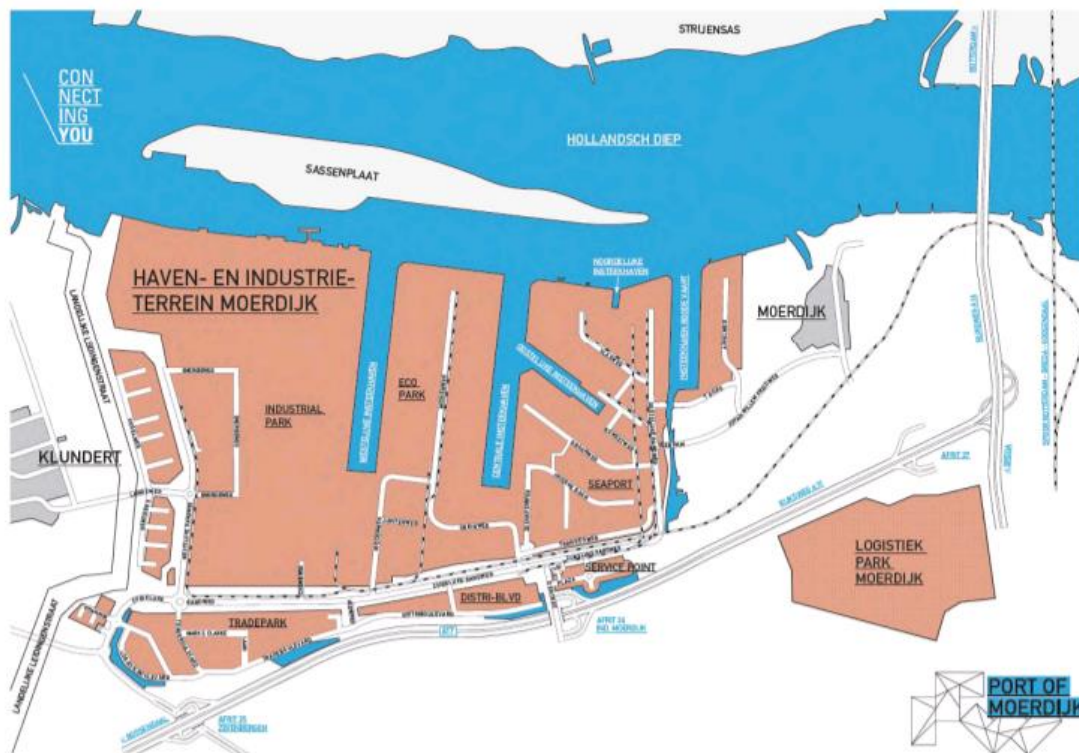


Figure 1.1: Division of the Port and Industrial Estate Moerdijk into subareas

The Port and Industrial Estate Moerdijk distinguishes the following subareas:

- The **Industrial Park**. This park is fully equipped for chemical and chemical-related industry. The chemical cluster continuously creates synergy. Companies exchange basic raw materials and residual flows find their way to new users. Companies also find each other in logistics, for example by bundling chemical products logistically. The Park offers facilities for transshipment and transport. A large number of maintenance companies and logistics service providers have specialised in the chemical sector. The park is directly connected via pipelines to the chemical clusters of Antwerp, Rotterdam and Vlissingen.
- The **Ecopark** is centrally located on the Port and Industrial Estate on the Western Dock. It consists of companies with high sustainability potential, such as energy-related companies or companies that recycle. In the Ecopark, extra attention is paid to sustainability and to ecological entrepreneurship.
- To the east of the Ecopark lies the **Seaport** area. This mainly comprises companies with port-related business activities, such as the storage and transshipment of goods. Service-oriented companies for the shipping industry are also located here.
- The sites of **Distriboulevard**, **TradePark** and **ServicePoint** are located on the south side of the site and to the south of the port's railway. Companies active in transport, distribution and trade are located on the Distriboulevard. The Tradepark is home to trading and logistics companies. Various companies and organisations are located on the ServicePoint, such as Customs, the Marechaussee, the Port of Moerdijk, the Moerdijk Industrial Estate Fire Station, the Port Health Centre and technical maintenance companies. These companies and organisations provide services to the entire port and industrial estate.
- The new **Logistics Park Moerdijk (LPM)** is being developed especially for companies that add value to raw materials and goods. It offers space for large-scale storage and distribution and for value

added logistics. The LPM creates new synergy opportunities for logistics companies and far-reaching interaction throughout the logistics chain. The park is planned to the south of the Klaverpolder junction (A16/A17) and will have a direct connection to the port facilities.

1.2.1 Companies and employment

By 2018, there were 440 companies located on the port and industrial estate. In 2019, 11 new companies settled there. These companies have created an increasing number of jobs in recent years, 10,029 direct jobs and an estimated 8,930 indirect jobs in 2019. The total number of jobs shows an increase of 3.5% compared to 2018 (see figure 1.1).

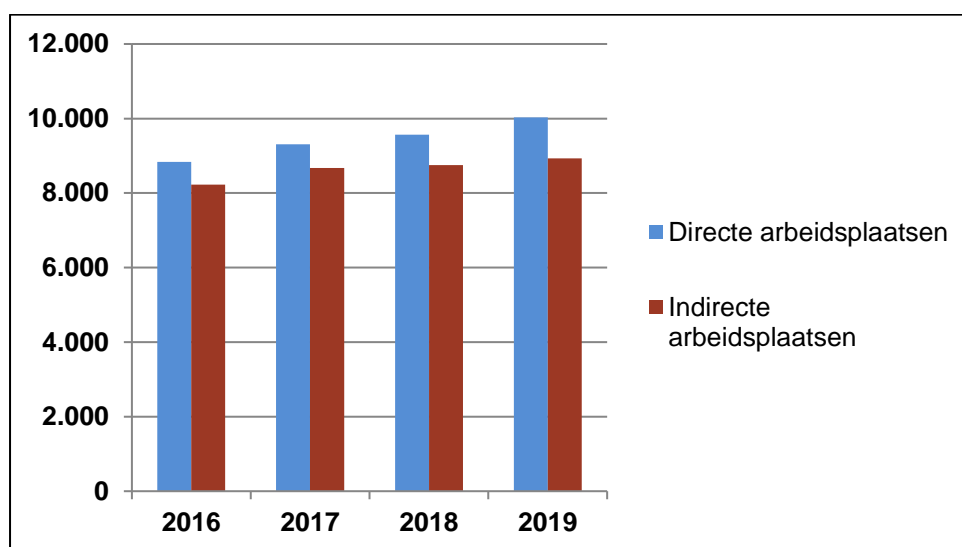


Figure 1.1: Employment at the Port and Industrial Estate Moerdijk (source: Environmental Monitor Reports Port and Industrial Estate Moerdijk + Port of Moerdijk Annual Report)

In 2018, the Port of Moerdijk spent 10 hectares of available land on the establishment or expansion of companies and in 2019 an additional 6.1 hectares of land was added, despite being unable to authorise certain activities, partly due to the nitrogen crisis.

The breakdown by sector is shown in the table below.

Sector	Number of branches
Industry	65
Construction	29
Repair of consumer goods and trade	46
Transport, storage and communication	114
Renting and trading in immovable property, rental of movable property	182
Miscellaneous	5
Total	441

Table 1.1: Number of establishments at the Port and Industrial Estate Moerdijk 2019 by sector (source: Port of Moerdijk Port Annual Report 2019)

1.2.2 Logistics

The Port and Industrial Estate Moerdijk is accessible via deep waterways, rail, road network and a pipeline system.

The most important segments for the port and industrial estate are semi-manufactured products, scrap and metals. Various types of cargo are traded: dry bulk, liquid bulk, containers and general cargo. Breakbulk is also an important segment within the Port of Moerdijk.

Dry bulk consists mainly of minerals, sand, rocks and waste. Slurries, ethylene, propene and styrene make up a large part of the wet bulk. Metal waste and metal products make up the majority of transshipment via containers and general cargo. A growing flow of goods is formed by biomass, such as wood chips, biodegradable plastic and manure. Biomass consists of the biodegradable fraction of agricultural crops, residues and waste from agriculture or forestry and is increasingly used as a fuel for power stations.

Shipping

The total cargo traffic by shipping in Moerdijk is mainly dry goods and bulk. In 2018 there was a small increase in both seagoing and inland waterway vessels in Moerdijk. The share of seagoing shipping in total cargo traffic increased slightly in 2018 compared to 2017, but a decrease of around 5% was seen in inland waterway vessels. As a result, total cargo traffic fell by 2% compared to 2017. The decline in inland waterway vessels is most probably due to the low river water levels in 2018, which compelled vessels to have less draught and hence less cargo.

In 2019, due to Brexit, PFAS and nitrogen problems, the transport of dry bulk in particular (with 52% the largest share in inland waterway vessels) declined nationwide. The transport of wet bulk goods, such as chemical and petroleum products, remained fairly stable. Transshipment by sea decreased by 3.9%. This was mainly due to the weakening of German industry and world trade.

Despite the fall in transshipment, the Port of Moerdijk remains the second container port in the Netherlands after Rotterdam.

Year	Number of ships		Cargo traffic					
			Seagoing vessels (x 1,000 tonnes)			Inland waterway vessels (x 1,000 tonnes)	Shipping (x 1,000 tonnes)	% compared to last year
	sea	inland waterway vessels	unloaded	loaded	Total	unloaded/loaded	Total	
2015	1,769	10,974	3,891	2,389	6,280	10,309	16,589	-1.1
2016	1,900	11,383	3,496	3,224	6,720	10,816	17,536	5.7
2017	2,059	11,734	3,998	3,297	7,295	11,273	18,568	5.9
2018	2,136	12,182	3,983	3,456	7,439	10,722	18,161	-2.2
2019	2,070	10,976	3,822	3,326	7,143	9,459	16,602	-8.6

Table 1.2: Ship movements and cargo traffic (source: Port of Moerdijk Annual Report 2019)

Rail

Improving rail facilities is an important part of the Moerdijk Port Strategy. In recent years, the companies at the Port and Industrial Estate Moerdijk have made investments to intensify rail transport. Mainly chemical products, steel products and consumer goods are transported by rail.

Year	Number of wagons	% compared to last year	Product carried (x 1,000 tonnes)	% compared to last year
2015	21,832	0.6	649	12.1
2016	30,132	38.0	886	36.5
2017	43,445	44.2	1,427	61.1
2018	40,356	-7.1	1,316	-7.8
2019	40,000	-0.9	1,292	-1.8

Table 1.3: Goods transport by rail (source: Port of Moerdijk Annual Report 2019)

Road network

Moerdijk is situated at a motorway junction. It has direct connections to the A16 (Antwerp-Breda-Rotterdam), A59 and A17 (Moerdijk-Roosendaal-Antwerp). These are connected to important East-West connections, such as the A15 and A58. The European hinterland is thus easily accessible.

Pipeline system

The Port of Moerdijk is connected to the underground pipeline system for the transport of (petro)chemical products and gases. The pipeline system connects the industrial complexes of Rotterdam, Moerdijk, Vlissingen and Antwerp. This sustainable form of transport contributes to the economic development of the region and the health and safety of the living environment. The pipeline system is managed by Leidingenstraat Nederland (LSNed). A number of companies at the Port and Industrial Estate Moerdijk make use of this pipeline system.



Figure 1.1: Location of transport pipelines for the transport of hazardous substances on, from and to the Port and Industrial Estate Moerdijk (Source: LSNed Leidingenstraat Nederland).

1.3 PERS for the Port and Industrial Estate Moerdijk

At the Port and Industrial Estate Moerdijk, the Port of Moerdijk, government organizations and companies have been working together for many years on a sustainable and 'green' port. A great deal of attention is paid to operational management for sustainable economic development without increasing the environmental pressure on the surrounding area. By means of innovations, taking advantage of opportunities and closing down decentralised chains, the aim is to keep this environmental pressure low.

The environmental impact of the managed sites is monitored annually. The monitoring data form the basis for the further development and implementation of initiatives and improvements to reduce the environmental impact as much as possible. The Port of Moerdijk reports the environmental information transparently and communicates it to the surrounding areas by means of annual environmental monitoring reports.

PERS also provides support to make the environmental performance transparent and to establish a relationship between the various initiatives.

This report describes how the Port of Moerdijk meets the requirements of the PERS. Wherever possible, reference is made to existing initiatives. The table below shows the criteria from the PERS; it indicates where each criterion is discussed in the report.

The Port of Moerdijk ensures that the report is updated once every 2 years.

Requirement from PERS		Where in the report
1.0	Port Portfolio	Chapter 1, Appendix 1
1.1	Policy Statement	Chapter 2
1.2	Environmental Aspects and Legal Requirements	Chapter 3
1.3	Responsibilities and Resources	Chapter 4
1.4	Conformity Review	Chapter 5
1.5	Environmental Report	Appendix 3
1.6	Best Practices	Chapter 6
	SDM Checklist	Appendix 2

Table 1.4: Requirements from PERS Introduction version 5 December 2016

2. Policy and Objectives

2.1 Port of Moerdijk Environmental Policy Statement

The Port of Moerdijk organises the process of the development, design, construction, distribution, operation, management and expansion of the Port and Industrial Estate Moerdijk.

The Port of Moerdijk strives to achieve an optimal balance between the economic development of the site and its adaptability to its surroundings. The "Triple P" principle, People, Planet, Profit is the starting point in this. This sustainable development is a balanced development process aimed at the resilience and quality of nature, ensuring the physical and mental well-being of the inhabitants and guaranteeing healthy economic development.

The Port of Moerdijk has made an inventory of various parties that can contribute to improving the environmental performance and the sustainability of the estate. Together with these parties (government organisations and companies), the Port of Moerdijk has stated its environmental and sustainability ambitions for the port and industrial estate in the Port Strategy 2030 and has detailed them in various programmes.

The Sustainable Development Goals and the Port Strategy 2030 are the guiding principles for the Port of Moerdijk's CSR policy.

Continuous improvement in the area of the environment and sustainability is assured by:

1. implementing and maintaining an environmental management system;
2. remaining abreast of legislation and regulations and taking the necessary measures for complying with such legislation and regulations;
3. reporting annually on the environmental performance of the Port and Industrial Estate Moerdijk;
4. the continuous improvement of our environmental performance, minimising environmental issues, preventing the environmental impact and reducing raw material consumption;
5. motivating and stimulating our own employees to act in an environmentally-friendly manner;
6. communicating environmental performance to staff, local residents and other parties involved;
7. drawing up criteria for the environmental performance of companies that wish to locate within the Port and Industrial Estate Moerdijk;
8. informing the companies based on the site on how they can improve their environmental performance;
9. deploying the necessary knowledge and resources that are required to perform environmental activities effectively;
10. implementing the necessary measures to protect the quality of the landscape, to preserve bio-diversity and other ecological factors and to strengthen them where necessary.

Moerdijk, July 2020

Ferdinand van den Oever

Director Port of Moerdijk

2.2 Objectives

2.2.1 Moerdijk Port Strategy 2030

The Moerdijk Port Strategy 2030, drawn up in July 2014, contains the strategy endorsed by the Municipality of Moerdijk, the Province of North Brabant and the Port of Moerdijk for the further development of the Port and Industrial Estate Moerdijk up to 2030. The Moerdijk Port Strategy 2030 of July 2014 states that: *“In 2030, the Port of Moerdijk will be the hub of the sustainable logistics and process industry in the Flemish-Dutch Delta. The Port of Moerdijk has an excellent sustainability and safety record. The "Triple P" principle, People, Planet, Profit is the starting point. Sustainable development requires a balanced development process aimed at promoting the resilience and quality of nature, ensuring the physical and mental well-being of the inhabitants and guaranteeing healthy economic development”*.

The Port Strategy indicates that the combination of available space, industry and the ideal location with connections to the hinterland offers ample opportunities for the Port and Industrial Estate Moerdijk to grow further in the coming decades.

An Implementation Agenda for the Moerdijk Port Strategy was drawn up in 2015 and was updated in 2018. The agenda is a joint product of the port authority, the province of North Brabant and the municipality of Moerdijk. The objective is to create system changes that ensure that the Port and Industrial Estate retains an innovative and attractive business environment and develops in balance with its surroundings.

The Implementation Agenda aimed to accelerate a number of specific economic and sustainability themes in the 2030 Moerdijk Port Strategy. These themes are: bio-based and circular, digitization, innovative power, Port of Skills and sustainability.

The following are included in the project portfolio of the implementation agenda:

- Existing projects to be realised that can get acceleration and/or more direction.
- New projects to be developed from which a concrete positive contribution is expected.
- Potential projects to be explored whose feasibility has to be investigated further.

The Implementation Agenda maintains the balance between people, planet and profit as described in the Port Strategy 2030. The economic challenges for Port and Industrial Estate Moerdijk in the coming years lie in increasing the added value (the sum) of individual companies, boosting cooperation between companies and establishing a strong, distinctive positioning.

2.2.2 CSR policy

The Port of Moerdijk's CSR policy further elaborates on the ambitions set out in the Port Strategy. The CSR policy is expressed in three roles:

- The facilitating role towards established firms and possible new companies to be established;
- The role of site manager and port area developer;
- The role of good neighbour and the relationship with surrounding villages and municipalities.

The Sustainable Development Goals that apply to these three roles have been determined and translated into ambitions, objectives and policy lines. This is shown in figure 2.1.

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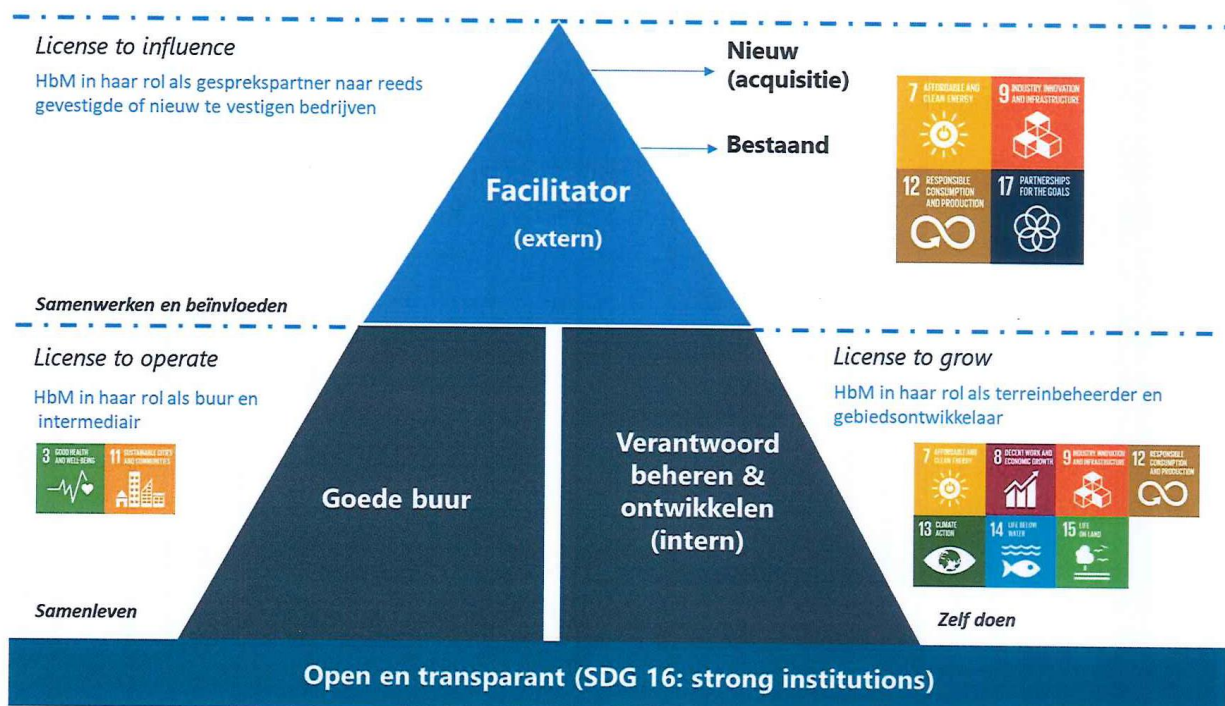


Figure 2.1: Overview of roles and SDGs Port of Moerdijk (source: Port of Moerdijk's CSR policy)

Role as facilitator

Ambitions

Maximum effort to help make the companies located on the port site more sustainable, both for existing and new companies.

Objectives for 2023

1. The joint companies are committed to the Dutch implementation of the Paris Climate Accord and implement the agreed energy and CO₂ reductions and percentages of sustainably generated or sustainably purchased energy.
2. The establishment of (new) companies that have high-quality and innovative forms of recycling and circularity as their core activity.
3. The promotion of initiatives by established companies and new companies on the site that lead to the optimal use of each other's residual flows ('industrial ecology').
4. Facilitating sustainable logistics by encouraging companies to make optimal use of existing modalities and cleaner forms of logistics in order to achieve a modal shift.

Policies

1. Dialogue with established companies is actively pursued in order to obtain commitment to the formulated objectives. The aim is to reach these agreements in a covenant with as many companies on the site as possible. This includes the annual joint monitoring of objectives. This is an extension of the existing Environmental Monitor.
2. When new companies are established, explicit criteria are formulated that give direction to the desired circularity and energy performance.
3. Ensuring the knowledge that the cargo flows passing through the port comply with OECD guidelines and pass this knowledge on to the companies.
4. Stimulating the mutual re-use of flows by starting research into further possibilities for circular solutions within the port area by making use of each other's residual flows.

Role of site manager and area developer

Ambitions

To be the most sustainably equipped port in Europe. This means that the most sustainable variant of available / reliable alternatives is chosen in the design / management of the site. Nature quality, biodiversity, sustainable energy supply and local environmental quality are given an important place in the decision-making process.

Objectives for 2023

1. The Port of Moerdijk is committed to the Dutch implementation of the Paris Climate Agreement and to achieving the agreed energy and CO₂ reductions and percentages of renewable generated or purchased energy for its own energy consumption.
2. The Port of Moerdijk is initiating and co-developing a 'smart' energy system in collaboration with the companies located on the port and industrial estate that accommodates and optimises sustainable energy generation, distribution, purchase and storage across various energy modalities.
3. The Port of Moerdijk's activities will be material neutral in 2023. This means that 100% use will be made of secondary raw materials and that residual materials released on the site will be used elsewhere. A raw materials depot is being developed for this purpose.
4. The office and area certification is at least 'very good' in accordance with BREEM.

Policies

1. The Energy Programme will be updated in order to implement the above objectives. Attention will be focused on reducing the company's own energy consumption, the generation of sustainable energy, the possibilities of energy storage and the first steps towards a smart grid.
2. The infrastructure will be developed in such a way as to stimulate sustainable transport and Value Added Logistics.
3. Biodiversity, energy management and circularity requirements are systematically included in the tender criteria.
4. Concrete indicators are being developed to provide insight into how progress towards the above objectives can be measured and annual progress reported. This is an extension of the existing Environmental Monitor.

Role as a good neighbour

Ambitions

As an industrial port complex, the Port and Industrial Estate Moerdijk has a significant impact on its surroundings. The port provides work for the region, but also has an impact on the quality of the living environment as a result of its industrial activities. The Port of Moerdijk strives to live in harmony with its surroundings in a way that does justice to all the interests at stake. This means growing in economic value and at the same time keeping the environmental space as limited as possible.

Objectives for 2023

1. A structural reduction of incidents that cause a nuisance.
2. A structural good score in a periodic environmental perception survey.

Policies

The Port of Moerdijk is in permanent dialogue with its surrounding area and strives to improve the local quality of life. In doing so, the surrounding area is asked to contribute to the development of policy and initiatives on the port site, where it affects the interests of local residents. This dialogue and initiatives are realised by various bodies. In consultation with the Municipality of Moerdijk, it is also being examined how this could possibly be integrated into the perception survey of the municipality of Moerdijk.

