NWB BANK

The Water Bond

Report 2018

Index

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THE WATER BOND

In 2018 NWB Bank has issued two new Water Bonds. In January a SEK 2 billion (€ 203 million) 10-year bond was issued followed by the annual benchmark Water Bond in November, a 4-year USD 500 million (€ 441 million) bond. The SEK bond was fully placed with so-called green investors. These investors either have a specific mandate to buy SRI products (Social Responsible Investments) or have ring-fenced SRI portfolios. The USD bond for a big part was also placed with SRI-investors. 38% of the bond was bought by American investors who always show great interest in NWB Bank's Green Bonds.

With the issuance of the two Water Bonds in 2018, NWB Bank has again underpinned its role as a sustainable financial partner for the public sector and further strengthened its leading position as issuer of Green Bonds worldwide within the group of SSAs (supranationals, sub-sovereigns and agencies). NWB Bank has issued 7 Water Bonds so far through which €3.6 billion in sustainable funding has been raised.

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USE OF PROCEEDS

Proceeds from the NWB Bank Green Bonds are dedicated to lending to the Dutch water authorities. NWB Bank qualifies 90% of its lending to the water authorities as eligible assets, thereby creating an extra buffer of 10% for the true greenness of the use of proceeds. Projects financed by the water authorities are according to the mandate given to the water authorities and managed by the water authorities and defined through the Dutch Water Act (Waterwet). The mandate of the water authorities is to do water management through mitigation, adaptation and biodiversity projects.

- Energy reduction and biogas production
- Reuse of nutrients and other substances
- Transport and treatment of wastewater
- Flood protection infrastructure
- Irrigation and drainage, pumping stations
- (Re)design of watercourses and wetlands for water storage and discharge
- Sanitation and dredging and waterbeds
- Improving water quality

An annual external audit of the earmarked account will confirm the lending done. According to plan NWB Bank has spent the proceeds from the Green Bonds in their lending to the water authorities.

The following projects of the water authorities are eligible:

Eligible project types	
Mitigation	1. Energy recovery from and extraction of phosphor
Adaptation	1. Flood protection 2. Other flood defences 3. Waterway management 4. Pumping stations
Biodiversity	1. Water treatment 2. Sanitation and dredging of waterbeds 3. Transport and cleaning of wastewater 4. Disposal of sewage sludge

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ENVIRONMENTAL POLICIES THAT GUIDE THE WATER AUTHORITIES

Under EU and national laws, the water authorities are required to develop a water management plan and report on the progress of implementation (confirmed by personal communication with Unie van Waterschappen).

Water management reports regarding the water quality and biodiversity impact of the plans are sent to the European Commission as a requirement under the European Water Framework Directive. Flood protection schemes are reported on a national level, but also subject to the European Flood Directive.

Treatment plans are reported under the European Urban Waste Water Directive. Under Dutch law, the water authorities are required to acquire an environmental permit for all initiatives, and perform an environmental impact assessment for large projects.

4 NWB BANK'S ROLE IN SOCIETY

With its specific qualities, the bank >

Financial capital
We are well-capitalised and raise low cost funding based on our significant size and our high degree of creditworthiness

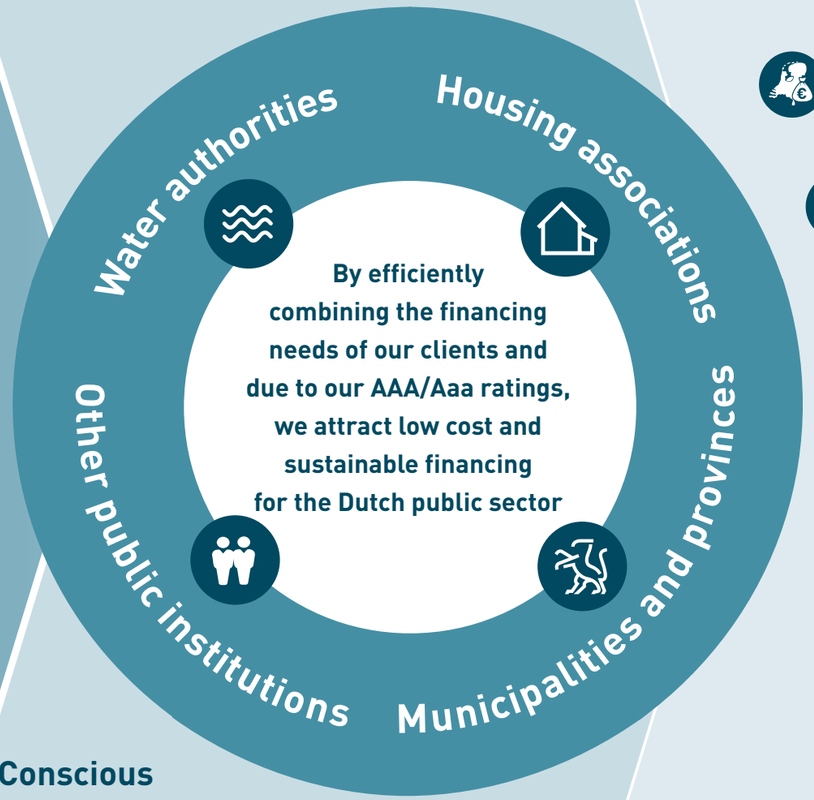
Social and relationship capital
We serve the entire public sector and act as national promotional bank in all relevant networks