2.2.3 2020 Annual Plan

Every year, the Port of Moerdijk draws up a budget. In this budget, the 2020 Annual Plan has been drawn up on the basis of the various programmes, in which the mission, vision, external influences and concrete actions are included. The following programmes are further elaborated below:

- Spatial Development Environment and Sustainability, Environment;
- Spatial Development Environment and Sustainability, Sustainability;
- Infrastructure and Management; Wet management;
- Infrastructure and Management, Dry management.

Spatial Development Environment and Sustainability / Environment Programme

Vision

The Port Authority achieves sustainable growth and intensification without increasing the environmental pressure on the surrounding area. Due to the closure of decentralised chains, the exploitation of opportunities and innovations, among other things, with regard to renewable energy, the ecological footprint does not increase.

External influences

- The regulations in the field of the Nature Conservation Act and its application are complex and not yet unambiguous;
- established companies have their own responsibility for their dealings with the environment and make their own choices within the framework of the legislation and regulations. This does not always serve the interests of the port authority or other companies.

What do we want to achieve?

The port authority has an up-to-date insight into the environmental impact of the sites it manages by monitoring this. This insight is the basis for improving activities where possible with the aim of managing the environmental space as well as possible and reducing it where possible. The port authority complies with good 'neighbourliness' by communicating factual environmental information in a transparent and timely manner, and by providing insight into environmental performance and possible improvements.

What are we going to do?

1. Noise reduction plan

The potential for expansion and intensification at the Port and Industrial Estate Moerdijk is restricted by, among other things, the established noise limit values (maximum 50dB(A) at 24-hourly level) at the edge of the noise zone.

At one point in particular on the Klundert side, the noise allowance still available is very limited (almost 50 dB(A)). Based on checks carried out in 2019 at many noise-producing companies, a package of measures will be set up in 2020 via the existing noise workgroup (in which not only the port authority but also the municipal and provincial authorities participate as competent authorities).

The aim is to stimulate companies to take noise-reducing measures (via Best Available Techniques). If necessary, the authorization will also be adjusted ex officio. The competent authority will play a supervisory and enforcement role, while the Port of Moerdijk will provide stimulation.

Risks:

- *The focus on noise reduction results in too little reduction;*
- *There is no willingness on the part of companies to cooperate.*

2. Environmental space nitrogen emission monitoring tool

A tool is being developed to be able to divide the nitrogen emissions for industrial plots. At a later stage, it will be examined whether it could also be used for the Port and Industrial Estate Moerdijk.

Risk: Technically, nitrogen emission and deposition is much more difficult to model and manage than noise. This is why an exploration is to be launched.

3. Environmental Monitor 2019 et seq.

The support group around the current environmental monitor is requesting a reassessment of the set-up and target group. The usefulness and necessity of the environmental monitor is not up for discussion. The question is to arrive at a set-up in which the current monitor can be applied more broadly. In consultation with all parties involved (authorities and companies), a study will be started for this purpose.

Risks:

- *Too many different parties pursuing too many different interests, as a result of which there is no shared opinion about the "right" set-up;*
- *Aiming for an excessively complete monitor for which insufficient data is readily available.*

Spatial Development Environment and Sustainability / Environment Programme

Vision

The Port and Industrial Estate Moerdijk is developing into the hub of sustainable logistics and process industry in the Flemish-Dutch Delta. The aim is to create a sustainable, climate-proof and energy-neutral environment with a balance between People, Planet and Profit. The business processes are greened and the ecological footprint is as limited as possible. Companies work closely together in decentralised chains (circular economy) and contribute to a sustainable socio-economic living environment in the region. The Port Authority is an active partner for companies with regard to this and it plays an exemplary role. That is why the Port Authority ensures that its own business operations are as sustainable as possible, including the performance of commercial activities and the management of public space.

External influences

- the feasibility of sustainability opportunities and innovations depends, among other things, on (new) legislation and regulations;
- in order to achieve further successful developments in the field of sustainability, the port authority is depending on the cooperation, commitment and innovative powers of companies and licensing bodies.

What do we want to achieve?

The port authority connects existing and new companies in order to be able to use residual flows such as steam, hot water and CO₂ as renewed raw materials. The development and operation of new energy systems will make the current electricity network more efficient and sustainable. All these developments contribute to the realisation of a climate-proof and energy-neutral port and industrial estate. The port authority acts in an ecologically responsible manner in its management and responds to ecological opportunities such as temporary nature.

What have we done?

1. Establishment of the CSR policy

The CSR policy was drawn up by Port of Moerdijk in October 2018. The driving factors of the CSR ambitions drawn up are:

- the energy neutrality of the complex;
- the greening of the existing chemical and process industry;
- the further expansion and promotion of already integrated modes of transport:

- across the water,
- via the pipelines and
- on the railways;
- a strong bond with the surrounding area.

These ambitions have been further elaborated in the CSR policy. The Sustainable Development Goals (SDGs) launched by the United Nations have been taken as a starting point. These goals and targets have been analysed in terms of their applicability and significance for the port authority. The CSR policy has a horizon up to 2030 with an intermediate station in 2023.

2. BREEAM certificate obtained

In September 2018, the Port of Moerdijk received the BREEAM certificate for the Port and Industrial Estate Moerdijk. This new BREEAM-NL Area 2018 assessment directive assesses the sustainability performance of already existing areas. The Port and Industrial Estate was rated as VERY GOOD (3 stars).

What are we going to do?

1. 2021 Moerdijk Energy Programme

The 2021 Moerdijk Energy Programme was adopted in 2017. This Energy Programme is a first crucial step towards making the port and industrial estate, as set out in the Port Strategy for Moerdijk 2030, energy-neutral. However, the Energy Programme originated before climate agreements were reached. In 2020, the Moerdijk Energy Programme, which has already been developed, will be recalibrated so as to include the Climate Agreement. A plan of approach will then be drawn up for the implementation of the programme.

Risk: Companies do not cooperate.

2. Second phase of preparation of solar park

In 2018, the port authority carried out a feasibility study into the possibilities of developing a solar park on the port and industrial estate. Based on the results, the decision was taken to develop the first phase. Implementation started in 2019. For the second phase, a development project will be set up in collaboration with the Brabantse Delta Water Board for the construction of solar fields on and around the flood defences.

Risk: Placement on the flood defences could encounter technical problems.

3. Sun on company roofs relief project

Although SDE subsidies have been applied for over 66 MW of solar panels on company roofs in recent years, it is not clear what the full potential is for the rest of the site. This is still being investigated. Subsequently, the intention is to motivate companies where there is potential for a roof installation and, if necessary, to help them during the implementation process.

Risk: Companies do not cooperate.

4. Robust nature implementation plan

Conservation targets for flora and fauna have been set for the two Natura 2000 sites around the port and industrial estate. These are expressed in terms of quality and quantity. Initiatives with a negative impact on flora and fauna are in principle not allowed, except when the designated habitat types, habitat species and birds are above their so-called target; in that case nature is classed as robust. Various environmental aspects affect this, with nitrogen and noise being the most relevant to our area. The "robust nature through alternative measures" plan to be drawn up explores the current and future state of objectives. In the event of calculated negative developments, we will investigate whether there are still opportunities for the expansion of the port and industrial estate by investing in nature now.

Risks:

- *It is uncertain whether this plan can be implemented legally and whether adequate countermeasures are available for the possible reduction of conservation objectives.*
- *Nature and environmental associations do not support the plan.*
- *Due to the continuing legal uncertainties surrounding the interpretation of legislation and regulations on nitrogen deposition, the investigation has not yet started.*

Programme Infrastructure and Management, / Wet management

Vision

The port authority has an easily accessible and available wet acreage, including the docks and bed elevation of the harbour basins. With optimum accessibility to and availability of the acreage, the port authority facilitates the business community at an acceptable cost. As a coordinating organisation, the port authority has outsourced the daily management of this acreage to a market party under an integral management contract. The wet acreage has guaranteed quality and availability, which is essential for the business operations of the port authority and its customers. Legislation and regulations, corporate social responsibility, managing with vision and respect for the environment and the living environment are central to this.

External influences

- correct and incorrect use of the acreage by third parties;
- climatic conditions, such as water quality and temperature;

What do we want to achieve?

The managed capital goods at the port, docks and piers are easily accessible and available for the seagoing and inland waterway vessels that reach the Port and Industrial Estate Moerdijk. Sustainability, a lifecycle costing approach, proactive maintenance management and system-oriented contract management (SCB) are the starting points for this.

What are we going to do?

Water Management Plan

In 2018, a Water Management Plan (WMP) was drawn up together with the water board, municipality and the business community. The plan was adopted in 2018. Under the leadership of the Hollandse Delta Water board the WMP was translated into a water management action plan for 2019-2021.

Risks:

- Without established frameworks there can be no 'dot on the horizon' for detailing a concrete, robust water system;
- if there is no clear elaboration for the robust integral water system it cannot be put out to tender. A proper risk-based approach cannot then be contracted.

Programme Infrastructure and Management, / Dry management

Vision

The Port Authority strives to keep the Port and Industrial Estate Moerdijk clean, whole and safe. Sustainability, the (further) development of areas within the management area and optimal availability go hand in hand. With optimum availability of the acreage, the port authority facilitates the business community at an acceptable cost. The acreage thus forms a business card for the port authority and the established companies on the port and industrial estate. The port authority has outsourced the day-to-day management of the public area to a market party under an integral management contract. The contract requirements are based on system-oriented contract management based on established standards such as NEN and CROW. In this way, the port authority has also determined the budgets for the medium and long term, so as to ensure continuity. Continuous attention to aspects such as legislation and regulations, corporate social responsibility, management with vision and respect for the environment and the living environment has been and will continue to be guaranteed.

External influences

- the way and extent to which users use public space;
- greater and systematic shifts in the modal split;
- changing laws and regulations;
- technological and climatic developments.

What do we want to achieve?

The capital goods roads (including road furniture), sewers (including pumping stations), greenery, works of art and public lighting managed by the port authority are easily accessible and available. Sustainability, a life-cycle costing approach, proactive maintenance management and system-oriented contract management (SCB) are the starting points here. In this way, these capital assets contribute to the realisation of the ambitions and developments of the port and industrial estate. The port authority can demonstrate the state of its entire acreage at all times. The port authority can remotely control the management according to functional requirements. In this way, the acreage continues to function as appealing advertisement for the port authority and the business community. The sustainability ambitions of the port authority will also be realised in this programme. In this way, the port authority ensures that companies and employees find working on and visiting the port and industrial estate a pleasant and enjoyable experience.

What are we going to do?

Incorporate sustainability and innovation as a performance in management contracts and partnerships

In 2019, the port authority has coordinated its ambitions in the field of sustainability and innovation with suppliers and management agreements with all fellow managers such as the water board, ProRail, the province, municipality and Rijkswaterstaat by means of commitment, by anchoring performance in the field of smart and sustainable maintenance in contracts with clear incentives for appropriate improvement and investment proposals.

Risk: The inability to translate the philosophy in sufficiently concrete terms into contract texts in which performance can be measured and settled.

3. Register of environmental aspects and legal requirements and performance indicators

3.1 Procedure: register of environmental aspects and legal requirements

Purpose

The aim of compiling a register of environmental aspects and legal requirements is two-fold, i.e.:

- To identify environmental aspects and determine their importance and priority in order to control those aspects;
- To gain insight into the applicable and future legislation and regulations and ensure that those regulations are complied with.

Area of application

The following components are included in the register:

- port-related activities;
- site-related activities;
- organisational/environmental-related activities;
- the companies based on the site;
- calamities and incidents.

The Port of Moerdijk has relatively little influence on the environmental aspects of the companies based on the site. These aspects are treated in a general manner.

Roles and responsibilities

- The Environment and Sustainability Advisor is responsible for the preparation, maintenance and management of the register of environmental aspects and legal requirements.

Procedure

a. Making an inventory of environmental aspects

The various activities that take place on and around the Port and Industrial Estate Moerdijk and the consequences these have on environmental performance are catalogued in the register. For each activity, an indication is given of which environmental aspects it influences, namely: waste, waste water, soil, use of raw materials, use of natural resources, air, noise and vibration, energy and external safety.

b. Establishing the applicable environmental legislation and regulations

For each activity, a review is made of which environmental rules and regulations apply. The applicable legislation and regulations are listed in the rules and regulations summary. This contains an explanation of the pertinent laws and rules.

c. Updating the register

The register is updated at least once every 2 years or if major changes occur in the environmental aspects and/or legislation and regulations.

d. Reviewing legislation and regulations

After the register has been updated, an external expert checks compliance with all the relevant legislation and regulations (see also chapter 4 of this manual). This check serves as input for the conformity review. If necessary, improvement actions are implemented.

Documents

The register is an Excel file that can be consulted at the Port of Moerdijk.

3.2. Performance indicators

Since 1999, the (environmental) information available from companies and (governmental) agencies on the Port and Industrial Estate Moerdijk has been collected and presented in an environment monitoring report. The table below shows which performance indicators are used for reporting.

Indicator	Unit
Employment	fte
Logistical movements - water	Number of ships Transshipment of goods in tonnes
Logistical movements - rail	Number of wagons Transport of goods in tonnes
Energy use: <ul style="list-style-type: none">• Electricity consumption;• Natural gas consumption;• Heat;• Oil;• CO₂ emission.	MWh m ³ TJ tonne tonne CO ₂
Air emissions (various parameters)	Kg
Water usage (various streams)	m ³
Emissions via water	p.u.
Waste (streams per processing unit)	tonne
Noise level	dB(A)
Complaints and nuisance	Number

Table 3.1: Performance indicators

The 2018 Port and Industrial Estate Moerdijk Environment Monitoring Report provides further details about the environmental performance of the port and industrial estate. Please refer to appendix 3 of this report.

The public version of the Environment Monitoring Report 2018 can be found at:

<http://publicaties.duurzameuitgave.nl/publieksversie-milieumonitor-2018>

4. Duties, powers, responsibilities and resources relating to environmental aspects

4.1 Port of Moerdijk

The Port of Moerdijk is responsible for organising the development, design, construction, distribution, exploitation, management and expansion of Moerdijk Port. It also makes its knowledge and experience available to third parties. The Port of Moerdijk is a central control organisation. The operational execution is outsourced to external suppliers.

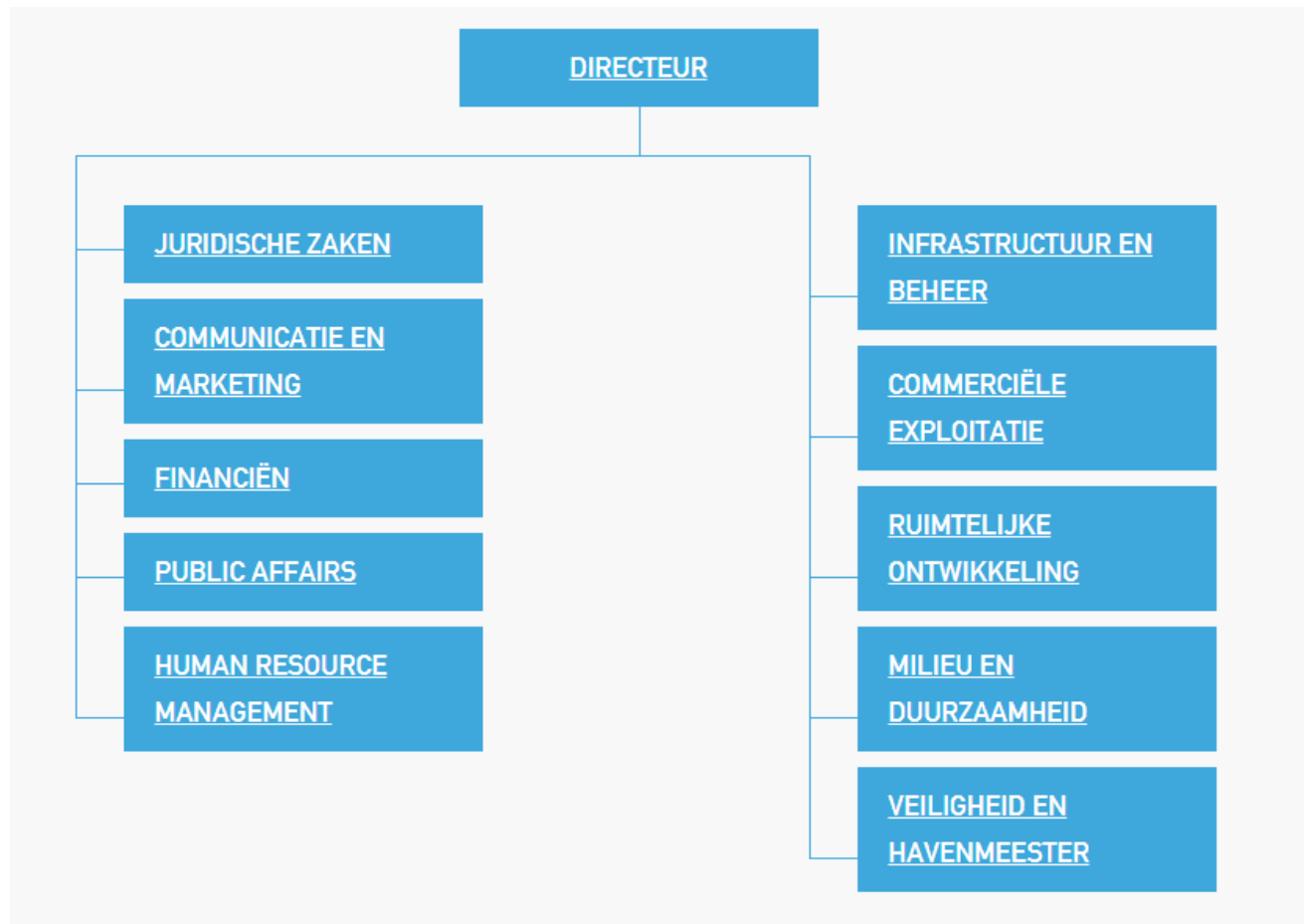


Figure 4.1: Organigram of the Port of Moerdijk

4.2 Internal environmental roles and responsibilities

The table below shows who is responsible for which environmental tasks within the Port of Moerdijk.

Task	Function
Port operations (dredging)	Infrastructure and Management Programme Manager
Port operations (navigation)	Harbour Master – Port security – Safety Programme Manager
Port operations (shipping)	Harbour Master – Port security – Safety Programme Manager
Port operations (terminals)	Harbour Master – Port security – Safety Programme Manager
Jetty/Warf management	Harbour Master – Port security – Safety Programme Manager
Site management	Programme manager Infrastructure and Management - Harbour Master – Port security – Safety Programme Manager
Strategic planning	Director - Environment and Sustainability Advisor - Spatial and Area Development Programme Manager
Supplies acquisition	Infrastructure and Management Programme Manager
Operator Licensing/Permit	Environment and Sustainability Advisor
Quality management	Director
Emergency planning	Harbour Master – Port security – Safety Programme Manager
Marina/slipway management	N/A
Environmental document management	Environment and Sustainability Advisor
Environmental data management	Environment and Sustainability Advisor
Soil pollution assessment	Infrastructure and Management Programme Manager
Air quality monitoring	Spatial and Area Development Programme Manager
Energy and Carbon Footprint monitoring	Environment and Sustainability Advisor
Water quality monitoring	Infrastructure and Management Programme Manager
Noise management	Spatial and Area Development Programme Manager
Vehicular management of terminal traffic	Harbour Master – Port security – Safety Programme Manager - Infrastructure and Management Programme Manager
Communication with external stakeholders about environmental subjects	Environment and Sustainability Advisor
Management Representative	Environment and Sustainability Advisor
Coordinating environmental management throughout the port	Environment and Sustainability Advisor
Reviewing of environmental issues and legislation	Environment and Sustainability Advisor
Civil engineering	Infrastructure and Management Programme Manager
Public relations and marketing	Communication and Marketing Advisor – Public Affairs Advisor
Checking new establishments	Commercial Operations Programme Manager
Port authority work boats	Harbour Master – Port security – Safety Programme Manager

Table 4.1: Roles and responsibilities within the Port of Moerdijk

4.3 External environmental tasks and responsibilities

For a number of environmental tasks, responsibility does not lie primarily with the Port Authority but with its external partners (or companies themselves). This could be the province of North Brabant but also, for example, the municipality of Moerdijk. These responsibilities are sometimes delegated to working groups consisting of several organisations including the Port Authority (see table below). Companies on the Port and Industrial Estate are, of course, primarily responsible for complying with the laws and regulations that apply to them.

Theme	Responsible external parties
Noise	Province of North Brabant Municipality of Moerdijk Central and West Brabant Environmental Service
Environmental quality monitoring Air, noise, water, environmental complaints, environment, energy.	Province of North Brabant Municipality of Moerdijk Port of Moerdijk
Liveability Moerdijk Environment Table (Moerdijk Environment Table; communication with local residents. https://omgevingstafel-moerdijk.nl/)	Port of Moerdijk Shell Nederland Chemie Sivomatic Afvalstoffen Terminal Moerdijk Stolt Haven Moerdijk Attero BIM Residents from areas Klundert, Moerdijk, Zevenbergen, Zevenbergsche Hoek Residents from Strijen and Strijensas
Air quality (eNose network)	Province of North Brabant Municipalities of Moerdijk and Hoeksche Waard Central and West Brabant security region Shell Nederland Chemie Afvalstoffen Terminal Moerdijk Attero CNC

Table 4.2: External responsible parties

4.4 Resources

An Environmental and Sustainability Advisor has been appointed within the Port of Moerdijk. This is the primary point of contact when it comes to environmental and sustainability activities on the Port and Industrial Estate. The Environment and Sustainability Advisor is accountable to the RO/GO Programme Manager. Financial resources have been made available for the various projects (see table below).

Costs 2020	Resources
Personnel costs	EUR 160,000
Environmental monitoring	EUR 40,000
Various working groups	EUR 15,000
Consultancy costs	EUR 200,000
Dredging	EUR 540,000

Table 4.3: Resources

5. Conformity Review

5.1 Procedure

Purpose

Assessing the operation of the environmental management system. The results are used to frame measures for improving environmental performance.

Area of application

The following subjects are covered during the conformity review:

- the environmental policy and objectives;
- expected changes (new premises, layout of site, legislation and regulations);
- register of environmental aspects and requirements;
- stakeholders' analysis;
- internal communications.

Roles and responsibilities

The Environment and Sustainability Advisor is responsible for the preparation of the conformity review. The Environment and Sustainability Advisor, together with the director, performs the conformity review.

Procedure

a. Scheduling of conformity review

The Director and the Environment and Sustainability Advisor will schedule a meeting every two years to discuss the conformity review.

b. Preparing management review

The Environment and Sustainability Advisor ensures that the data required for the conformity review report is collected.

c. Discussing data

The Environment and Sustainability Advisor and the Director discuss the data together and determine the points for improvement.

d. Modifying report

The results and points for improvement are reported by the Environment and Sustainability Advisor. If necessary, other documents are also amended, such as policy, objectives etc.

Documents

The conformity review is reported in paragraph 5.2 of this report.

5.2 2020 Conformity Review Report

The conformity review in the context of PERS certification took place on 22 July 2020. This conformity review was performed by:

- Mr F. J. van den Oever (Port of Moerdijk Director);
- Ms A. Govaart (Port of Moerdijk Environment and Sustainability Advisor);
- Ms C. Tesselaar (BMD Advies Zuid-Nederland Advisor)

Policy and Objectives

The 2030 Moerdijk Port Strategy has always been a priority for the Port of Moerdijk, especially because it clearly formulates the tasks for the entire area around the Port of Moerdijk and the activities of all stakeholders. In recent years, these activities have been divided up without this being so explicitly stated. Despite the fact that many activities and projects have now been realised, the question of who is responsible for which task and how the responsibility should subsequently be translated is becoming increasingly prominent. For this reason, a project is currently underway to determine a corporate strategy for the Port Authority based on the 2030 Moerdijk Port Strategy and the Government's Port Memorandum 2020-2030. This renewed corporate strategy is expected to be finalised in the last quarter of 2020 and will form the starting point for the 2021 budget and beyond and the updated CSR policy for 2020-2025.

Important in the renewed corporate strategy is the role that the Port of Moerdijk assumes in the various tasks; as an entrepreneur, stimulator or facilitator. These roles will be defined definitively and will also form the starting point of the new CSR policy to be formulated. The current Sustainable Development Goals will remain in place and the objectives for 2023 formulated in 2018 will also be further elaborated.

Developments

In order to make its sustainability ambitions clearly recognisable, the Port and Industrial Estate Moerdijk will be the first industrial estate in the Netherlands to be certified at the 'Very Good (***)' level in 2018 in accordance with the new BREEAM-nl Area assessment guideline. This means that the port site will be recognised by the market as an attractive location for the realisation of sustainable buildings and developments.

To serve as an example for the entire port and industrial area, the office of the Port Authority has been BREEAM In-Use certified for the second time.

Over the past year, the Port Authority has drawn up requirements for the management and maintenance of the dry infrastructure in the field of sustainability and innovation. An important aspect in this respect is making trade-offs in the field of revenues, costs & risks. These considerations are made on the basis of various policy themes, including the environment and sustainability, innovation and CSR. These subjects are included in the port authority's risk matrix and the contractor must also take account of them in his considerations.

The creation of a raw materials depot will be considered for application elsewhere on the site of released residual materials.

The circular economy is one of the spearheads of the implementation agenda resulting from the port strategy. This includes research into how companies can make better use of each other's strengths. Particular attention will be paid to the development of a collective energy infrastructure and the stimulation of research and development.

To really take circularity further, many companies in the Netherlands are running up against waste legislation. In the Netherlands, waste almost always remains waste and is not seen as a raw material in the context of bio-based industry, as is the case in many EU countries. An inventory is currently being made of circular products that therefore cannot be traded.

In recent years a great deal has been invested in sustainable energy at the port and industrial estate. For example, a wind park of 7 windmills will be built along the Southern and Western Randweg. The park will be inaugurated in the second half of this year.

Phase 1 for the solar park will also be completed in 2019 after obtaining the SDE subsidy. The solar park consists of 8 fields of solar panels divided over strips along the ring roads and will be operational next year. At the same time, the port authority has a stimulating role to encourage the business community to take initiatives to generate sustainable energy. For example, Shell has installed a large solar park on an unused part of its site and various other companies have invested in solar panels on the roof of their buildings.

Due to the nitrogen developments and the overburdening of the Natura 2000 areas, it is now not possible to establish new companies that cause some emissions or expand existing companies on the Port and Industrial Estate Moerdijk. In cooperation with the province of North Brabant and the municipality of Moerdijk, an investigation is under way into how establishment can still be possible without further damage to the environment. This involves looking at whether and how companies can offset internal and external costs, in combination with research into suitable source measures. It also examines the opportunities that circular working offers to reduce nitrogen emissions (and CO₂).

Stakeholders

A stakeholder analysis has recently been carried out within the framework of Public Affair Strategy. This resulted in a long list of stakeholders in which 13 priority stakeholders were identified. The longlist is subdivided into:

- Administrative: national, regional, local and international.
- Market: public private, industry association, companies.
- Politics
- Internal
- Society: national and regional.

Stakeholders make an important contribution to the realisation of the ambitions, projects and objectives of the Port and Industrial Estate Moerdijk. The commitment of the stakeholders is crucial owing to the specific knowledge that is available, the network that can be applied and the joint ownership of the projects.

Environmental aspects register

Most of the environmental aspects relate to the established companies and activities in and around the port. The Port of Moerdijk plays a stimulating role in this respect in order to achieve improvements together with the responsible parties. The port authority has included this responsibility in its role as facilitator and area developer of the Port and Industrial Estate Moerdijk.

Complaints

The number of complaints received has fallen sharply in recent years. This is also due to a change in the approach to complaints. The focus is now less on the number of complaints received, but has shifted to clusters of complaints and tracing their source. It has emerged that complaints can often be clustered into a single traceable source or incident.

In addition, companies themselves have done a lot to prevent complaints by announcing the planned nuisance in advance via the Environment Table. The Environment Table of the Port and Industrial Estate Moerdijk is an initiative of the Port of Moerdijk, where companies from the Port and Industrial Estate Moerdijk and local residents discuss, ask questions and share information about the port and industrial estate. Current developments in and around the Port and Industrial Estate Moerdijk are also discussed so that local residents can identify any inconvenience. A clear example of this is Shell, where last year major maintenance took place that involved long periods of flaring. There was a great deal of communication about this with the surrounding area and this was reflected in a limited number of complaints.

Internal communications

The environment and sustainability are on the agenda of the MT and staff meetings, but also that of the Supervisory Board and shareholders. Our own staff are kept informed of developments in the field of the environment and sustainability via the Port of Moerdijk intranet site.

The environment and sustainability also play an explicit role in the staff's working visits. Last year, for example, an excursion took place to Blue City, a so-called circular hub as a model workplace for innovative

entrepreneurs and companies. The employees also went on a local safari in the 57-hectare temporary nature reserve on the industrial park, looking for the so-called Moerdijk Big Five.

6. Solution forms

Port of:	Moerdijk
Country:	The Netherlands
Contact person:	M. Baartmans
Position:	Commercial Operations Programme Manager
Email:	m.baartmans@portofmoerdijk.nl
Environmental issue: Waste, circular economy, reuse of raw materials.	
Relevance to the 5Es framework of the ESPO Green Guide: Exemplify / Enabling / Engaging / Enforcing	
<p>Pyrolysis</p> <p>Pyrolysis is a thermal decomposition process in which biomass, plastic or waste is decomposed by heating it to a high temperature without the presence of oxygen. Pyrolysis basically produces three products: gas, oil and a coke-like residue.</p> <p>Pyrolysis takes place at a temperature between 400 and 800 °C. Pyrolysis of biomass at temperatures up to 200 to 400 °C is known as torrefaction, while pyrolysis of plastics at temperatures up to 400 to 450 °C is called depolymerisation.</p> <p>Pyrolysis reduces CO₂ emissions and gives a second life to materials previously considered to be waste. The technology is therefore high up in the waste hierarchy, a standard that indicates how environmentally friendly a waste treatment method is.</p> <p>Pyrolysis testing ground</p> <p>In the Moerdijk Pyrolysis Laboratory, various parties are investigating how residual flows can be processed into valuable products using pyrolysis technology. Pyrolysis is an incineration technique that gives waste products such as discarded pallets, used plastic foil, but also walnut shells, sewage sludge or old car tyres, a second life. By thermally recycling this type of waste, it no longer disappears into an incinerator. It therefore cuts both ways: less waste streams and therefore less environmental pollution and CO₂ emissions. And, at the same time, new, valuable products made from residual flows. In fact, in this context, we are no longer talking about waste or residual flows, but about raw materials. In this way, this process contributes to the circular economy.</p> <p>Pyrolysis partners</p> <p>The Port and Industrial Estate Moerdijk has been chosen as the location for the pyrolysis testing ground. The reason for this is the presence of water, road and rail transport as well as various waste and residual flows. Moerdijk is also an important port in the Biobased Delta. The Port of Moerdijk is making the former Tetra Pak location available to the cluster.</p>	

Port of:	Moerdijk
Country:	The Netherlands
Contact person:	H. Schakenraad
Position:	Infrastructure and Management Programme Manager
Email:	h.schakenraad@portofmoerdijk.nl
Influence on environmental aspects: Nature, habitat, soil contamination, air and water quality	
Relevance to the 5Es framework of the ESPO Green Guide: Exemplifying / Enabling	
<p>Nature Development and Management at the Port of Moerdijk</p> <p>The Port and Industrial Estate Moerdijk is home to a number of protected species for which the Port of Moerdijk has been granted an area exemption. These species mainly occur on plots of land still to be issued by the Port of Moerdijk. To this end, the Port of Moerdijk has drawn up a development and management plan, which shows the added value in the final phase of this development.</p> <p>The Port and Industrial Estate Moerdijk is intended for the heaviest category of chemistry in the Netherlands. The site of the port and industrial estate has been designed in such a way that it can be handled as efficiently as possible. In practice, this means that, apart from the cables and pipelines and existing green structures, everything is issued to customers active in chemicals, dry and wet bulk, containers and other logistics activities. This avoids fragmentation of the chemical and industrial sectors in West Brabant.</p> <p>The added value for nature stems mainly from the green corridors between the companies and cable and pipeline strips. A change in ecological management shows an increase in species richness in flora and fauna.</p> <p>In addition to the existing cable and pipeline strips and green spaces, the Port of Moerdijk wants to offer added value in the redevelopment of Moerdijk Plaza and the upgrading of the Appelzak compensation area near the core of Moerdijk. Both projects are elaborated further in Appendix 4.</p>	
Link: Appendix 4	

APPENDIX 1: Profile of Port and Industrial Estate Moerdijk

See: http://www.ecoports.com/user/port_profile

APPENDIX 2: SDM CHECKLIST

(to be added as a separate appendix)

APPENDIX 3: 2018 Environment Monitoring Report



Environmental Monitor 2018

Moerdijk Port and Industrial Park



November 2019

FINAL
VERSION 3.0
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TRANSLATED ON SEPTEMBER 4, 2020

CLIENT: MOERDIJK PORT AUTHORITY
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Foreword

As is done every year, an Environmental Monitor for the Moerdijk Port and Industrial Park has been drawn up for 2018. Together with our partners, the province of Noord-Brabant, the municipality of Moerdijk, Waterboard Brabantse Delta, drinking water company Brabant Water, and companies on-site, we collect the data to show everyone 'how we are doing'. In 2018 we may once again conclude that 'we' are doing well in terms of environmental impact.

Last year the Moerdijk Port and Industrial Park grew in several areas: we docked more ships, welcomed eight new companies to our port and industrial park and issued 10 hectares of land. Meanwhile we achieved a great deal in terms of our ambition to become an energy-neutral port, where the economy and ecology are perfectly balanced. We are for instance the first in the Netherlands to receive the BREEAM certificate for sustainability. Also, the European Sea Ports Organisation (ESPO) certified the port of Moerdijk for the sixth time for its sustainability and environmental performance. That is something we are very proud of!

What is also striking is that substantially more renewable energy was generated in 2018 versus 2017. Companies are becoming more self-sufficient in their energy needs and are increasingly using renewable energy sources for this purpose, primarily solar panels. It must be said though that electricity consumption in 2018 was considerably higher than in 2017. This is mainly due to the switch from gas as a source of energy to electricity. This transition is also reflected in other figures: natural gas consumption has fallen sharply and with it our CO₂ emissions in 2018. Considering the ambitions, we drew up together for 2030, I think this is a positive development.

I also see the development of (temporary) nature reserves of no less than 17 hectares as a positive development; something else we are proud of. The Port Authority is investing heavily in this, and several companies on our site are also contributing to it. In March 2018, for example, 40 bat boxes were put up by volunteers, so the bats in this area always have a place to live. That this has been effective was proven short after this action two Nathusius' pipistrelle bats have already been observed in one of the bat boxes attached to our own office. Wonderful!

Ferdinand van den Oever
Director Moerdijk Port Authority

Summary

Moerdijk Port and Industrial Park aims to be the most important hub for sustainable logistics, and the sustainable chemicals and processing industry in the Flemish-Dutch Delta by 2030. However, sustainable economic development can only take place when combined with improving the region's livability and increasing the resilience and quality of nature and the locality. For this reason, we monitor the environmental performance of the port and industrial park annually based on seven themes: energy, air, water, waste, noise, nature, and environmental complaints.

Despite the increase in activity at the Moerdijk port and industrial park in 2018 (increase in production, land issuance and employee numbers), many aspects of its environmental performance remain unchanged. This perfectly reflects the ambition to allow the port and industrial park to grow, while at the same time ensuring the environmental burden does not increase. The results of the Moerdijk 2018 Environmental Monitor show that the companies on the port and industrial park are taking action relating to sustainability and the environment. This is being done both in relation to (new) legislation and regulations, and unilaterally. Below is a brief overview of the results per theme.

Energy

In 2018, the purchase and generation of electricity increased by 55% versus previous years. This is caused by an increase in production and a switch from gas to electricity as a source of energy. Natural gas was used less as a source of energy in 2018. As in previous years, in 2018, the use of oil as a source of energy was relatively low. Strikingly, there was a decrease in the use of residual heat. This is due to decommissioning of a power plant at the port and industrial park. This residual heat has of course not disappeared but was used and now booked as 'self-produced renewable energy', which also explains the large increase in the purchase and generation of electricity. Remarkably, a large portion of the electricity used at the port and industrial park is generated sustainably, often from on-site production processes.

Air

CO₂ emissions in 2018 were 16% lower than in 2017. NO_x emissions were 17% lower. This is due to the closure of a power plant at the Moerdijk port and industrial park.

The EU air quality standards for particulate matter (PM₁₀), nitrogen dioxide (NO₂) and benzene were not exceeded in the residential areas of Moerdijk, Klundert, Zevenbergen and Strijensas in 2018. The annual average concentrations of particulate matter (PM₁₀), NO₂ and benzene remained the same in 2018 versus 2017, despite growth in economic activity.

Water

In 2018, more than 81% of the water used at the port and industrial park consisted of industrial water – water of a slightly lower quality than drinking water. There is no specific trend in the consumption of industrial water over the years 2013-2018. In 2018, the companies at the port and industrial park consumed 1,238,239 m³ of *drinking water*. There is an increase of 28,791 m³ (2.4%) versus the previous year. This reverses the downward trend in the period 2012-2016. The reason for this is probably the increasing production at companies on site.

For wastewater, more than 5.7 million m³ less wastewater was discharged through the sewer system in 2018 than in 2017. This is due to more conscientious business management. Less wastewater is produced, with a lower level of pollution. The downward trend continues.

Waste

In 2018, the companies on-site disposed of a total of more than 2.3 million tons of waste. This is almost the same as in 2017. In 2018, there was a large decrease in the disposal of hazardous waste from the Moerdijk Port and Industrial Park, especially outside the Netherlands. The total amount of waste processed decreased by 27% versus the previous year (not all waste processors worked at full capacity in 2017). Moreover, in 2018, 78% of the waste flows were reused or recovered, representing an increase of 6% versus 2017. There also was an increase in waste separation. In 2018, less waste was incinerated and taken to landfills.

Noise

As in previous years, in 2018, noise levels in the locality of the Moerdijk port and industrial park remained within the limits of the 50 dB(A) noise contour. Additionally, to check the model-based calculations, noise measurements were carried out in 2018 at Klundert by the Central & West Brabant Environment Agency (the OMWB). These measurements confirm that noise levels remain within the limits of the stipulated noise contour.

Nature

The Moerdijk Port Authority invests in nature in a variety of ways: with green buffer zones, with butterfly zones, ecological mowing management, and bat boxes. Various companies at the port and industrial park also contribute to the objectives for nature. Some of the measures described are also taken on private grounds.

Environmental complaints

In 2018, 139 complaints related to the Moerdijk port and industrial park were reported, almost 14% less than the previous year. The decreasing trend in the number of complaints since 2014 continued in 2018. Over 80% of all complaints in 2018 related to air/odor. In 2018, 10 noise-nuisance complaints were reported, the same number as in 2017. Several complaints (9 in total) also involved health problems.

1. INTRODUCTION

1.1 The Environmental Monitor

At the Moerdijk port and industrial park, the Port Authority, government organizations, and private companies have been working together for many years on a leading, sustainable port and industrial park at Moerdijk. One of the key principles of the 2030 Moerdijk Port Strategy is the observance of the 'Triple P' (People, Planet, and Profit). The idea behind this is that sustainable economic development only takes place when it goes hand in hand with promoting the resilience and quality of nature and strengthening the well-being of local residents. Improvement of one should not come at the expense of the other. The North Brabant provincial authorities, the municipality of Moerdijk, Waterboard Brabant's Delta, Brabant Water, corporate representatives and the Moerdijk Port Authority jointly monitor annual environmental performance using the Environmental Monitor.

1.2 Information used

Every year, the Monitoring Working Group collects the available (environmental) information from companies and (government) agencies that are subject to licensing requirements. This information is then processed and shown in the Environmental Monitor with the aim of:

- providing guidance and information to local residents and companies about the situation and trends relating to environmental aspects;
- initiating activities focused on sustainability at the Moerdijk port and industrial park and monitor their effects;
- providing insight into opportunities for further sustainability at the port and industrial park.

NB The Monitoring Working Group collects the data from companies subject to licensing. Each year, these companies draw up an eMJV (*elektronisch milieujaarverslag*) – electronic annual environmental report. The data in this monitor is taken from these eMJVs. As a result, no data is known about the companies that are not subject to licensing, which therefore cannot be included in the monitor. Read more about this in Annex 3.

1.3 Reading guide

This Environmental Monitor contains the results for the year 2018. Chapter 2 contains general and logistical data of the Moerdijk port and industrial park. The subsequent chapters (3 to 8) discuss and present the most important conclusions about the situation in 2018 for each environmental theme. In addition, where relevant, the 2018 results are compared to the policy objectives. A comparison is also made with previous years: is there a trend? The environmental themes also include any actions or projects planned that focus on policy objectives. Chapter 9 shows the number of complaints received by the environmental department in 2018 and their categorization. The report wraps up with the conclusion in Chapter 10.

The annexes contain the data collected and used, with explanations where necessary. This data serves as 'technical' background information for environmental themes.

2. MOERDIJK PORT AND INDUSTRIAL PARK

The port of Moerdijk is the fourth seaport of the Netherlands. The area is strategically located on the Hollands Diep estuary and river and has a surface area of 2,635 hectares. The site is divided into five sub-zones (see Figure 2-1). Similar companies establish themselves as close to each other as possible (business clustering) in order to make optimal use of each other and to strengthen each other where possible.

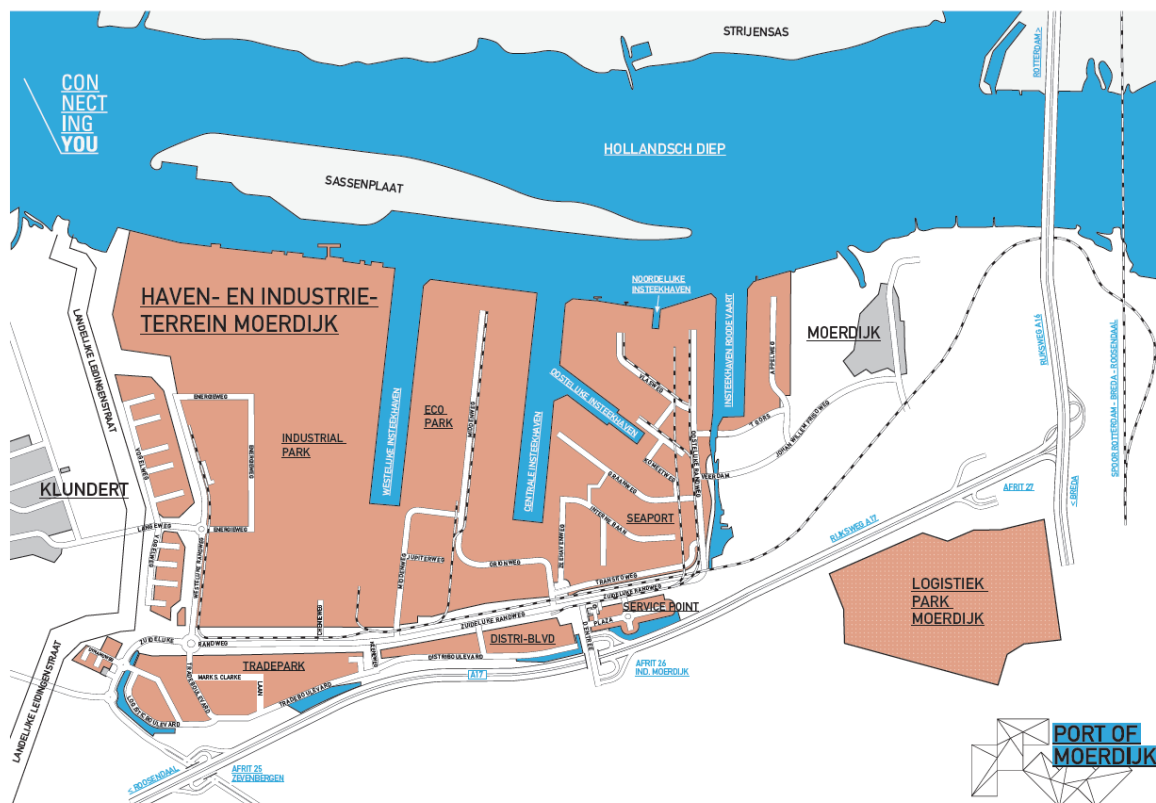


Figure 2-1. Overview of the Moerdijk port and industrial park with division into sub-zones, including the planned Moerdijk Logistics Park ('Logistiek Park Moerdijk'; source: Moerdijk Port Authority).

The Moerdijk Port Authority is the managing and operational organization of the Moerdijk port and industrial park. Together with other authorities and companies the Port Authority works towards a leading port and industrial park at Moerdijk in the field of sustainability and the environment. The Moerdijk 2030 Port Strategy endorses this. The realization of the Port Strategy is kept in balance by using the 'Triple P' principle of People, Planet and Profit as a starting point: sustainable development requires a balanced development process, aimed at promoting the resilience and quality of nature (Planet), the well-being of residents (People) and healthy economic development (Profit). An increase in economic development should not mean a deterioration in terms of nature and local residents. The Environmental Monitor makes this transparent.

The current zoning plan stipulates that heavier industry may be located on the Moerdijk port and industrial park. Several companies work with large quantities of hazardous substances and fall under the scope of the Major Accident Hazards Decree (BRZO see Figure 2-2.). This decree imposes requirements on the companies to prevent accidents with these hazardous substances. Permits are issued for these activities and supervision and possible enforcement is carried out.



Figure 2-2. Locations of BRZO companies on the Moerdijk port and industrial park, situation 2018 (source: www.risicokaart.nl).

In addition to water, rail and road transport, there is also an underground pipeline network between the ports of Moerdijk, Rotterdam and Antwerp. It was built more than forty years ago to strengthen the connection between these ports and industrial areas using underground transport. This sustainable method of transport contributes to the economic development of the region and the health and safety of the living environment. Management of the pipeline network is carried out by Leidingenstraat Nederland (LSNed).

The 2018 figures:

- In 2018, the Moerdijk Port Authority issued 10 hectares of available land for setting up or expanding businesses. For comparison: in 2017 more than 7 hectares were issued (see Figure 2-3).
- In 2018, 440 companies were established on the Moerdijk port and industrial park, representing 9,566 direct jobs. Including indirect employment, this adds up to 18,316 jobs, an increase of almost 2% versus 2017.
- More ships docked at Moerdijk in 2018 than in 2017: a total of 2,136 seagoing vessels and 12,183 inland vessels. Total cargo throughput (mainly dry bulk goods and other bulk) decreased by 2% to 18,161,000 tons. The share of seagoing shipping increased slightly in 2018 versus 2017 (2%), while inland shipping showed a decrease of around 5%. This decrease was mainly caused by the fact that fewer containers were transported on inland waterways. This is most likely due to the low river water levels over a large part of 2018, as a result of which ships suffered minimal draught levels and thus had to carry less cargo.
- In 2018, 40,356 rail cars were used to transport 1,316,000 tons of products to the port and industrial park. In terms of freight (tonnage), this means a decrease of more than 7% versus 2017.

There were more trains in 2018, mainly caused by more loads/rail cars from players in wet bulk and short-sea containers. The most important goods transported by rail to and from the Moerdijk port and industrial park are consumer goods, steel products and chemical products.

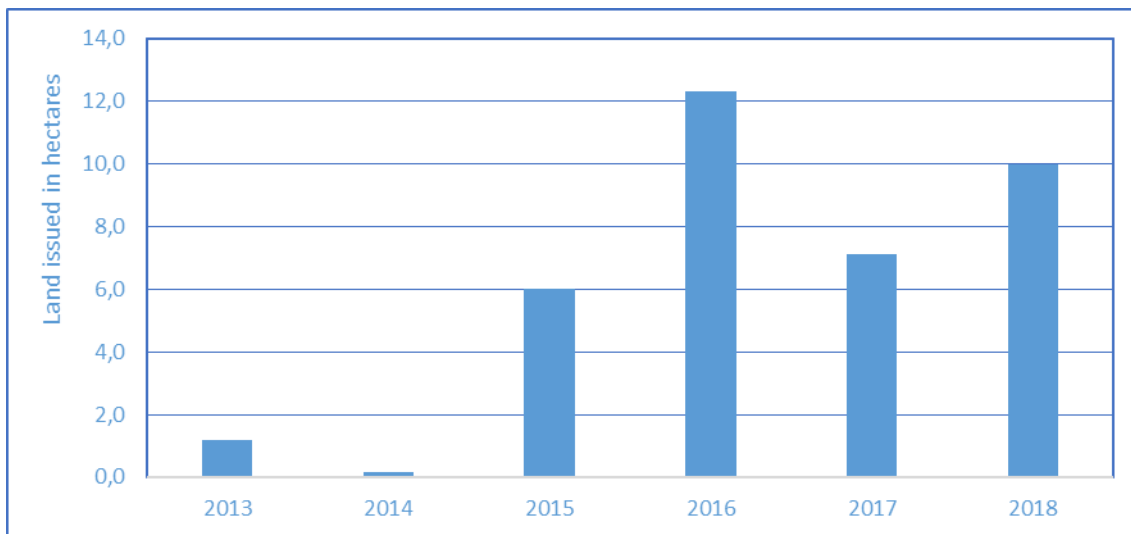
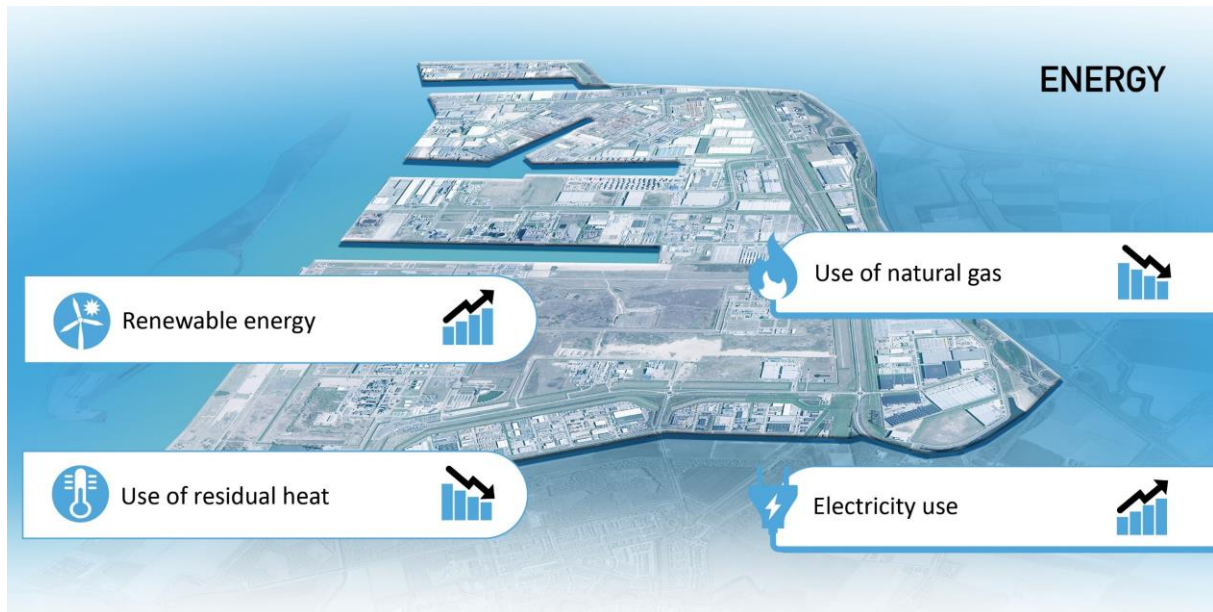


Figure 2-3. Land issued for the establishment and expansion of companies at the Moerdijk port and industrial park (source: Moerdijk Port Authority, 2018 Annual Report)

3. ENERGY

'More sustainably produced energy, less use of natural gas'



3.1 Where are we now?

In 2018, 440 companies were established at the Moerdijk port and industrial park. Together, these companies purchased and generated considerably more electricity than in 2017 (more than 55%).

This is partly explained by an increase in production and activity, and partly by a switch from gas as a source of energy to electricity. These changes in the use of sources of energy are related to (national) policy and social developments in the field of energy supply. One of the consequences of this is that companies become more self-sufficient in their own energy needs and make use of renewable energy sources. The use of oil as a source of energy also decreased in 2018 versus 2017. This continues the trend of previous years.

The 2018 figures:

- The use of natural gas decreased by 37% in 2018 versus 2017. This reduction is related to the closure of a gas-fired power plant, an increase in the purchase of electricity and the increase in renewable energy generation by the companies on the Moerdijk port and industrial park (see Figure 3.1).
- The use of residual heat¹ fell by almost 100% in 2018 versus 2017 (see Figure 3.1). This decrease can be explained by the closure of a power plant to which heat was supplied. The heat that was no longer supplied to the power plant in 2018 then qualified as self-generated renewable energy. The concept of residual heat no longer applies because in this case it is no longer a 'residual' product.
- The amount of self-generated renewable electricity increased to almost 645 thousand MWh in 2018 (see Figure 3-2). One of the reasons for this increase is that a company no longer supplied residual heat but used that heat to generate its own renewable energy (so it was no longer regarded as a 'residual' product). Additionally, various companies at the Moerdijk port and industrial park have built solar installations to (partly) meet their own energy needs. As a result, the share of self-generated renewable energy in total renewable electricity consumption is almost 35%. The increasing trend in the use of renewable, locally generated energy therefore continues.

¹ Use of '(residual) heat' as a source of energy relates to the exchange of residual heat at individual companies and between companies at the port and industrial park. The energy from heat is expressed in terrajoules (TJ).

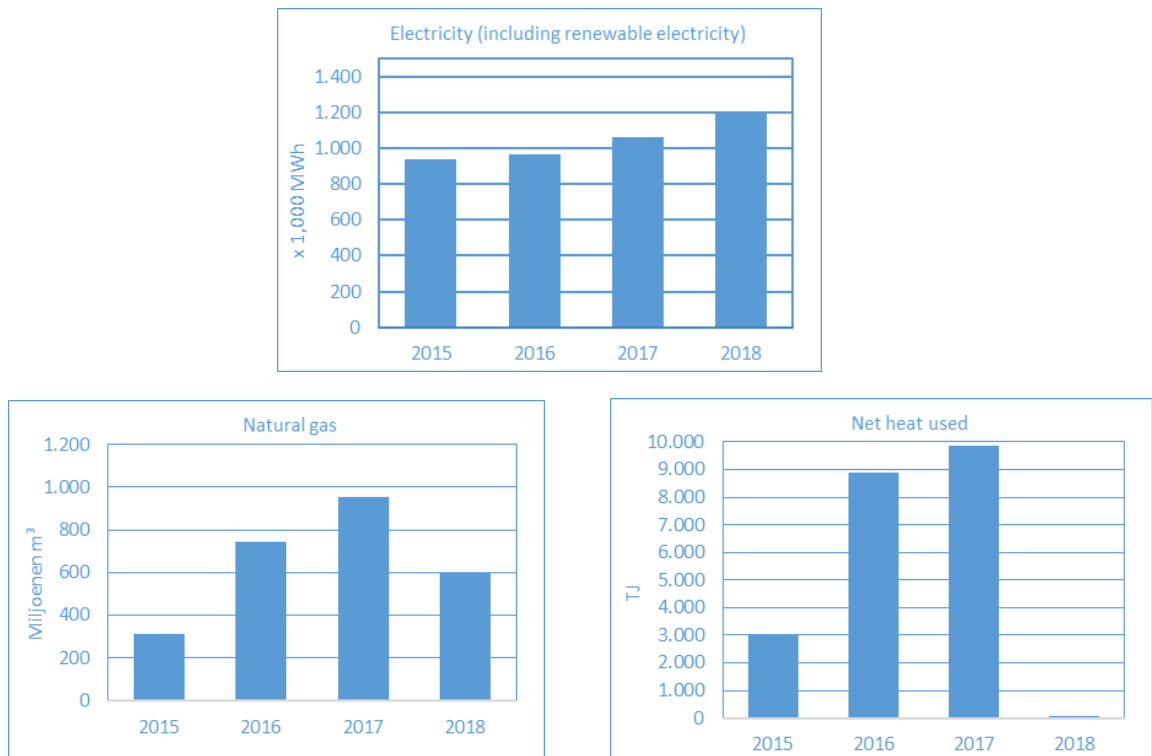


Figure 3-1. Energy purchased by companies in Moerdijk.

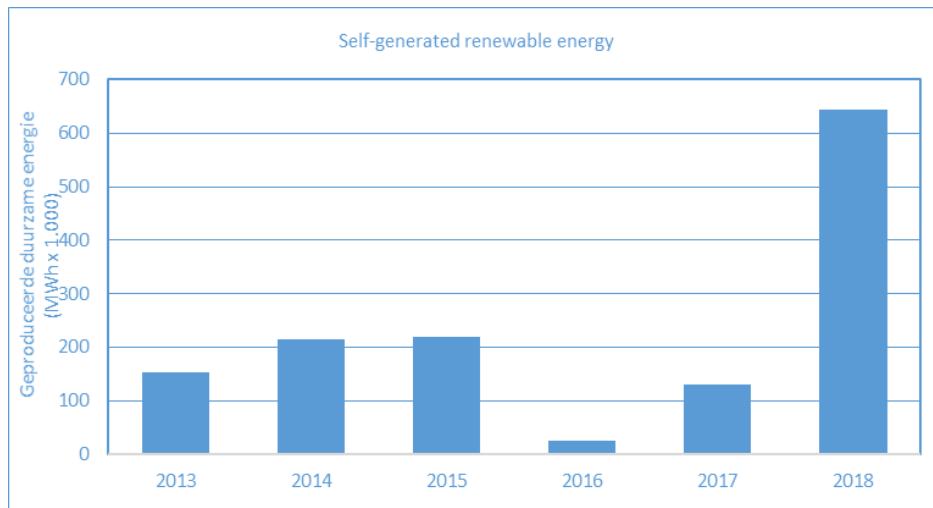


Figure 3-2. Self-generated renewable energy by eMJV companies at the Moerdijk port and industrial park.

3.2 What do we want to achieve?

The Port Strategy states that, regardless of oil prices, authorities and companies strive for sustainability and CO₂ reductions throughout the entire chain. The ambition is to reduce the energy consumption and environmental impact of both industry and transport, and to develop the port and industrial park into an energy-neutral port and industrial complex by 2030. This means that all energy comes from our own energy generation, without the use of fossil fuels, or that all energy is purchased sustainably. We are also putting a huge amount of effort into reducing the use of energy sources such as natural gas and oil. The intention is to make as much use as possible of the (residual) energy available at the port and industrial park. Additionally, the aim is to make more use of energy from wind, sun and biomass.

3.3 What did we do in this regard in 2018?

LED lighting

In 2017, the Port Authority carried out a test with LED lighting. The experiences and results were positive. For this reason, the Port Authority decided to replace the public lighting on the entire site in phases, and this was followed up in 2018. The Port Authority has now equipped both the central area and the access roads with adjustable and controllable LED lighting. This innovative solution for public lighting has generated a lot of positive publicity for the port and industrial park, in both specialized media and local media. Over the coming years, the lighting in the remaining part of the port and industrial park will be replaced in phases. There are no figures available yet on the savings this has yielded for 2018.

Solar energy

Several companies have solar panels at the port and industrial park. In this way, these companies are making an important contribution to corporate social responsibility. Additionally, this enables companies to meet a significant part of their own energy needs.

Several companies have taken action to increase the share of renewable energy by making use of subsidies for solar panels on company roofs using the Sustainable Energy Production Stimulus (SDE grant). Some companies installed solar panels in 2018, in some cases involving large areas. Shell has prepared for the construction of a large solar park on their site (to be completed in 2019). This will be one of the largest solar arrays in the Netherlands.

The launch of the Moerdijk Energy Program, intended for 2018, did not take place, as it has been rendered obsolete by the current climate agreement. The focus of the Energy Program, which was almost exclusively on green energy, has therefore shifted to CO₂ reduction specifically. For the most important CO₂ producing companies, we have mapped out the CO₂ emissions. The Port Authority also encouraged all industrial companies in Moerdijk to contribute to the Rotterdam-Moerdijk round table on the climate. The input provided is part of the climate agreement, in which the 'industry' sector makes further agreements at the national level.

3.4 What are we going to do in the coming period?

Solar energy

Solar energy is a way to contribute quickly and visibly to the energy transition at the Moerdijk port and industrial park (Planet) and to implement good neighborliness (People). The various options for ground-level systems have been tackled efficiently using a single approach, called Moerdijk Solar Park. Preparations for the construction of solar systems on the site (including the pipeline network) started in 2018. Several companies are also preparing the construction of solar parks.

Wind energy

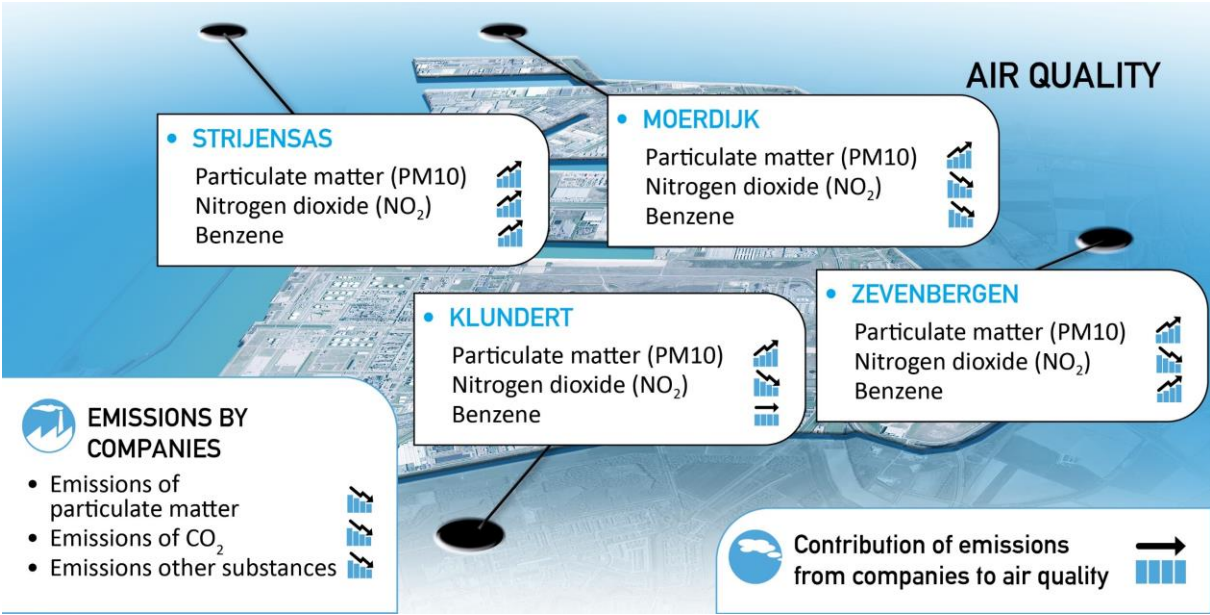
The Memorandum on Wind Energy in the Moerdijk Municipality 2013-2030 (adopted on 16 January 2014) contains an evaluation of the realization of wind energy based on the 2004 Vision on Wind Energy Bill and sets out a new vision. The memorandum also formulates preconditions for the various locations. The municipal ambition is to generate 30% of total energy needs from wind by 2030. This equates to approximately 85 MW of installed capacity by 2030. The memorandum also includes the search locations for wind energy. In 2017, the Moerdijk municipal council adopted the zoning plan, which will enable the construction of seven wind turbines on the west and south sides of the port and industrial park. Construction of these wind turbines will start in 2019.

EnergyWebXL

EnergyWebXL aims to supply residual heat and CO₂ from the port and industrial park to users on its own site and beyond. In 2017, the residual heat link with the Nieuw Prinsenland glasshouse horticultural complex and Suiker Unie's site in Dinteloord was investigated further. Various parties (including the provincial authorities and Enpuls) have investigated various scenarios in a consortium with heat producers and heat users and worked out the business case for the most promising scenarios in 2018. It will have become clear by autumn 2019 whether the business case is conclusive, and with which parties. A go/no-go decision on the start of the engineering phase is envisaged in late 2019. In the case of a go, heat supply will commence in mid-2021.

4 EMISSIONS AND AIR QUALITY

'Share of air quality to the locality unchanged, CO₂ emissions decrease'



As commissioned by the Province of North Brabant, air quality in the vicinity of the port and industrial park is measured. Air monitoring stations are situated in Moerdijk (set up in 2008), Klundert, Zevenbergen (both set up in 2013), and Strijensas ZH (set up in 2015). These air monitoring stations measure PM₁₀ (particulate matter), nitrogen dioxide (NO₂), and benzene. Figure 4-1 shows the locations of the air monitoring stations.

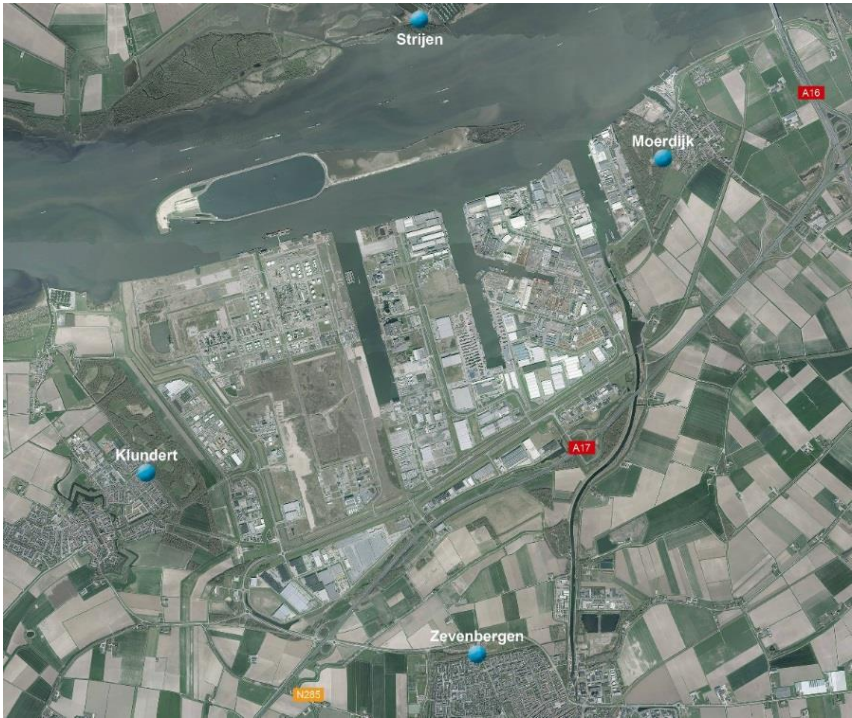


Figure 4-1. Locations of air monitoring stations near the Moerdijk Port and Industrial Park

The monitoring stations were set up to monitor long-term air quality. Based on the air quality measurements, the impact of activities at the port and industrial park on the surrounding villages was mapped out. The stations measure hourly average concentrations of various substances. The results of these air measurements are included in Annex 3.

4.1 Where are we now?

Figure 4-2 shows the annual average concentrations of particulate matter (PM₁₀), nitrogen dioxide (NO₂) and benzene of the four monitoring stations. The applicable EU standard for NO₂ and particulate matter (PM₁₀) is 40 µg/m³ and for benzene 5 µg/m³. None of these standards were exceeded in 2018 at any of the sites. In addition to EU air quality standards, the WHO (World Health Organization) has also set standards for air quality. For particulate matter, this is 20 µg/m³, for NO₂ this is 40 µg/m³ (so the same) and for benzene, an annual average of 0.17 µg/m³ is recommended. These values are not obtained at every monitoring station.

The annual average concentrations of particulate matter (PM₁₀), NO₂ and benzene in 2018 remained almost the same as in 2017. For benzene, there is a downward trend over the years 2015-2018. At the Strijensas monitoring station, an increase in the concentration of particulate matter (PM₁₀) and NO₂ can be seen versus 2017. The values are approximately at the level of 2016. Because the Strijensas station has only been operational for three years, it is difficult to determine whether this is a trend. Future results should clarify this.



Figure 4-2. Annual average concentrations of particulate matter (PM₁₀), nitrogen dioxide (NO₂) and benzene at the air monitoring stations in Moerdijk, Klundert, Zevenbergen and Strijensas.

Emissions by companies

Data on emissions by companies is included in Annex 3. CO₂ and NO_x emissions by companies fell in 2018. CO₂ emissions in 2018 were below 5 million tons – a 16% reduction versus 2017. One of the reasons for this is a reduction in CO₂ emissions at an energy company, one of whose power plants were shut down in early 2018. Additionally, seven other companies reduced their CO₂ emissions in 2018. Conversely, there are also four companies with a small increase in CO₂ emissions versus 2017.

For NO_x, the decrease in emissions versus 2017 was almost 17%, which can also be explained by the closure of the power plant. For SO₂, emissions are comparable to those of previous years, but they are slowly increasing, following the same

trend as previous years. For methane and ethylene, there is a slight decrease versus 2017. The emissions for these substances are comparable to those of the period 2012-2014.

For particulate matter (PM₁₀) there was a considerable increase in 2016 compared to previous years. In 2018, the emissions of particulate matter (PM₁₀) fell further versus 2017 but were still slightly higher than in 2015. For particulate matter (PM₁₀) it should be noted that many companies have only reported emissions of ‘total airborne particles’. Particulate matter represents only the fraction of airborne particles of 10 µg or smaller. Where companies have reported particulate matter (PM₁₀) separately, this data was used. Where they only reported total airborne particles, this value was used for particulate matter (PM₁₀). The actual emissions of particulate matter (PM₁₀) may therefore be lower than shown here. Incidentally, this applies to all years, not just 2018².

In recent years, ammonia emissions have also been reported in the Environmental Monitor. However, there have been zero ammonia emissions for the third year in a row. It was therefore decided to no longer include them in the report. If the ammonia emissions will be recorded in the coming years, they will be included in the report.

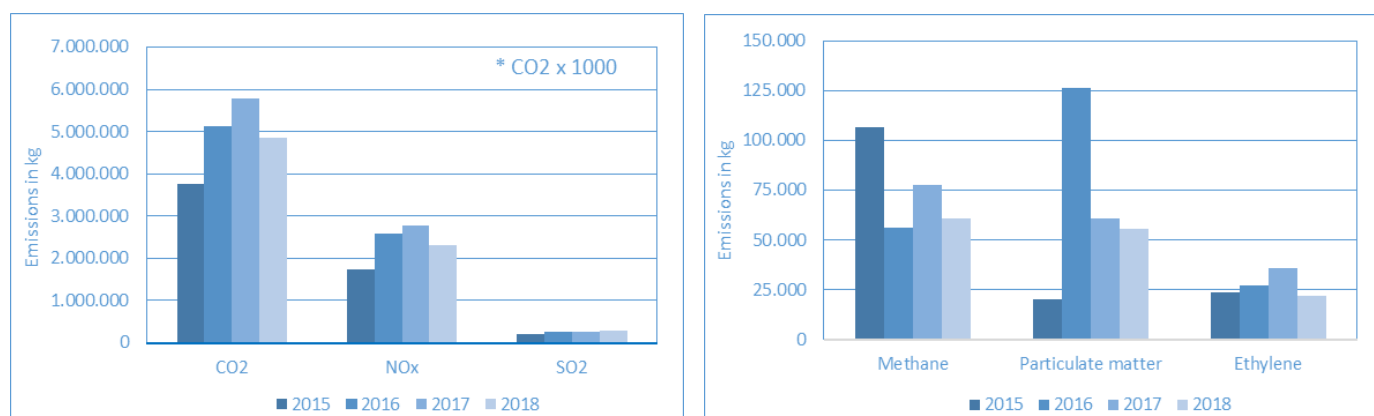


Figure 4-3. Emissions by eMJV companies of CO₂, NO_x, SO₂, methane, particulate matter (PM₁₀) and ethylene in kg.

Contribution of the Moerdijk port and industrial park to air quality

The annual contribution of the port and industrial park to the amount of particulate matter (PM₁₀), nitrogen dioxide, and benzene in the surrounding residential areas is calculated using a model. These calculations are based on the wind conditions and air quality measurements at the four monitoring stations mentioned above. Figure 4-4 shows the results.

The port and industrial park's share of particulate matter (PM₁₀) concentrations in the four surrounding residential areas remained virtually unchanged in 2018 versus 2017 and varies between 2.5 and 0.4 µg/m³.

The port and industrial park's contributions of NO₂ and benzene concentrations in the residential areas of Zevenbergen and Klundert were the same or higher in 2018 than in 2017. In Strijensas, the port and industrial park's contribution to benzene declined sharply. In terms of the nitrogen dioxide (NO₂) measured in the village of Moerdijk, the port and industrial park's share in 2018 was about 11%. This is a considerable increase versus the previous year (in 2017 this was 5%). When looking at the multi-year trend, it is particularly striking that 2017 had a very low percentage. In Klundert, the share was about 7%, and in Zevenbergen about 5%. In Strijensas, the share was about 10%. The changes in 2018 versus other years can be explained by meteorological conditions.

² This is the method used in the reports until 2016. In the report for 2017, a slightly different method was used. For the current report for 2018, we have returned to the method as used until 2016, because it gives the best indication of the particulate matter present.

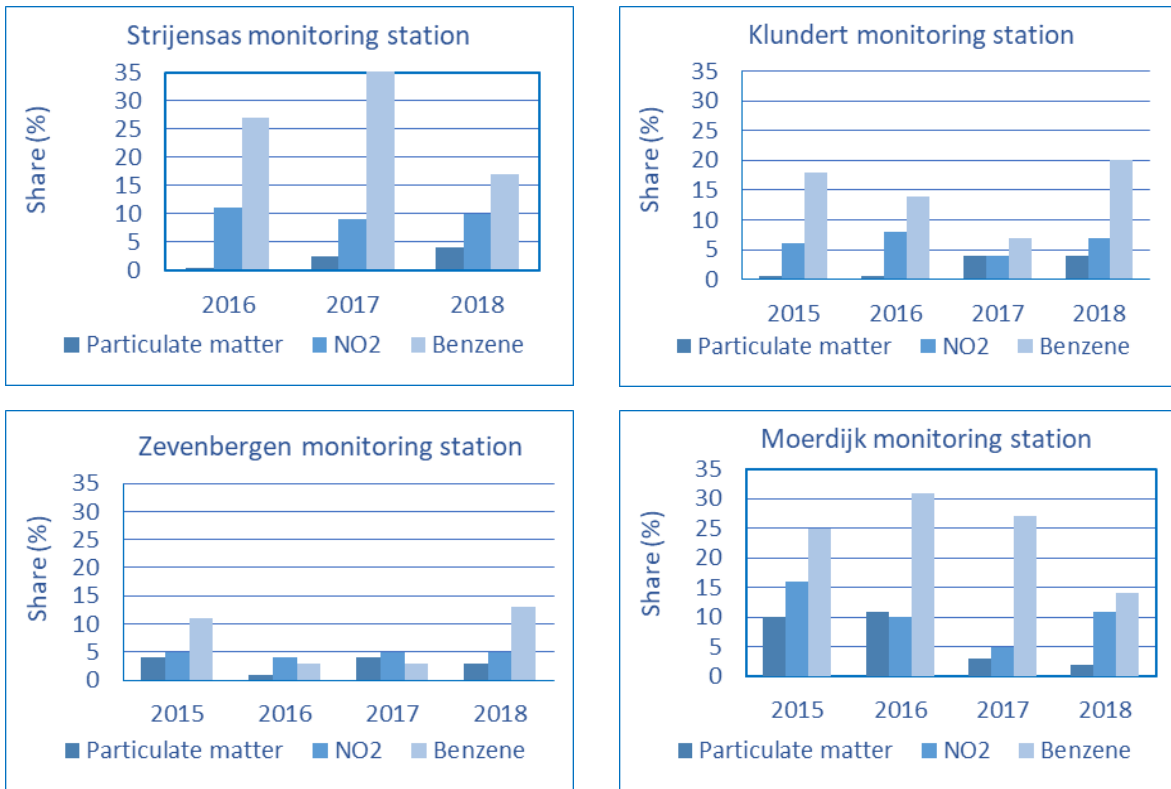


Figure 4-4. The Moerdijk port and industrial park's share in air quality at the air monitoring stations in Moerdijk, Klundert, Zevenbergen and Strijensas

In 2018, the share of benzene air concentrations attributable to the port and industrial park was 20% and 13% respectively in Klundert and Zevenbergen. In Moerdijk and Strijensas the contributions were 14% and 17% respectively and thus were lower. This is as was expected, given the prevailing wind direction. This is also suggested by research conducted by the Environment Agency (OMWB) on behalf of the Province of North Brabant. In this study, a 'wind rose analysis' was used to assess the extent to which the air quality in the residential areas around the port and industrial park can be explained on the basis of wind directions.

Figure 4-5 shows the wind rose for 2018. In 2018 the wind was predominantly southwesterly (190-250°), but it blew northeasterly (10-70°) for quite some time too. Moerdijk monitoring station is loaded by the Moerdijk port and industrial park in case of wind directions between 200° and 290°. Klundert monitoring station is loaded between 0° and 140°. Zevenbergen monitoring station is loaded by the industrial park between 280° and 20° and the Strijensas monitoring station between 120° and 230°.

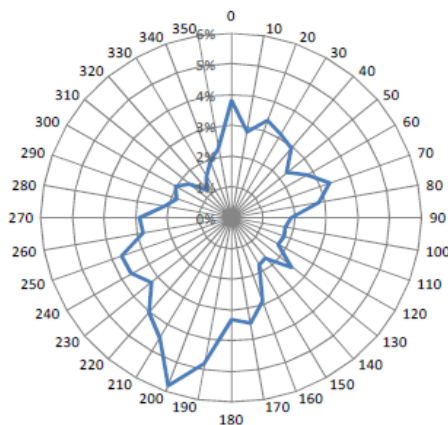


Figure 4-5. Wind frequency rose for wind directions at KNMI Gilze-Rijen monitoring station in 2017 (source: Central & West Brabant Environment Agency, 2018. Air emission report. The wind rose analyses into the impact of Moerdijk industrial park on air quality in Moerdijk, Zevenbergen, Klundert and Strijensas in 2017).

The measurement data also show that Moerdijk village has had a higher NO₂ load in all wind directions for many years (compared to the other residential areas). This is most likely due to the traffic on the A16 and A17 highways.

4.2 What do we want to achieve?

The economic development of the port and industrial complex cannot and must not come at the expense of the safety – and therefore livability – of the locality.

Ensuring a safe and healthy living environment demands environmental requirements that are both transparent and stringent. For example, particulate matter (PM₁₀), NO_x and CO₂ emissions must remain within the stipulated preconditions. That reflects the ambition as expressed in the section on air quality of the Port Strategy. It also states that businesses and local residents have to play an active role in consultations on setting and enforcing standards. Environmental quality (and its enforcement) is explicitly a joint responsibility. For the village of Moerdijk, the Port Strategy explicitly states that ‘maintaining the current environmental burden as a ceiling’ is the basis. This also applies to air quality. Air quality must therefore not deteriorate as a result of the expansion of industrial activities at the Moerdijk port and industrial park.

4.3 What did we do in this regard in 2018?

eNose network at Moerdijk port and industrial park

A total of 26 eNoses (see Figure 4-6) were installed in and around the Moerdijk port and industrial park from 2013 onwards. These serve as an early warning system, to achieve faster detection of the sources of odors and related complaints.

In 2017, the province of North Brabant, the municipalities of Moerdijk and Strijen, the Moerdijk Port Authority, the Central and West Brabant Safety Region, Shell, ATM, Attero and CNC decided to continue the eNose network around the Moerdijk port and industrial park. The 26 eNoses in and around the port and industrial park will continue to do their work for at least another two years (for more information on eNoses, see Annex 1).



Figure 4-6. An ‘eNose’ on a lamppost at the Moerdijk port and industrial park.

The so-called ‘sniffing poles’ measure relative changes in air composition and help to determine the origin of released substances. They do not measure per company, so the signals are indicative. When a specific concentration of a certain

substance in the air is exceeded, the relevant authorities receive an automated alert. So odor nuisance can be tackled as early as possible. The number of complaints and eNose alerts has fallen sharply in recent years. Presumably, this is the result of careful operational management by companies on the site. The eNose network will be continued until 2020. An evaluation will take place in 2019.

In 2016, a coordinated approach was adopted by companies and authorities to ensure that emissions of Volatile Organic Compounds (VOCs) by companies at the Moerdijk industrial park are kept to a minimum. To this end, in 2017 and 2018 a dozen companies at Moerdijk were investigated for emissions. These investigations revealed that some companies at the Moerdijk port and industrial park are emitting VOCs, mainly short-lived or smaller emissions of VOCs. New sources of benzene have not been demonstrated.

One company at the Moerdijk port and industrial park have a degassing installation for ships, which was used by 435 ships in 2018.

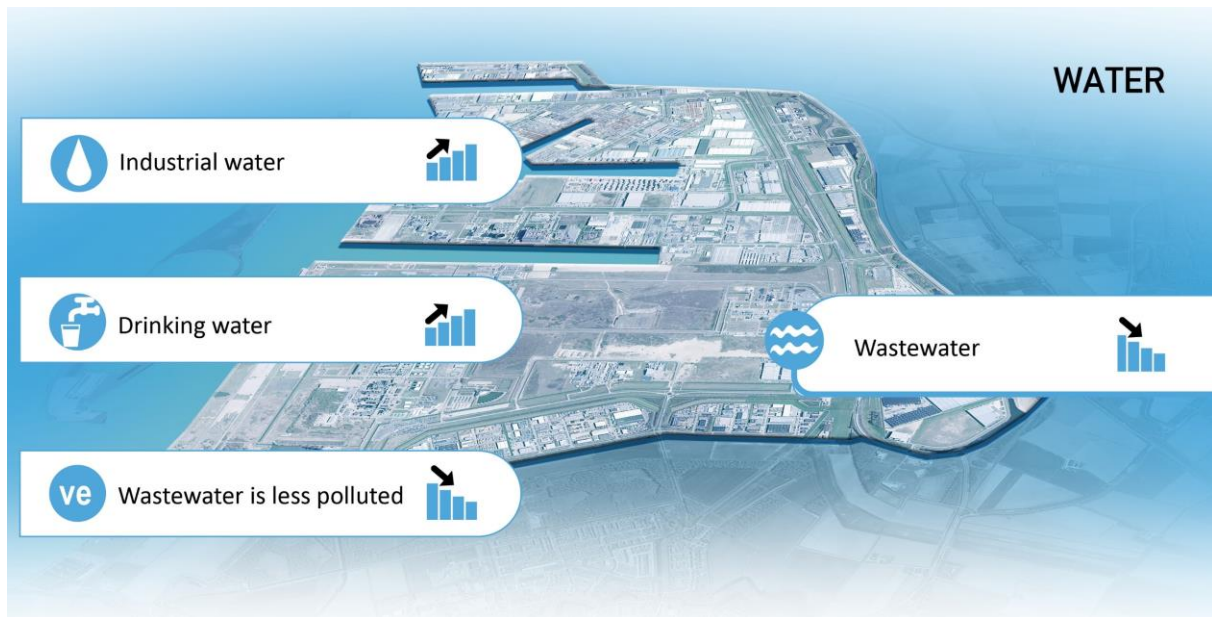
4.4 What are we going to do in the coming period?

For ships on Hollands Diep, the Provincial Environmental Regulation includes a ban on degassing benzene and benzene-containing substances while underway. An enforcement plan for ship degassing while underway is currently being developed. There will be a national degassing ban for inland tankers. Minister Van Nieuwenhuizen (Ministry of Infrastructure and Water Management) wants the international agreements for this to be in place in the Netherlands by mid-2020. Implementation begins with a ban on degassing:

- of motor fuels and benzene in 2020,
- followed by a ban on liquids containing more than 10% benzene in 2022,
- and finally, in 2023, a ban on the 25 most transported hazardous substances.

5 WATER

'Increased industrial and drinking water consumption'



5.1 Where are we now?

Use of drinking and industrial water

Brabant Water supplies two types of water to the Moerdijk port and industrial park: 'ordinary' drinking water and industrial water (via distributor HydroBusiness). This allows companies to choose the water quality that best suits their purpose. Industrial water is of a different quality than drinking water and can be used for business processes that are not related to human consumption, such as rinsing, cleaning and cooling.

The 2018 figures on water:

- In 2018, the companies at the port and industrial park consumed 1,238,239 m³ of *drinking water*. This is an increase of 28,791 m³ (2.4%) versus 2017. This drinking water consumption is comparable to the annual consumption of about 8,200 families in the Netherlands.
- At the same time, the consumption of *industrial water* increased by 188,000 m³ versus 2017. This ensures that total water supply (drinking and industrial water combined) in 2018 shows a further increase versus 2017 and 2016. In previous years, total water consumption decreased slightly. The slight increase in water use is in line with the trend for the whole of North Brabant and may be caused by the warm summer of 2018.
- In 2018, the use of industrial water increased by 3.5% and of drinking water by only 2.4%. This is in line with the expectation that Brabant Water had expressed the previous year that demand for industrial water at the Moerdijk port and industrial park would increase. This rise is partly due to an improving economy and the establishment of new customers, especially at the IPM. Brabant Water will direct its supply capacity accordingly. The aim is to make the supply of water more sustainable by using solar energy.

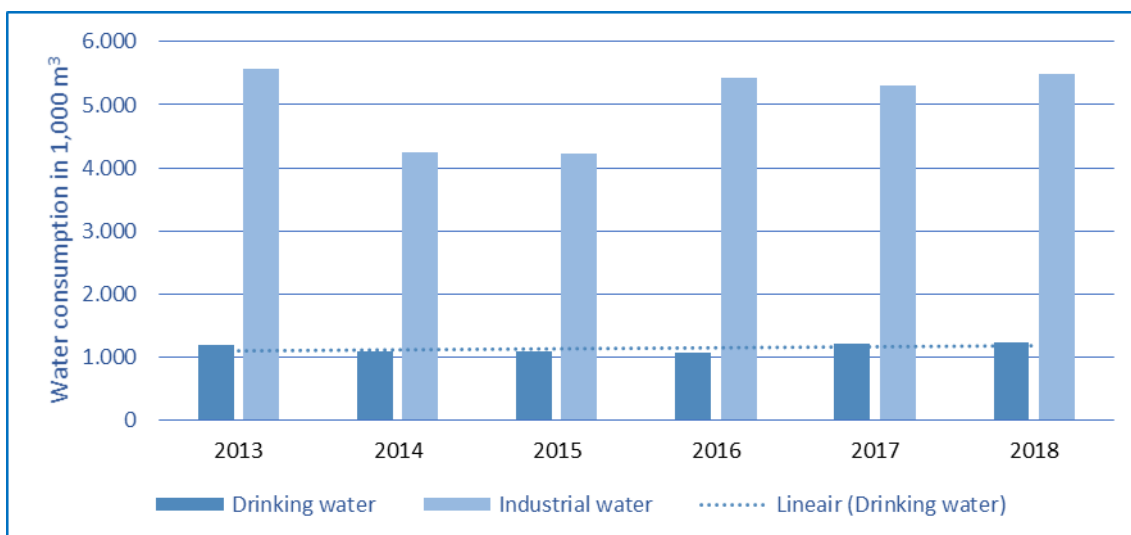


Figure 5-1. Use of drinking and industrial water at the Moerdijk port and industrial park in the years 2013-2018.

Discharge of wastewater

Companies on-site not only consume water but also discharge water. There are four types of water discharges by these companies:

1. indirect discharge of wastewater and precipitation into the *sewage system*;
2. direct extraction and discharge of *cooling water* on the Hollands Diep by a few companies, in addition to direct discharge of precipitation;
3. infiltration (into groundwater), including soil remediation;
4. water in (by)products, including water in sewage sludge.

(The last two types together only make a small contribution to the total amount of discharged water).

The 2018 figures:

- For wastewater, more than 5.7 million m³ of wastewater was discharged through the sewer system in 2018. This is a lower volume of water than discharged in 2017, caused by greater efficiency among the companies on site. The wastewater is discharged via the Waterboard Brabantse Delta wastewater pressure main to the sewage treatment plant in Bath. An overview of this pressurized sewage main and the work planned on it is included in Annex 2.
- In 2018, this wastewater had a total pollution value of 71,850 units of pollution. This is a small decrease of just over 1% compared to the previous year. This is also the lowest value since 2014 (see Table 5-1).

Table 5-1: Industrial and drinking water consumption and discharge at the Moerdijk port and industrial park between 2014 and 2018 in m³ and units of pollution (u.p.).

	Unit	2014	2015	2016	2017	2018
Drinking water	1,000 m ³ *1000	1,089	1,089	1,066	1,209	1,238
Industrial water	1,000 m ³ *1000	4,250	4,217	5,424	5,305	5,493
Wastewater discharged	1,000 m ³ *1000	5,953	5,861	6,369	6,346	5,768
Unit of pollution	1,000 u.p.	83	77	78	73	72

5.2 What do we want to achieve?

The 2030 Moerdijk Port Strategy includes the following ambition for a sustainable and future-proof water system:

“In terms of the water system, the coherence between the economic activities, safety aspects (such as protection against high water), and the ecological quality of the underlying landscape is emphatically present. The water system in and around Moerdijk is the connecting factor. In developing its ambitions, Moerdijk will also consider the effects and opportunities offered by this water system. On the one hand, this relates to the aspects that are directly linked to the ambitions of the Port Strategy, such as guaranteeing and where possible improving water quality, closing the (waste)water chain, sustainable water consumption, and the quantitative availability of clean water. On the other hand, it is about influencing larger government programs in the right direction (including the Waterpoort area tasking) concerning the downstream river area, estuarine dynamics and a climate-proof water system, in order to ensure that economic ambitions also remain in balance with the ‘planet values’ over the longer term.”

Other goals include:

- The objective to use water as a connecting factor between the port and industrial park and its locality. In addition to quantitative factors, qualitative factors are also relevant in managing all water flows with an eye to becoming more climate-proof.
- Making optimal use of the WWPM (Wastewater Pressure Main) and limiting existing supply, safeguards the development margin of the port and industrial park. In conjunction with this, the aim is to maximize the reuse of water flows.
- Large quantities of surface water are used as cooling water and then discharged. The aim is to reduce this amount of cooling water as much as is realistically possible.

The 2030 Moerdijk Water Management Plan (WMP) was completed in 2018. The WMP must lead to concrete measures for the sustainable use of (waste)water at and from the port and industrial park. Because of the growth ambitions for the port and industrial park, the WMP can provide the basis for a structural, integrated approach to water issues.

The WMP states that the water partners want to work towards a situation in 2030 in which the following objectives are met:

- A water-resilient and climate-adaptive design of the port and industrial park and its infrastructure can withstand flooding (surface water, precipitation) and water shortages due to e.g. drought (surface water, groundwater and industrial and drinking water). It can take a beating, has ‘resistance’ (does not react severely) and has ‘resilience’ (recovers quickly).
- Reducing emissions is about reducing polluted or unusable (water) flows. This is about reducing the passing on of a problem to the environment. Reduced emissions are not only necessary from a lower impact or burden on the environment (the ‘footprint’), but also to make good use of the available infrastructure and deploy it cost-efficiently.
- Less use of precious resources means a lower burden on the environment, so that water can be used with as much added value as possible. More economical use of water is part of this, as is the targeted use of resources.
- Making the best possible use of released water flows and targeted treatment contributes to lower emissions and less use of other water flows.

The higher goal is to create a vibrant region, where different functions (agriculture, nature, industry, ports, recreation, etc.) can develop side by side and in synergy with each other. The horizon for this is the year 2030.

The following is what the parties involved in the WMP want at that point in time:

- Spatial planning and business processes are designed in such a way that companies can continue to function optimally, despite climate effects and fluctuations in the availability of water. This is ensured by responding to the opportunities and possibilities of the water system and water chain;
- The environment is taken into account as much as possible and rainwater that is released is used as far as possible (locally) (look more closely at the possibilities and opportunities of the water system and water chain);
- Optimal use is made of sustainable sources; and released water is re-used.

5.3 What did we do in this regard in 2018?

The Moerdijk port and industrial park Water Management Plan was completed in 2018 as a joint product of all parties that play a role in the (waste)water chain and the water system. In late 2017/early 2018, research was carried out into the extent to which the substance GenX occurs in West Brabant and/or is a problem. For this purpose, the presence of the

substance GenX was investigated in four surface waters and at four wastewater treatment plants managed by the Waterboard Brabantse Delta. Significant concentrations of GenX were only found in the influent and effluent of the Bath WWTP (wastewater treatment plant). Research subsequently focused on the supply to the Bath WWTP. This research demonstrated that waste processing in the waterboard management area is the largest source of PFAS compounds (which includes PFOS, PFOA and GenX) at the Bath WWTP. There may be other sources, but these have not yet been investigated further, because ±98% of the PFAS compounds found in the influent from Bath originate from waste processing. Various measures have been taken that have greatly reduced the discharge of GenX.

The lack of clarity as to how waste processors could better fulfill their duty of care has resulted in further consultation between the parties involved. They have been busy setting up an action perspective for waste processors and permit issuers in relation to the presence of 'Substances of Very High Concern' (*zeer zorgwekkende stoffen*, or ZVS) in waste products.

Substances of Very High Concern

Substances of Very High Concern (ZVS) are the most hazardous substances for humans and the environment. For this group of substances, a policy objective has been set to keep them out of the living environment. The approach to keep ZVS out of the living environment includes prevention and reduction and the assessment of residual discharge to achieve the Environmental Quality Requirement (*Milieukwaliteitseis*, or MKE) for water. This approach is an interaction between Source Approach, Minimization and Continuous Improvement. This continues the path towards reducing ZVS levels in wastewater discharges in a feasible and affordable way and to gradually work towards the lowest possible concentration of these substances in the surface water. Continuous improvement maintains pressure on the goal to gradually lower ZVS levels. Also, agreements are being made at an international level on measures such as substitution, a ban on production, authorization, or restrictions on use for certain applications. To identify ZVS substances, the 'toxic load in water' [*waterbezwaarlijkheid*] is determined using the General Assessment Method (*Algemene Beoordelingsmethodiek*, or ABM). This tool contains a list of ZVS substances. GenX is a substance on the list of ZVS substances.

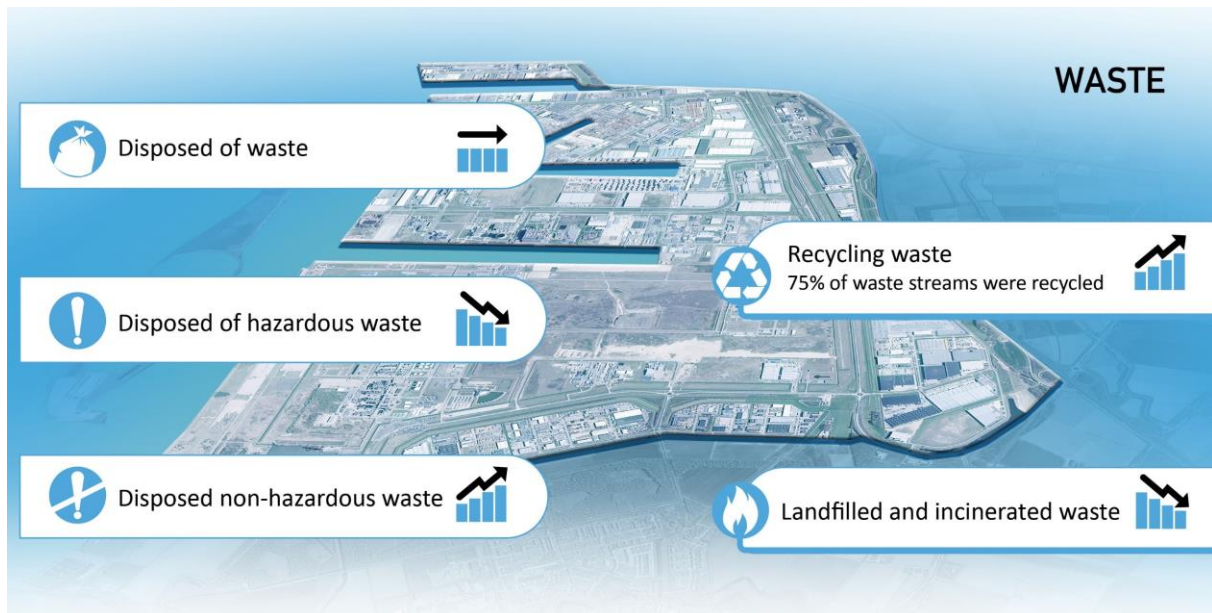
5.4 What are we going to do in the coming period?

Concerning the substances of Very High Concern, a more in-depth investigation may be carried out into the origin of the remaining GenX found in the Bath wastewater treatment plant. Examples include (automobile) fuel tank cleaners, which are indirect dischargers, that all discharge into the Bath WWTP.

Also, a plan of action for the Water Management Plan will be drawn up in 2019. In this document, the stakeholders involved will jointly define the actions to be taken for the years 2019 to 2021. The various parties can then integrate this into their programs.

6 WASTE

'Increase in waste recycling, decrease in hazardous waste disposal'



6.1 Where are we now?

In 2018, the amount of waste generated by the eMJV companies at the Moerdijk port and industrial park amounted to more than 3.8 million tons (a decrease of 11% versus 2017). Some of this waste is transported elsewhere for processing, but part of it is processed at the port and industrial park.

The 2018 figures:

- In 2018, 78% of waste flows were recovered (recycling and energy recovery), representing an increase of 6% versus 2017. The proportion of waste that was incinerated remained almost the same.
- The amount of waste to landfill decreased by 81% versus 2017 (see Figure 6-1). One explanation for this is that the total amount of waste processed also decreased in 2018.
- Compared to 2017, the relative share of waste to landfill decreased by 10% in 2018. The data shows that this share has been shifted to recycling and waste separation.
- In 2018, the companies on site disposed of a total of more than 2.3 million tons of waste (see Figure 6-2). This is almost the same as in 2017. The ratio between hazardous and non-hazardous waste changed in 2018: the share of hazardous waste was only 15% in 2018, versus 36% in 2017.
- The companies on the Moerdijk port and industrial park disposed of a total of 359,000 tons of hazardous waste in 2018. This is a decrease of 58% versus 2017. The decrease can be traced back to three companies in particular. For the other companies there is a small increase or decrease in the amount of hazardous waste disposed of.
- Of the hazardous waste, 33% was transported abroad and 67% was transported elsewhere in the Netherlands. In previous years, more waste was transported abroad in percentage terms.
- The volume of non-hazardous waste in 2018 increased versus the previous year to 2 million tons (37% increase).

Waste processing

Depending on the nature of the waste, waste processing – either on site or at a waste disposal site – takes place in different ways. Processing methods are shown in Figure 6-1. Nearly 75% of all waste will be recycled in 2018, which is an increase in the relative share of ‘recycling’ (+5%). The same can be seen for energy recovery (+1%) and waste separation (+4.5%). The amount of recycled waste shows a decrease versus 2017, which can be explained by the decrease in the total amount of waste processed. There is a decrease in the percentage of waste that is incinerated and sent to landfill. Specifically, the volume of waste sent to landfill has decreased significantly.

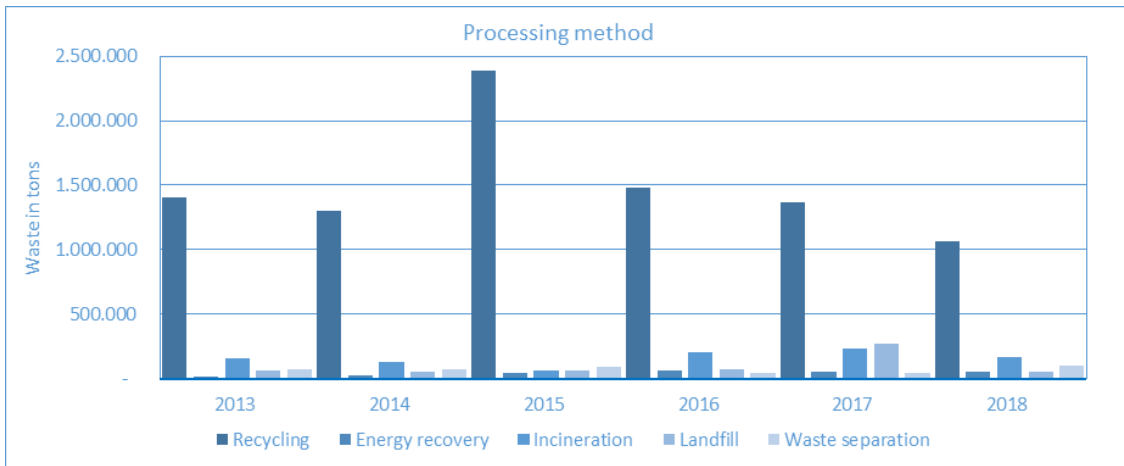


Figure 6-1. Overview of waste processing by type

Waste disposal

Part of the waste produced and disposed of is processed and recovered (see above), but the processing method is not known for all of it. This explains the difference between the total amount of waste disposed of (see Figure 6-2) and the quantities mentioned for processing methods (see Figure 6-1).

A distinction is made between hazardous and non-hazardous waste (risks to human health and the environment). Figure 6-2 provides an overview of the distribution of the waste disposed in the years 2013-2018. This shows that the total amount of waste removed has stagnated compared to the increase of the previous two years. In 2018, the ratio between hazardous and non-hazardous waste changed significantly, reducing the share of hazardous waste to 15% versus 36% in 2017. As a result, the share of waste has been transported elsewhere in the Netherlands as well as abroad. Most of the hazardous waste was disposed of elsewhere in the Netherlands in 2018 (67%).

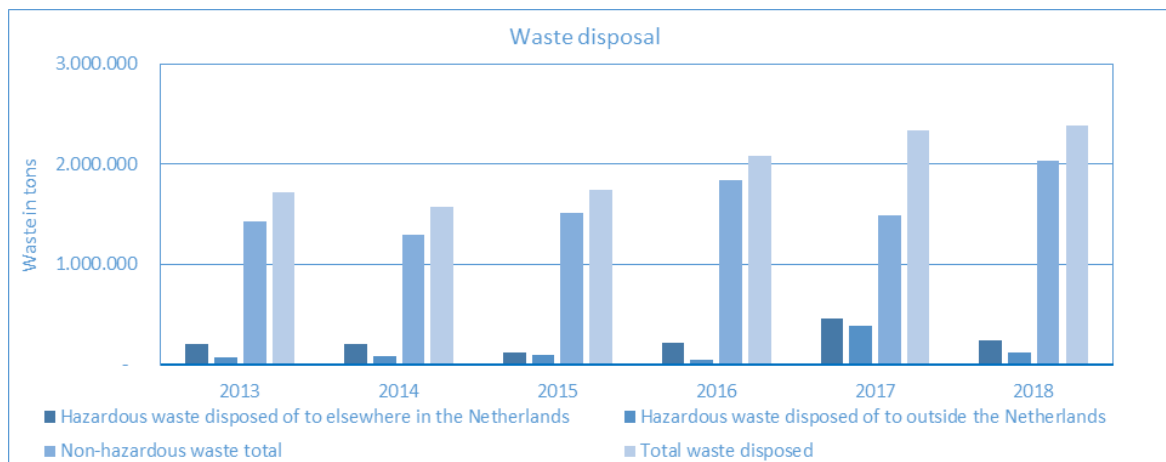


Figure 6-2. Volume of hazardous and non-hazardous waste disposed.

6.2 What do we want to achieve?

The Port Authority and the Municipality of Moerdijk have not set any specific ambitions or objectives for dealing with different types of waste but have joined the National Waste Management Plan (*Landelijk Afvalbeheerplan*, or LAP). This plan includes three objectives for waste policy:

1. limiting the generation of waste
2. reducing the environmental impact of 'waste management' activity
3. limiting the environmental impact of product chains (raw material extraction, production, use and waste management, including recycling) from a chain-specific perspective.

6.3 What did we do in this regard in 2018?

Companies exchange raw materials, energy, and residual flows. Waste or (residual) products from one company serve as raw material or auxiliary material for another, nearby company. There are different exchanges between companies. For example, CO₂ is filtered from combustion gases and then used to make pigment for the paper industry. Steam released by domestic waste incineration is also used to generate electricity.

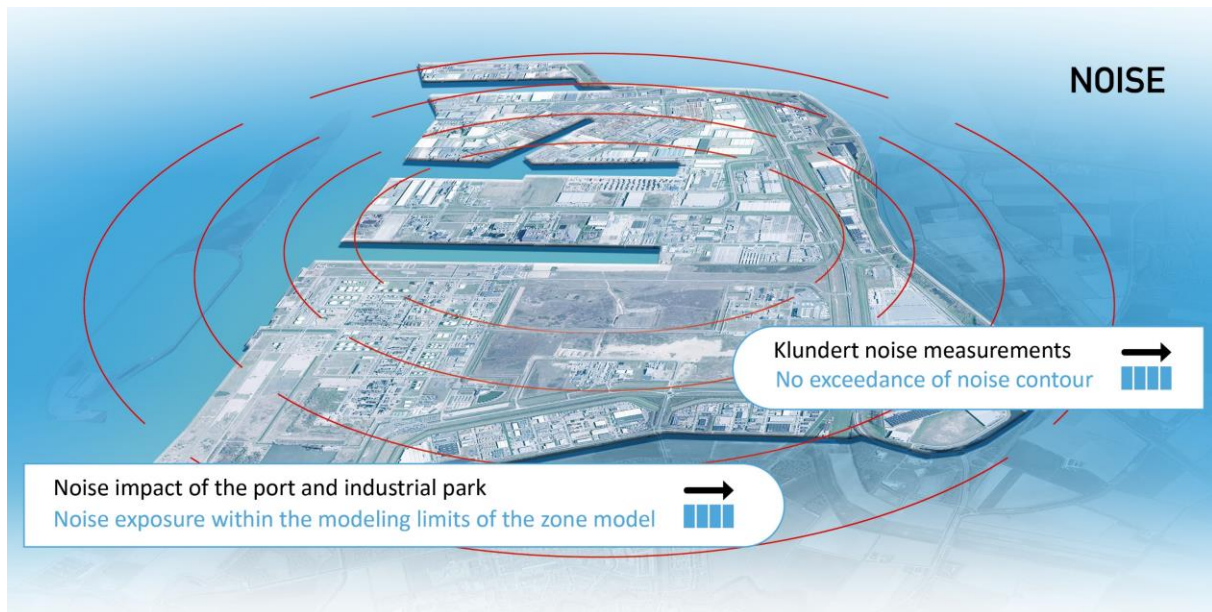
6.4 What are we going to do in the coming period?

In line with the 2030 Moerdijk Port Strategy and the sustainability ambitions, the parties involved are stimulating the reuse of waste flows. They do this by identifying opportunities and sharing successes. Companies mainly work on this among themselves.

Within the Moerdijk port and industrial park, the parties involved are working on a growing network of sustainable connections. This contributes to the desired transition to the 'circular economy'. This is an economic system that maximizes the re-usability of products and raw materials and minimizes value destruction. The principles of 'reduce, re-use and recycle' are taking on more and more concrete proportions in Moerdijk. As a result, companies are realizing savings on production costs, increasing their share of renewable energy, and reducing their CO₂ footprint.

7 NOISE

'Noise levels have remained within the set standards for years'



7.1 Where are we now?

The establishment of 'Major Sources of Noise'³ is permitted on the Moerdijk port and industrial park. To prevent nuisance to the surrounding area, a noise zone has been established around the site within the framework of the Noise Abatement Act. The province of North Brabant is the competent authority for monitoring this noise zone within the framework of licensing.

When granting permits to the companies at the port and industrial park under the Environmental Permitting (General Provisions) Act (Wabo), the limit values of the noise zone must be observed. These limits do not apply to each company, but the port and industrial park. In other words, when granting individual licenses to one company, the other companies must also be taken into account. To ensure this is done in an effective and efficient way, a 'noise accounting' system has been set up for the port and industrial park. This is called zone management or zone monitoring.

The noise impact of the port and industrial park may not exceed a statutory contour: a maximum of 50 decibels (dB(A)) of noise may be produced outside that contour. When referring in legal terms to a 50 dB(A) sound contour, this relates to a 24-hour value. This value is translated into three periods: the day, evening, and night periods, with a correction for the evening (minus 5, so 45 dB(A)) and night (minus 10, so 40 dB(A)).

To monitor the noise impact, a so-called zone monitoring model has been drawn up. The model includes the licensed noise emissions of the various companies. This zone monitoring model is used to calculate the noise load of all companies together at the edge of the noise zone. The most recent version of the zone monitoring model shows that the relevant limit values are not exceeded at any location. In 2018, the noise level from the Moerdijk port and industrial park to the surrounding area was within the permitted limit of 50 dB(A).

³ The companies mentioned in article 2.1. of the Environmental Law Decree (formerly Article 2.4. of the Establishments and Licenses Decree for Environmental Management) are considered as 'Major Sources of Noise'.

Klundert noise measurements

The municipality of Moerdijk commissioned the noise impact of the Moerdijk port and industrial park to be determined at Klundert for a period of two years (2017-2018) from 12 January 2017 utilizing measurements (the previous two years measurements were carried out at the village of Moerdijk). Noise measurements were carried out using the permanent monitoring station on the eastern edge of the Klundert residential area (at the air quality monitoring station, see Chapter 4). The results of these measurements were reported by the Environment Agency (OMWB).

The point where the noise measurements are carried out is located just outside the sound contour of 50 dB(A). Because of the zoning decree, the noise level at this point may therefore not exceed 50 dB(A). Based on the zone monitoring model, it can be stated that the (permitted) noise load is 48 dB(A). This means that there is theoretically about a 2 dB(A) noise margin in the direction of the Klundert residential area. The noise measurements at Klundert show that there is a noise margin of approx. 3 dB(A) based on the actual noise impact. There is therefore no measurable excess concerning the calculated noise impact based on the zone monitoring model. As a result, noise levels met the statutory requirements in 2018. In 2017, the results of noise measurements at the village of Klundert showed a similar picture.

7.2 What do we want to achieve?

For the port and industrial park, there is a zone outside of which noise levels may not exceed 50 dB(A). The permissible noise impact is shown in contours (see Figure 7-1). The ambitions for the port and industrial park, as expressed in the Port Strategy, must be realized with the currently available noise margins within the noise zone. This requires tight control of the available noise margins.

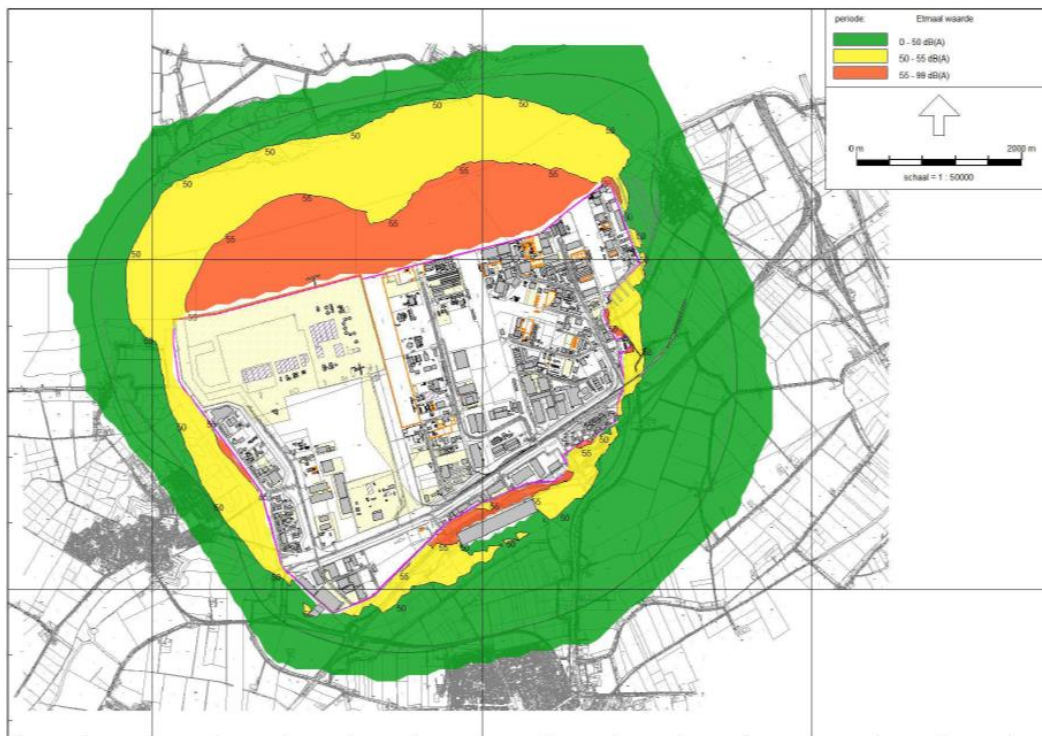


Figure 7-1. Noise contours around the Moerdijk port and industrial park in the 2018 situation (source: Province of North Brabant, 2018. Zone management in North Brabant – Moerdijk Industrial Park in Moerdijk).

7.3 What did we do in this regard in 2018?

If the ambition for growth as set out in Moerdijk's '2030 Moerdijk Port Strategy' is realized, then in the absence of better means of controlling noise, the current noise margins are expected to be insufficient. A better management system for noise production and distribution of any available noise margin should make it possible to grow within the existing noise contour of 50 dB(A).

In 2015, a Noise Vision for the Moerdijk port and industrial park was drawn up for this purpose, in line with the expected developments and growth ambitions, as included in the '2030 Moerdijk Port Strategy'. It mentions several possible

measures, which will be investigated further (in correlation and otherwise). In 2016, the first step was to draw up a 'Noise Integration Plan'. This was continued in 2019.

As indicated earlier, noise measurements were carried out at the village of Moerdijk until the end of 2016. This was commissioned by the municipality of Moerdijk, near the permanent air monitoring station at Julianastraat in Moerdijk. Subsequently, as of 12 January 2017, noise emissions from the Moerdijk industrial park were established at Klundert for a period of two years (2017-2018) (see 7.1). The reason for carrying out the measurements was the complaints about noise nuisance caused by the activities at the Moerdijk port and industrial park. These noise measurements were carried out until the end of 2018 and there is no follow-up.

7.4 What are we going to do in the coming period?

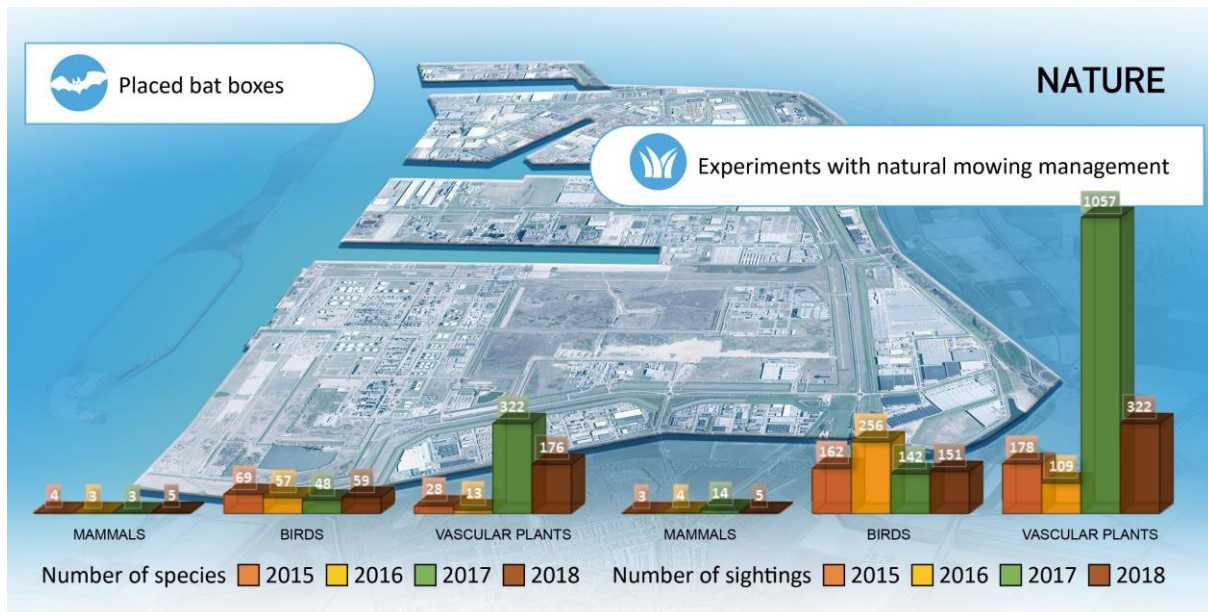
The coming years will focus on measures to enable growth in activity at the port and industrial park, while preventing extra noise pollution to the surrounding area. Any measures in the 'Noise Integration Plan' (yet to be drawn up at the time of writing) will determine the possibilities for preventing additional noise pollution. An interval of two years is applied for recalibration of possible measures. This not only continuously accounts for changing legislation and regulations, but also factors in possible changing expectations in the noise impact from the port and industrial park.

Another important change that will take place in 2019 on the theme of sound is the transfer of enforcement for the noise zone. This is currently done by the province of North Brabant, but from 2019 the municipality of Moerdijk will take over enforcement.

Concerning further elaboration of the integration plan, discussions will be held with other zone managers and several (legal) possibilities will be investigated further. The aim of the noise integration plan is allotment of the noise to maintain sufficient sound margins for the plots of land yet to be issued. This requires an adaptation of the zoning plan. The technical part of the plan was completed in the first half of 2018. This shows that implementation of such a plan will indeed have the desired result. After consultation with several Moerdijk companies within the noise working group on the reallocation of existing noise margins, it was decided to carry out a thorough check on existing permits. By adapting existing permits to the actual use situation, the noise integration plan may not be necessary. This check will be carried out in 2019.

8 NATURE

'Bat boxes fitted and successful experiment with natural mowing management'



8.1 Where are we now?

The Moerdijk Port Authority invests in nature in a variety of ways, including green buffer zones, butterfly zones and ecological mowing management. Various companies also contribute to the objectives of nature.

Figures for 2018:

- In 2018, 259 animal and plant species were found on the port and industrial park (see Table 8-1 and Figure 8-1). No sightings of amphibians and fish were recorded in 2018. This does not mean that these groups of species are not present.
- The largest swallow colony of West Brabant now resides in Moerdijk, thanks to the construction of earthen ramparts on company lots within the framework of Temporary Nature.

Table 8-1: Observations of flora and fauna at the port and industrial park in the years 2015-2018 (source: National Flora and Fauna Database).

Species group	Number of species				Number of sightings			
	2015	2016	2017	2018	2015	2016	2017	2018
Mammals	4	3	3	5	5	4	14	5
Birds	69	57	48	59	162	256	142	151
Amphibians	0				0			
Fish	0	1			0	1		
Butterflies	0		18	10	0		145	32
Dragonflies	0		9	3	0		20	3
Insects	0		9	6	0		33	11
Vascular plants	28	13	322	176	178	109	1057	332

The sightings of flora and fauna at the Moerdijk port and industrial park registered in 2018 were collected from the National Flora and Fauna Database (NDFD). Data has been entered into the NDFD by so-called 'source holders': SOVON (Dutch Centre for Field Ornithology), FLORON (Plant Conservation Netherlands), Waterboard Brabantse Delta, and various websites where individuals can log sightings, such as www.telmeel.nl, www.waarneming.nl. One point of attention when interpreting this data is that only reports submitted by organizations or individuals are included in the NDFD. So, this overview is not

necessarily complete. This is also evident in practice: there are several mammal species at the site, of which apparently no sightings have been recorded. However, the NDFD is the most accessible and reliable data source.



Figure 8-1. Sites of flora and fauna sightings in 2018 (source: NDFD).

8.2 What do we want to achieve?

The 2030 Moerdijk Port Strategy is based on the principles of People, Planet, and Profit. The idea behind this is that sustainable development requires a balanced development process, aimed at promoting for instance the resilience and quality of nature ('Planet'). The economic vitality of the port and industrial park benefits from measures and investments that safeguard the locality's natural value, among other things.

This gives nature a chance to develop at the Moerdijk port and industrial park. Growth of activity at the port and industrial park is linked to investments in nature and the locality. Companies invest in nature and thus earn scope for economic use. In 2015, a 'Nature Management Plan' was drawn up within this framework. This is an elaboration of the agreements made in the 'Green Deal' agreed in 2013 between the (former) Moerdijk Port Authority, the Municipality of Moerdijk, the Moerdijk Industrial Park Group of Businesses (BIM), Brabants Zeeuwse Employer Association, the Province of North Brabant, and the Netherlands Forestry Commission, Southern Region. It forms the basis for dealing with nature at the Moerdijk port and industrial park for the coming years.

The Nature Management Plan makes licensing procedures relating to nature simpler, faster, and sometimes even superfluous. Companies on site are also actively working towards developing nature, for example by constructing temporary nature on unused land.

As a follow-up to the 'Nature Management Plan', a 'Management Plan for Protected Species' has been drawn up. The outline of the 'Management Plan for Protected Species' acts as an example for other business parks in North Brabant that pursue sustainability, stimulate biodiversity and want to treat protected species with care. Additionally, the business climate is improved by reducing research costs and procedures.

The 'Management Plan for Protected Species' was adopted administratively in 2017. Based on this plan, the Environment Agency (OMWB) grants an exemption for a duration of 10 years. The plan provides for:

- A generic exemption for animal and plant species protected year-round. Based on this exemption, it will no longer be necessary to go through a separate permit process for each activity on the site.
- An exemption for the so-called 'temporary nature' – nature that develops on (temporarily) unused land. Initial reactions from companies and stakeholders to this concept were positive. This may eventually result in more hectares

of Temporary Nature, as companies with land at the Moerdijk port and industrial park are considering applying for Temporary Nature as well.

- Guidance for dealing carefully with protected species when carrying out management and maintenance work.

8.3 What did we do in this regard in 2018?

Natural mowing

In 2018, the Moerdijk Port Authority started experimenting with a more natural system of mowing and management of underground utilities at the Moerdijk port and industrial park. Unproductive areas and wide verges are mowed extensively (i.e. less) compared to the meter-wide strips and the sightlines at intersection angles. Some roadside areas even enter winter without being mowed. This provides a boost to biodiversity. Insects see an opportunity to hibernate and small mammals, such as mice and small marten-like animals (including weasels, polecats, and stoats), use the verges to forage. Weasels, for instance, have been captured on film at a camera trap. This ensures that the extensively managed verges also make good access roads to and from the plots of 'temporary nature' at the port and industrial park. The verges also form connections between the temporary nature and the main ecological structure around the port and industrial park. This makes the ecological system more robust.

In 2018, 25-30 pairs of skylarks, 3 pairs of oystercatchers, 3 pairs of lapwings, 1 pair of little ringed plovers, and a buzzard hatched on the temporary nature plots. Together with the military airbases in Brabant, the Moerdijk port and industrial park form an important stronghold for the skylark in North Brabant. Sand martins did not breed here in 2018. Due to the presence of a den of foxes, the sand martins migrated to a colony protected by electric fencing on an industrial site, the sand depot on Middenweg reserved for sand martins and the Hollands Diep dredging depot. The ponds dug on the temporary nature site turned out to be widely used by mammals (foxes, polecats, hares, rabbits, and roe deer) for drinking. Unfortunately, the pools dried up quickly due to the extreme heat in 2018, so the functions for any amphibians (frogs, salamanders and toads) quickly disappeared. In the winter, a short-eared owl and a group of partridges were observed on the temporary nature plots, and peregrine falcons can be seen all year round. Peregrine falcons breed in the specially constructed boxes at some companies on the port and industrial park.

Bat boxes

Together with the Moerdijk Polders working group of the Etten-Leur IVN (Institute for Nature Education), 40 bat boxes were put up in the Moerdijk Forestry Commission and the Moerdijk Port Authority in March 2018. These boxes are intended partly as a mitigating measure for the loss of some of the suitable dwelling places for bats on the temporary nature plots. By offering alternative dwelling places well in advance of the spatial interventions, the bats present in the area can explore them and use them as an alternative. At the Moerdijk port and industrial park, it is mainly migrating *Nathusius' pipistrelle* bats from countries to the north and east of the Netherlands that visit the Moerdijk port site in late summer and stay a few weeks. Male *Nathusius' pipistrelle* bats use the boxes and/or tree cavities, loose bark, or crevices in trees as a so-called sound box from which they call females to mate. Such dwellings are therefore called 'mating dwellings'.



After mating, the females and males leave Moerdijk in search of winter quarters in more southerly areas, before returning to Northern and Eastern Europe in spring. This is a cycle that repeats itself every year between all the activities at the Moerdijk port and industrial park.

8.4 What are we going to do in the coming period?

The 'Management Plan for Protected Species' identifies follow-up steps, namely the preparation of an Implementation Plan and a Communication Plan. For the purposes of the 'Management Plan for Protected Species', periodic monitoring of protected animal and plant species is probably necessary. The baseline created in 2016 and 2017 thus gets a follow-up. In any case, the development of Temporary Nature will be monitored in the coming years.

The 2030 Moerdijk Port Strategy indicates the following for other developments in terms of nature:

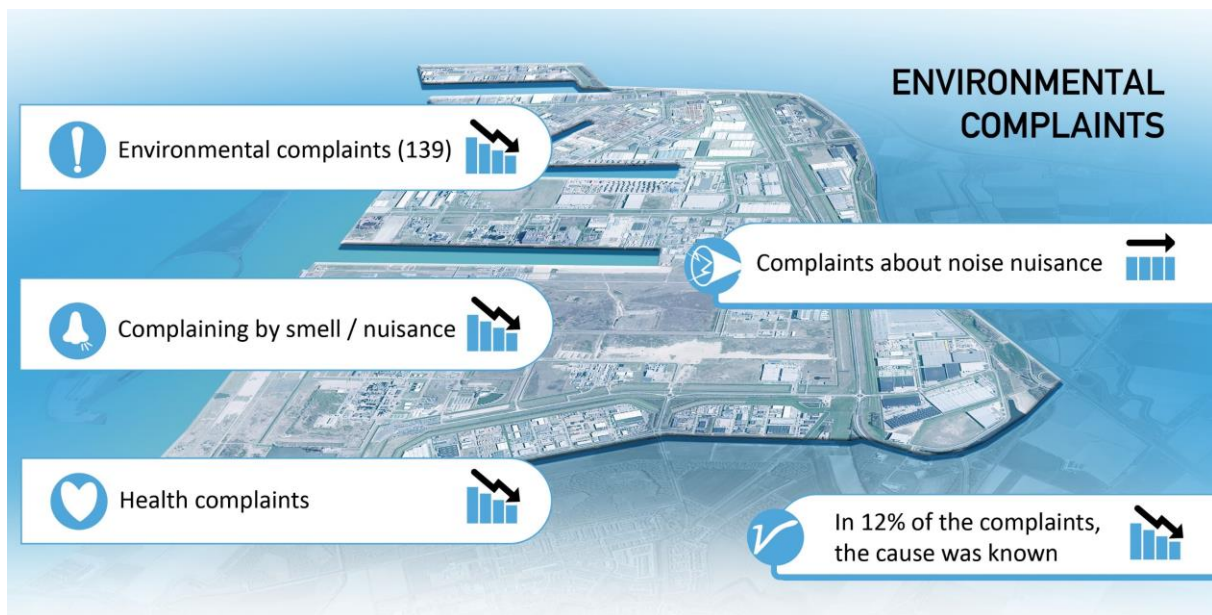
"Safeguarding the resilience of the realization of this requires new earning models and structural partnerships between the business community at Moerdijk, important nature organizations in the region, and the authorities involved. This could include, for example, investments of CO₂ compensation funds from companies on the port side in the locality, targeted sponsorship, and adoption of areas of nature and landscape. This could be stimulated by organizing work trips for related companies. This can be connected to the integral structural vision of the West Brabant region. (...) Where useful and necessary, new areas of nature could be developed with a supporting and leading function for the Biesbosch."

Medium-term projects that are considered include:

- Development of a cycling route between 'Industry and Nature';
- Development and implementation of a nitrogen management model;
- Natura2000 related measures, giving substance to statutory obligations;
- Realization of robust nature through additional measures on top of the Natura2000 related measures, creating extra scope for development. When these additional measures are implemented, the provincial authorities can use their powers to support requested additional scope for economic development by freely issuing development scope for the Moerdijk port and industrial park.

9 ENVIRONMENTAL COMPLAINTS

'Number of complaints decreased further in recent years'



9.1 Where are we now?

The municipality of Moerdijk and the province of North Brabant designated the Environment Agency (OMWB) as the single point of control for registering and handling environmental complaints and notifications from local residents in the area. The complaints survey relates to all complaints that are reported, both inside and outside the municipality of Moerdijk. These are complaints of which the presumed culprit is located on the Moerdijk industrial estate.

The 2018 figures:

- In 2018, 139 complaints related to the port and industrial park were reported, almost 14% less than the previous year. The downward trend in the number of complaints submitted, which started in 2015, continued in 2018.
- In 2018 there were two 'complaints clusters': a single day in which five or more complaints were received (see Figure 9-1); one more than in 2017. Of the 139 complaints reported, 17 (12%) qualify as part of a complaint cluster.
- Over 80% of all complaints in 2018 relate to air/odor ('I smell...'), see Figure 9-2 and text box. In terms of percentages, this is a decrease versus 2017.
- In 2018, the majority of the complaints about odor focused on chemically smelling air and oil.
- There were 10 complaints about noise nuisance ('I hear...') received in 2018; as many as in 2017.
- In 2018, 9 out of 139 complaints were also reported as health complaints (see Figure 9-3). This is a slight decrease versus 2017. In the period 2013-2018, there is a visible decrease in the proportion of complaints that also involve reported health problems.

For more information on registered complaints, please refer to the 'Annual Overview of Environmental Complaints in the Municipality of Moerdijk', which can be found on the website of the Municipality of Moerdijk.

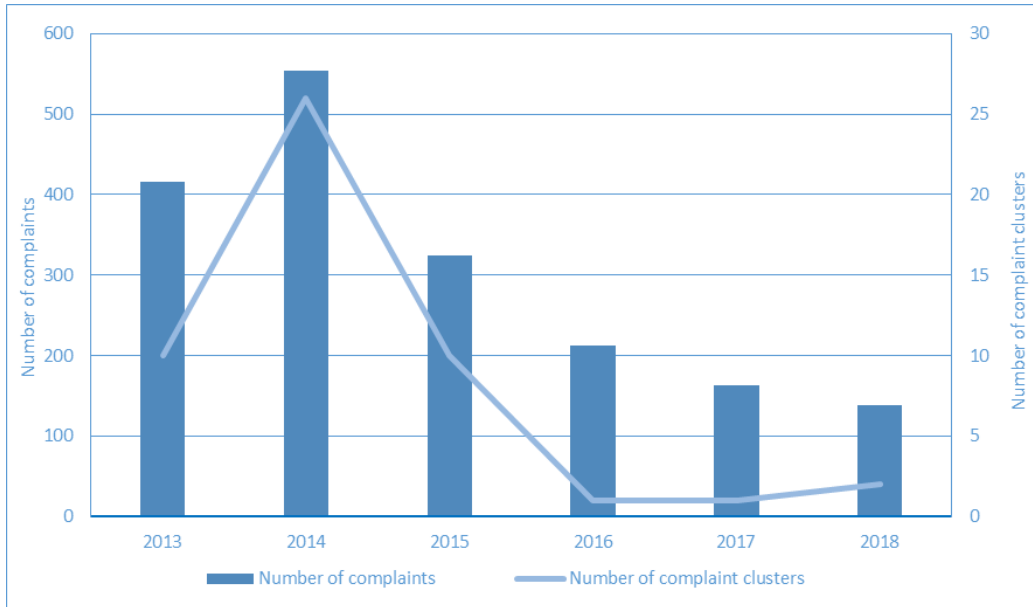


Figure 9-1. Number of complaints and complaint clusters that are related to the Moerdijk port and industrial park over the period 2013-2018.

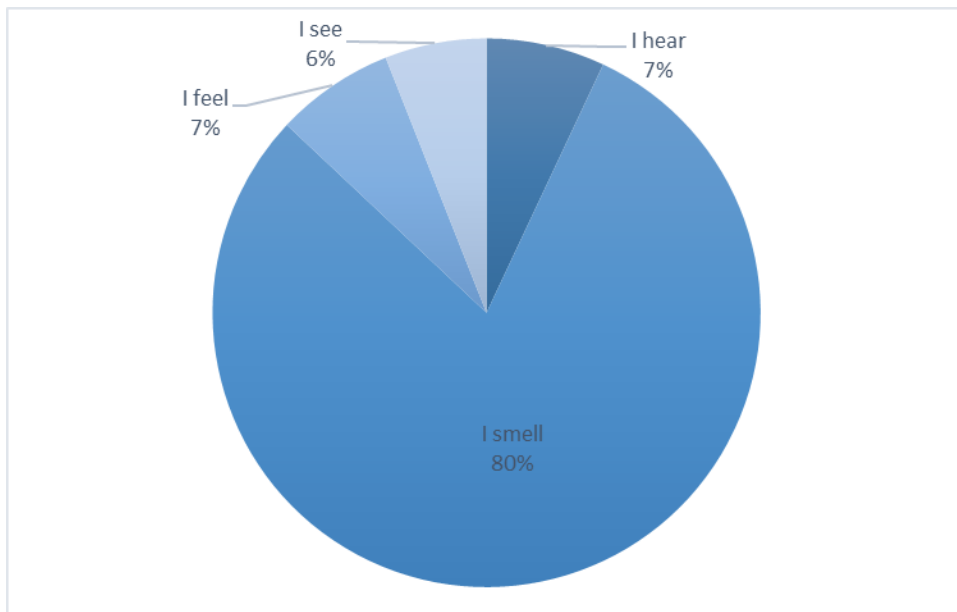


Figure 9-2. Categories of complaints related to the Moerdijk port and industrial park in 2018.

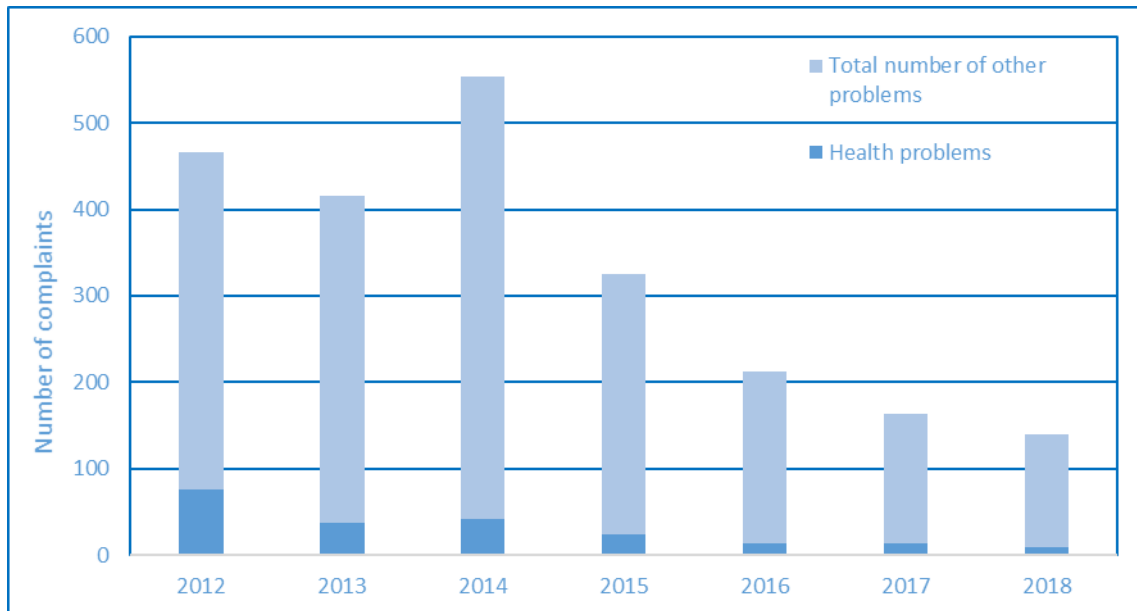


Figure 9-3. Development of number of complaints and health complaints over the years 2012-2018.

Sailing, degassing ships lead to odor nuisance. This does not involve benzene, but rather substances such as acrylates with a low odor threshold. There is a ban on benzene and not on other substances. Benzene is only perceptible at very high concentrations. The other substances being degassed are the ones that lead to nuisance. Some companies have made technical (metrological), organizational and logistical changes in recent years. These are partly aimed at limiting odor emissions and therefore the number of complaints. Given the decreasing trend in the number of environmental complaints and complaint clusters, these measures are likely to have a positive effect.

9.2 What do we want to achieve?

The economic development of the port and industrial complex cannot and must not come at the expense of the safety – and therefore livability – of the locality.

The aim is therefore to minimize the number of environmental complaints related to the Moerdijk port and industrial park. Additionally, the parties involved want to communicate openly and transparently about complaints and how they are handled.

9.3 What did we do in this regard in 2018?

The Environment Agency (OMWB) registers and handles the environmental complaints and notifications, insofar as the presumed culprit is located at the Moerdijk port and industrial park. In 2018, a new system was implemented for this purpose. The eNoses (electronic noses) help Environment Agency (OMWB) employees to track down sources. The OMWB reports quarterly on the environmental complaints and provides an annual report.

9.4 What are we going to do in the coming period?

We will continue to analyze complaints and registered incidents. There is close cooperation in this regard between the Port Authority, governing bodies, and the OMWB.

10 CONCLUSIONS

In 2018 the Moerdijk port and industrial park will have experienced various forms of economic growth: growth in the number of companies, growth in transshipment, and growth in employment. Despite this increase in activity, some aspects of the environmental performance have remained the same (noise, air, complaints). This perfectly reflects the ambition to allow the port and industrial park to grow, while at the same time ensuring the environmental burden does not increase. In terms of the theme's energy, water, and waste, we see slight increases. For energy, it is notable that the total consumption of energy has increased, but that the share of sustainably produced energy is rising even more sharply. This trend is also expected to continue in 2019. The results of the Moerdijk 2018 Environmental Monitor show that the companies on the port and industrial park are acting relating to sustainability and the environment. This is being done both in relation to (new) legislation and regulations and unilaterally.

Energy

In 2018, the amount of electricity purchased increased versus previous years. Natural gas was used less as a source of energy in 2018. As in previous years, in 2018, the use of oil as a source of energy was relatively low. Strikingly, there was a decrease in the use of residual heat. In 2018, this dropped to a low level in 2018 due to the decommissioning of a power plant from which the residual heat was taken.

Air

In 2018, the standards for particulate matter (PM₁₀), nitrogen dioxide (NO₂), and benzene were not exceeded at air monitoring stations in the residential areas of Moerdijk, Klundert, Zevenbergen, and Strijensas. The annual average concentrations of particulate matter (PM₁₀), NO₂, and benzene in 2018 remained almost the same as in 2017. As a result, air quality in the vicinity of the Moerdijk port and industrial park stabilized versus the previous year, despite growth in economic activity.

CO₂ emissions in 2018 were 16% lower than in 2017. NO_x emissions were 17% lower. This is due to the closure of a power plant at the Moerdijk port and industrial park.

Water

In 2018, more than 81% of the water used at the port and industrial park consisted of industrial water – water of a slightly lower quality than drinking water. This reverses the downward trend in the period 2012-2016. The reason for this is increasing production at companies on site. For wastewater, more than 5.7 million m³ of wastewater was discharged through the sewer system in 2018. This is a lower volume of water than discharged in 2017, due to greater efficiency among the companies on site. The wastewater pollution value continues the slight downward trend versus previous years. So less wastewater is produced, with a lower level of pollution.

Waste

In 2018, the companies disposed of a total of more than 2.3 million tons of waste, virtually the same as 2017. In 2018, there was a large decrease in the disposal of hazardous waste, especially to outside the Netherlands. The total volume of waste processed decreased by 27% versus the previous year. Moreover, in 2018, 78% of the waste flows were reused or recovered, representing an increase of 6% versus 2017. There also was an increase in waste separation. In addition, in 2018, less waste was incinerated and taken to landfill.

Noise

As in previous years, in 2018, noise levels in the locality of the Moerdijk port and industrial park remained within the limits of the 50 dB(A) noise contour, based on the zone monitoring model. Additionally, to check the model-based calculations, in 2018 noise measurements were carried out at Klundert by the Environment Agency (OMWB). These measurements confirm that noise levels remain within the limits of the stipulated noise contour, with a noise margin of approximately 3 dB(A).

Nature

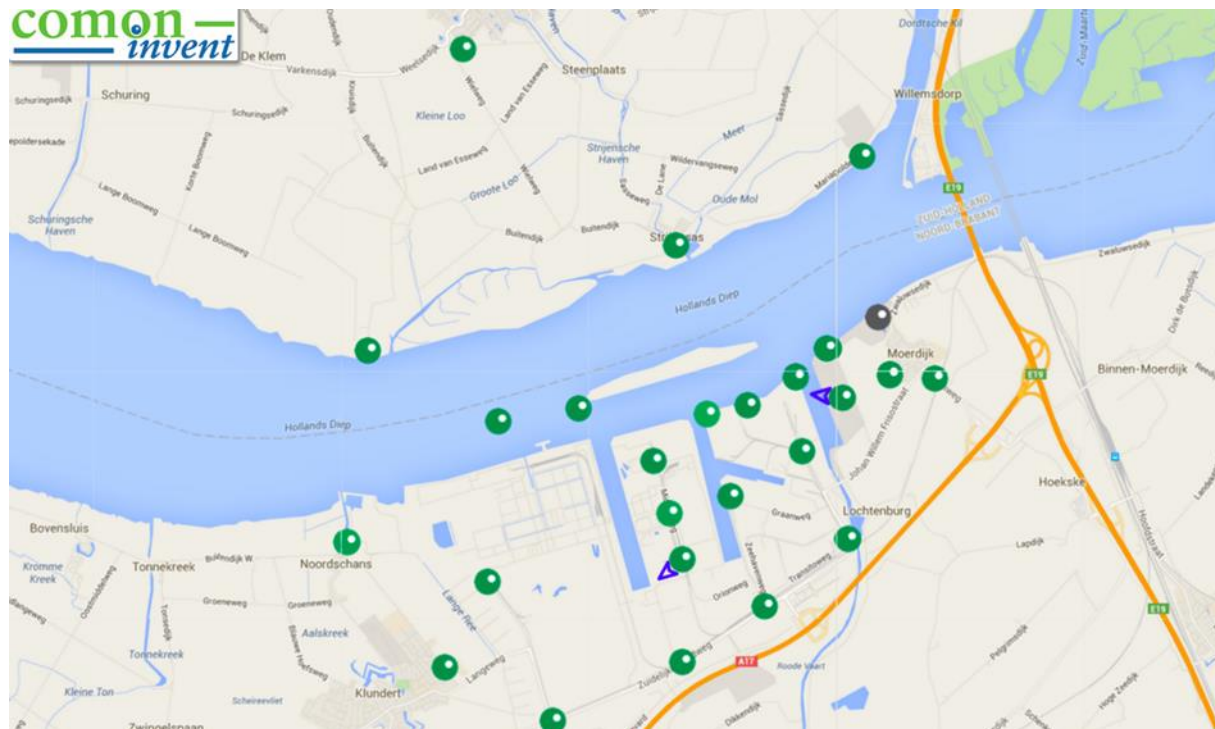
The Moerdijk Port Authority invests in nature in a variety of ways: with green buffer zones, with butterfly zones, ecological mowing management and bat boxes. Various companies at the port, and industrial park also contribute to the objectives for nature.

Environmental complaints

In 2018, 139 complaints related to the Moerdijk port and industrial park were reported, almost 14% less than the previous year. Over 80% of all complaints in 2018 related to air/odor. The number of complaints about noise nuisance remained the same versus 2017, at 10 complaints. In 2018, 9 out of 139 complaints (6.5%) were also reported as health complaints. Since 2014, there has been a decrease in the number of complaints, including in 2018.

ANNEX 1 – BACKGROUND INFORMATION ON ENOSES

At the beginning of 2013, several initiators started the pilot project 'Moerdijk eNose network'. This pilot was extended in late 2013 until 1 January 2021. The 'eNose network' involves a large number of organizations working together to include or exclude sources of emissions and odor nuisance. A total of 26 eNoses (electronic noses) have been installed in and around the Moerdijk port and industrial park. See figure below (source: Central and West Brabant Environment Agency).



The 'eNoses' show immediate (real-time) changes in air composition, but do not measure absolute values for certain substances. The 'eNose network' pursues several goals. In the first place, it is about obtaining additional information for the detection or exclusion of hydrocarbon sources. Additionally, it serves as an aid for research into and the reduction of odor complaints and as an early warning system for changes in air composition due to gas emissions.

The 'eNose network' was set up to provide an effective indication of the origin and distribution of emissions. The 'eNose system' database is filled with and trained using odors that occur in and around the Moerdijk port and industrial park. If a set level is exceeded, a message is sent automatically (by SMS or email) to the OMWB complaints service officer and any other participating bodies. If necessary, the complaints service officer then ensures that an investigation is carried out. The participating organizations can access the results of the 'eNose network' by consulting an online dashboard. Based on the network's data, they can take immediate action themselves based on their findings.

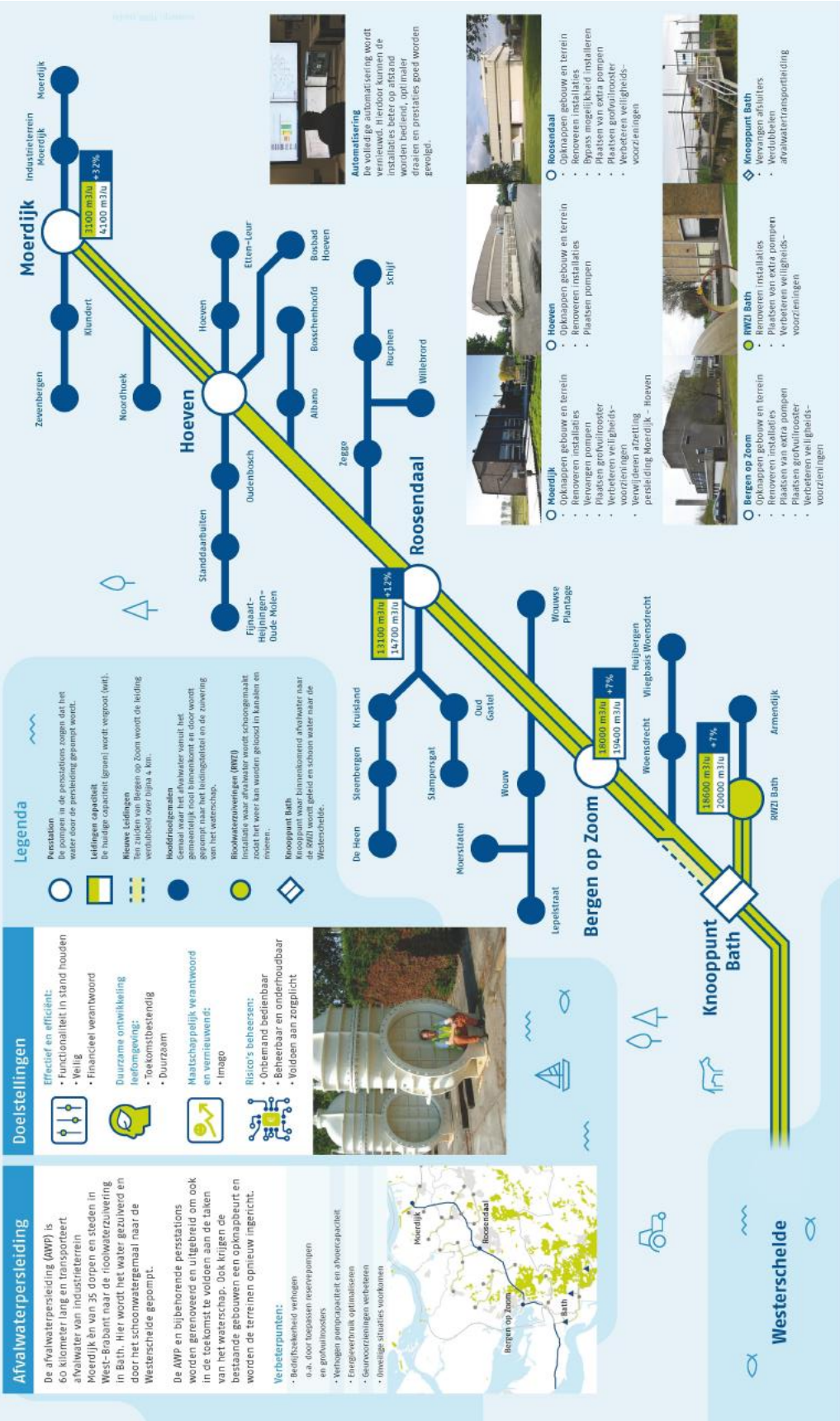
Indications and test cases for source detection yield good results. It turned out that certain odor nuisance not only comes from companies on site. Odor nuisance is also caused by ships degassing their cargo holds on Hollands Diep. As a result of joint political efforts, a provincial ordinance was achieved that took force as of 1 January 2015, restricting the degassing of ships carrying benzene. Since 1 January 2016, this also applies to benzene-containing substances.

Action points for further research are:

- Investigating the indications for current correlations between the results of the 'eNoses' and the permanent monitoring stations.
- Demonstrating the similarities between the increases (eNoses) in and around the industrial park and the complaints registered by the OMWB.
- Expanding the early warning system and early detection of sources by setting alarm levels.

ANNEX 2 – BACKGROUND INFORMATION ON WATER

Maatregelen aan de Afvalwaterpersleiding van 2017 – 2023



Translation of the previous poster:

Measures on the wastewater discharge pipeline from 2017-2023

Wastewater pressure main

The wastewater pressure main (WWPM) is 60 kilometers long and transports wastewater from the Moerdijk industrial park and from 35 villages and cities in West Brabant to the wastewater treatment plant in Bath. Here the water is treated and pumped through the freshwater pumping station to the Westerschelde.

The WWPM and related pumping stations will be renovated and expanded to ensure the waterboard can continue fulfilling its tasks in the future. The existing buildings will also be refurbished, and the grounds redesigned.

Points for improvement

- Increase operational reliability
partly by using spare pumps and coarse-debris screens
- Increase pumping capacity and discharge capacity
- Optimize energy consumption
- Improve odor countermeasures
- Prevent unsafe situations

Objectives

Effective and efficient:

Maintain functionality

- Safe
- Financially responsible

Sustainable development of living environment:

- Future-proof
- Sustainable

Socially responsible and innovative:

- Image

Managing risks:

- Unmanned operation
- Manageable and maintainable
- Satisfying duty of care

Legend

Pumping station

The pumps in the pumping stations ensure that the water is forced through the pressure main.

Mains capacity

The current capacity (green) is increased (white).

New mains

The mains will be doubled along almost 4 km to the south of Bergen op Zoom.

Main sewer pumping stations

Pumping station where wastewater enters from the municipal sewer and is pumped through to the mains grid and the waterboard treatment plant.

Wastewater treatment plants (WWTP)

Plant where wastewater is cleaned so that it can be discharged back into canals and rivers.

Bath junction

Junction where incoming wastewater is led to the WWTP and fresh water to the Westerschelde.

Knooppunt Bath	Bath junction
RWZI Bath	WWTP Bath
m ³ /u	m ³ /h
Vliegbasis Woensdrecht	Woensdrecht air base
Bosbad Hoeven	Bosbad Hoeven holiday park
Industrieterrein Moerdijk	Moerdijk industrial park

Automation

All automated processes are being updated. This will allow more effective remote control of the systems, ensure they run better and allow performance to be monitored more closely.

Moerdijk

- Refurbishment of building and grounds
- Renovation of systems
- Replacement of pumps
- Fit coarse-debris screen
- Improvement of safety features
- Removal of sedimentation in Moerdijk - Hoeven pressure main

Hoeven

- Refurbishment of building and grounds
- Renovation of systems
- Fit pumps

Roosendaal

- Refurbishment of building and grounds
- Renovation of systems
- Install bypass option
- Fit extra pumps
- Fit coarse-debris screen
- Improvement of safety features

Bergen op Zoom

- Refurbishment of building and grounds
- Renovation of systems
- Fit extra pumps
- Fit coarse-debris screen
- Improvement of safety features

WWTP Bath

- Renovation of systems
- Fit extra pumps
- Improvement of safety features

Bath junction

- Replacement of seal valves
- Double wastewater transport main

ANNEX 3 – DATA USED

Data processing

In recent years, the companies included and incorporated in the Environmental Monitor of the Moerdijk port and industrial park have remained the same as much as possible. This relates to companies that are obliged to report on their environmental impact due to environmental permits. They do this via an electronic annual environmental report (eMJV). So, this does not concern all the companies at the port and industrial park, but only those with a significant environmental impact. A significant portion of the eMJVs for the above-mentioned companies is used for the environmental aspects of energy, air, water, and waste.

Over the years, companies have dropped out (e.g. they fall below the threshold value for the reporting obligation and therefore no longer have to report) or have been added (e.g. they have established themselves at the Moerdijk port and industrial park and are subject to the reporting obligation). So, a relatively good comparison with previous years is possible, even though the picture can never be complete.

Variation in companies

Companies do of course drop out over time and new ones are added. The conclusions and comparisons between the different years are based on the specific situations of each of these years, and the corresponding figures. This means an exact (one-to-one) comparison is not possible at every point. However, it does not make the comparisons any less valid: companies that drop out are replaced with equivalent companies (in size, consumption, and emissions).

Completeness of data

Not every company has entered all the data in the eMJV (electronic annual environmental report) every year. Sometimes the data for some environmental aspects is not entered. As a result, the data varies from company to company and from year to year. This in turn affects the accuracy of the results and conclusions of the comparisons with previous years. Measures are drawn up and actions are taken to improve the quality and accuracy of data delivery and processing each year. The aim is to include all companies located at the Moerdijk port and industrial park in the Environmental Monitor at any given point in time, so that a complete picture of the situation at the Moerdijk port and industrial park can be created.

Land issued

Year	Hectares
2010	6.0
2011	13.1
2012	0.3
2013	1.2
2014	0.2
2015	6.0
2016	12.3
2017	7.1
2018	10.0

Shipping transshipment (x 1,000 tons)

	2016			2017			2018		
	Total	Marine	Inland shipping	Total	Maritime shipping	Inland shipping	Total	Maritime shipping	Inland shipping
Biomass	15	6	9	-	-	1	21	21	0
Containers	4,871	2,889	1,982	5,394	2,851	2,543	5,207	3,215	1,992
Ores, scrap	773	502	271	631	471	160	497	342	155
Grains and cattle feed	30	26	4	78	69	9	58	38	20
Coal	-	-	-	-	-	-	2	2	0
Mineral oil	763	92	671	931	136	795	1,030	218	812
Other bulk goods, dry	4,798	1,163	3,635	4,695	1,540	3,155	4,363	1,332	3,031
Other bulk goods, wet	5,031	1,613	3,418	5,481	1,783	3,698	5,594	1,789	3,805
Other break bulk cargo	1,253	428	825	1,351	440	911	1,387	482	905
Roll-on Roll-off	-	-	-	4	4	-	0	0	0
Crude oil	-	-	-	-	-	-	0	0	0
LNG	1	-	1	1	-	1	0	0	0
Total	17,535	6,719	10,816	18,567	7,294	11,273	18,161	7,439	10,722
			vs 2015			vs 2016			vs 2017
	6%	7%	5%	6%	9%	4%	-2%	2%	-5%

Total transshipment		x 1,000 tons
	2012	20,291
	2013	18,494
	2014	16,790
	2015	16,589
	2016	17,536
	2017	18,568
	2018	18,161

Rail transport (x 1,000 tons)

Year	Number of rail cars	Goods transported
2010	27,716	720
2011	26,769	664
2012	21,143	677
2013	15,530	476
2014	21,694	579
2015	21,832	649
2016	30,132	886
2017	43,445	1,427
2018	40,356	1,316

Energy consumption

Year	Electricity (incl. renewable electricity) [MWh]	Oil [tons]	Other	Natural gas [m ³]	Net heat used [TJ]	Self-generated renewable energy
2012	834,818	98,440	2,663,296	652,463,845	8,759	747000
2013	1,026,604	64,631	1,520,489	704,373,845	2,291	153,000
2014	893,828	53,002	1,184,730	511,228,163	2,271	215,000
2015	939,173	2,960	7,865,047	311,902,950	3,041	219,000
2016	962,141	3,543	7,291,882	742,164,851	8,903	24,037
2017	1,059,569	2,539	8,670,739	955,477,456	9,877	130,219
2018	1,203,871	1,439	9,016,588	598,282,553	63	643,766

CO₂ emissions

Year	kg	ton	millions of tons
2008	4,342,604,000	4,342,604	4.34
2009	4,271,977,640	4,271,978	4.27
2010	5,151,290,993	5,151,291	5.15
2011	4,853,107,697	4,853,108	4.85
2012	4,801,649,882	4,801,650	4.80
2013	4,680,095,224	4,680,095	4.68
2014	4,104,865,934	4,104,866	4.10
2015	3,761,815,697	3,761,816	3.76
2016	5,136,211,343	5,136,211	5.14
2017	5,794,129,983	5,794,130	5.79
2018	4,862,558,801	4,862,559	4.86

Air quality

Zevenbergen

Year	PM ₁₀			NO ₂			Benzene		
	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %
2013	21.7	1.1	5	21.7	0.9	4	2	0.2	11
2014	24.1	1.2	5	22.4	1.1	5	1.2	0.1	5
2015	22.1	0.9	4	21.4	1.4	5	0.9	0.3	11
2016	19.8	1	1	19.9	0.8	4	0.9	0.1	3
2017	19.8	0.7	4	20.4	1	5	0.8	0.1	3
2018	20.7	0.6	3	19.8	1	5	1.5	0.2	13

Klundert

Year	PM ₁₀			NO ₂			Benzene		
	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %
2013	20.6	0.8	4	21.6	No data		1.9	0.4	22
2014	21.4	0.1	0.5	19.8	No data		1.9	0.3	16
2015	20.2	0.1	0.5	21.7	1.2	6	1.7	0	18
2016	19.8	0.1	0.5	21	1.6	8	1.4	0.2	14
2017	20	0.8	4	21.4	0.8	4	1	0.07	7
2018	20.7	0.9	4	19.5	1.4	7	1	0.2	20

Strijensas

Year	PM ₁₀			NO ₂			Benzene		
	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %
2016	20.8	0.1	0.5	20.4	2.3	11	1.1	0.3	27
2017	16.8	0.4	2.5	19.6	1.7	9	1.4	0.5	36
2018	19.7	0.7	4	20.6	2.1	10	1.8	0.3	17

Moerdijk

Year	PM ₁₀			NO ₂			Benzene		
	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %	Concentration (µg/m ³)	Average contribution industrial park in µg/m ³	Average contribution industrial park in %
2008	25.4	2.9	11	28.9	3.7	13	No data		
2009	23.3	0.9	4	25.2	3.3	13	No data		
2010	25.5	0.3	1	28	2.1	7	1.8	0.5	29
2011	26.2	1	4	26.5	3.5	13	1.9	0.7	37
2012	20.4	1.8	9	24.9	3.3	13	2	0.8	39
2013	22.1	2.9	13	27.5	4.3	16	1.4	0.4	30
2014	22	2.4	11	24.1	3.9	16	1.3	0.3	25
2015	20.5	2.1	10	23	3.7	16	1.2	0.3	25
2016	21	2.3	11	20.7	2.1	10	1.3	0.4	31
2017	19	0.6	3	22	1	5	1.1	0.3	27
2018	19.8	0.4	2	19.8	2.2	11	0.7	0.1	14

Water consumption and discharge

		2014	2015	2016	2017	2018
Drinking water	m ³	1,089,000	1,089,000	1,066,350	1,209,448	1,238,239
Industrial water	m ³	4,250,000	4,217,000	5,423,597	5,304,508	5,492,508
Total water outlet	m ³	5,339,000	5,306,000	6,489,947	6,513,956	6,730,747
Wastewater discharged	m ³	5,953,000	5,861,000	6,369,000	6,346,000	5,768,000
Unit of pollution	u.p.	83,000	77,000	78,000	72,699	71,850

		2016	2017	2018
Discharge to surface water	m ³	1,043,990,375	1,169,278,937	1,151,142,918
Discharge to sewers	m ³	5,087,144	4,994,575	5,009,408
Other	m ³	-	766,965	625,484
Total	m ³	1,049,077,519	1,175,040,477	1,156,777,810

Waste processing data

Waste disposed of		2014	2015	2016	2017	2018
Hazardous waste total	ton	290,000	223,962	238,646	853,740	358,113
Hazardous waste disposed of to elsewhere in the Netherlands	ton	205,000	122,547	216,735	465,112	238,991
Hazardous waste disposed of to outside the Netherlands	ton	85,000	101,415	55,304	388,628	119,122
Non-hazardous waste total	ton	1,290,000	1,517,968	1,843,057	1,485,843	2,030,408
Total waste disposed of	ton	1,580,000	1,741,930	2,081,703	2,339,582	2,388,521

Processing method		2014	2015	2016	2017	2018
Recycling	ton	1,300,000	2,389,356	1,484,725	1,364,234	1,065,359
Energy recovery	ton	25,000	42,013	59,331	49,451	52,259
Incineration	ton	130,000	65,218	204,305	233,625	163,348
Landfill	ton	50,000	64,311	76,704	270,155	49,921
Waste separation	ton	70,000	93,768	43,125	45,268	97,913
Total	ton	1,577,014	2,654,666	1,868,191	1,962,733	1,428,801

Complaints

Year	Number of complaints	Number of complaint clusters
2011	385	7
2012	466	17
2013	416	10
2014	554	26
2015	325	10
2016	212	1
2017	163	1
2018	139	2

Distribution of complaints by category

	2015	2016	2017
General	3	3	2
Soil	1		1
Noise	7	23	10
Air	260	182	150
Water		1	
Flaring	54	3	

	2018
I hear	7
I smell	80
I feel	7
I see	6

Health problems and resolution rate

Year	Number of complaints	Cause of complaint established	Percentage resolved	Health problems	% Health problems
2009	307	45	15%	n.d.	n.d.
2010	244	96	39%	n.d.	n.d.
2011	385	226	59%	27	7.0%
2012	466	267	57%	76	16.3%
2013	416	263	63%	37	8.9%
2014	554	255	46%	42	7.6%
2015	325	194	60%	24	7.4%
2016	212	45	21%	14	7.0%
2017	163	44	27%	13	8%
2018	140	17	-	9	6%

APPENDIX 4: SOLUTION FORM 2

Nature Development and Management at the Port of Moerdijk

Project Description

The Port and Industrial Estate Moerdijk is home to a number of protected species for which the Port of Moerdijk has been granted an area exemption. These species mainly occur on plots of land still to be issued by the Port of Moerdijk. To this end, the Port of Moerdijk has drawn up a development and management plan, which shows the added value in the final phase of this development.

The Port and Industrial Estate Moerdijk is intended for the heaviest category of chemistry in the Netherlands. The site of the port and industrial estate has been designed in such a way that it can be handled as efficiently as possible. In practice, this means that, apart from the cables and pipelines and existing green structures, everything is issued to customers active in chemicals, dry and wet bulk, containers and other logistics activities. This avoids fragmentation of the chemical and industrial sectors in West Brabant. The added value for nature stems mainly from the green corridors between the companies and cable and pipeline strips. In addition, it is foreseeable that companies themselves will also invest in the ecological optimisation of their business park in the future by sowing native flower mixtures, placing bee hotels, vegetation roofs and green facades.

Mowing management of wide verges and pipe areas

The added value for nature lies mainly in the ecological management of the cable and pipeline strips, wide verges and existing green structures. The new management contract, drawn up in 2019, has implemented this by means of, among other things, phased mowing management and sinus mowing on cable and pipeline strips. In the past, these areas of vegetation were traditionally managed (mulching several times a year). Nowadays, mowing and removal is the norm, which results in more species of richness in flora and fauna. Herbaceous and insect-rich verges allow skylarks to settle in the cable and pipe strips (already established in 2019 and 2020).

Green space management

The management of green spaces is aimed at preserving biodiversity. The green spaces will be thinned in phases while retaining old wood. This ensures sufficient breeding space for songbirds, but it also serves bats in the form of summer housing, mating, winter housing and nursery. Now there are only functions known as summer and mating quarters for the rough dwarf bat. If old ecologically valuable trees are preserved in the green spaces, other bat species (such as the red bat, water bat and pond bat) can also be housed. The new management contract pays attention to lying dead wood in the case of thinning work. Processing some of the materials such as lying trunk lengths or parts of branches will create more biodiversity in the green spaces and will also provide shelter and a habitat for small ground-dwelling fauna. This creates great added value compared to the old management system, in which all released materials were disposed of or returned to the plants as shreds.

The green spaces in the future blueprint therefore form the green biodiverse interlacing of the Port and Industrial Estate Moerdijk (see figure 1) and will determine the green blueprint. Any overhangs created after the areas have been allocated will also be ecologically designed and managed, by managing them as hay meadows or by planting indigenous trees or shrubs that indigenous insects can use.



Figure 1. Green interlacing (schematic) where added value is achieved and maintained by means of ecological management.

In addition to the existing cable and pipeline strips and green spaces, the Port of Moerdijk wants to offer added value in the redevelopment of Moerdijk Plaza and the upgrading of the Appelzak compensation area near the core of Moerdijk. Both projects are briefly explained below.

Moerdijk Plaza

Because certain species may disappear after sites have been issued and developed (e.g. sand martins in sand mounds on issuable sites), the Port of Moerdijk wants to invest in sustainable locations around Moerdijk Plaza for these species. An artificial wall for sand martins is an example of this. Work is currently underway on a design for the redevelopment of the area around Moerdijk Plaza aimed at increasing biodiversity but also making this nature accessible to the people who work in the offices around Moerdijk Plaza. There will be a mosaic of natural elements next to the sand martin wall, butterfly strips, pools, bee hotels and tiny forest. The final design is expected in autumn 2020.

Appelzak

For the construction of Logistics Park Moerdijk (LPM) some herbal and fauna rich grassland and tree stands need to be compensated. If the LPM is realised, the Port of Moerdijk will convert a number of agricultural plots against the existing Appelzak into nature. In addition to the legal obligation to compensate for quantitative units of herbal and fauna-rich grassland and trees, the layout will also consist of realising long green strips around the forest stands, digging a creek, constructing various pools with different gradients, playful transitions between wet and dry, and elements such as an owl barn and sparrow huts. This nature will also become accessible to the residents of the core of Moerdijk. Construction is expected to start in the autumn of 2020. The non-statutory parts of the design will only be constructed if the provincial development plan for Logistics Park Moerdijk is irrevocably approved. A ruling from the Council of State is expected shortly after the summer.