Human capital
Our employees are committed, well-educated and motivated to use their talent for the bank and for our clients

Intellectual capital
We are a leader in the area of product innovation and sustainable funding through Green and Social Bonds

Organisational capital
We are a dedicated, professional and cost-conscious organisation with high sustainability ratings

...mobilises low cost capital >



Conscious
Engaged
Reliable

...for a sustainable public sector >

- Low financing costs for the Dutch public sector
- Financing solutions for sustainability enhancement in the Netherlands
- A responsible and social return for our shareholders
- Contribute to our employees' personal and professional development

...and for measurable social impact >

Low costs for citizens: low water tax and affordable social housing and healthcare

Sustainability enhancement in the Netherlands: facilitating climate adaptation, climate mitigation and biodiversity

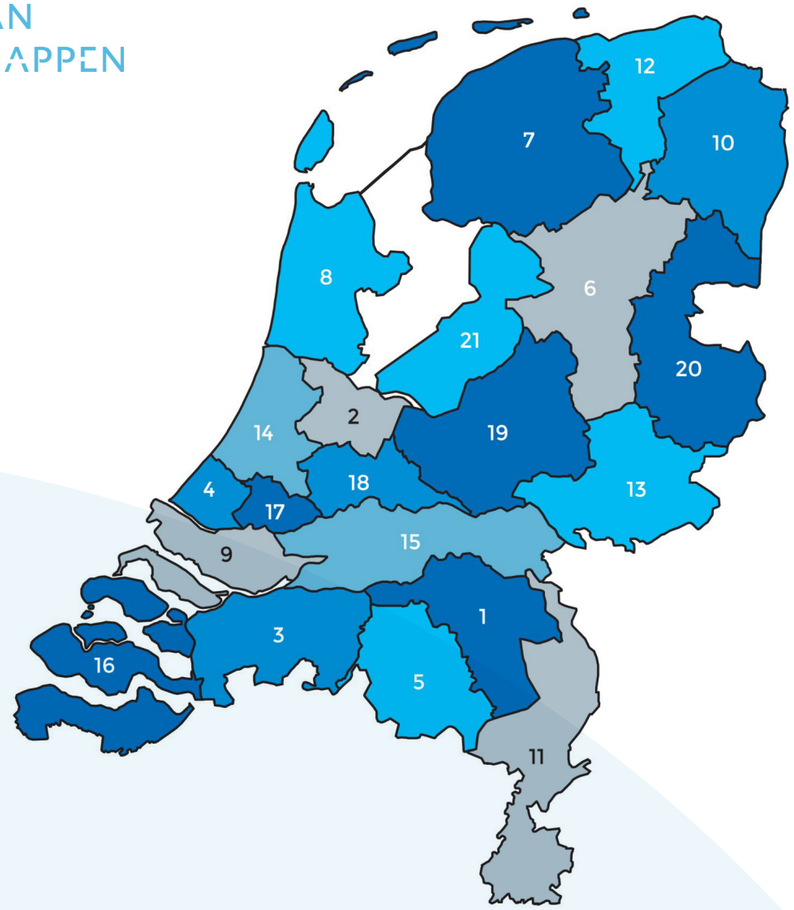
5

WATER AUTHORITIES

The Netherlands is a delta where four major European rivers (the Rhine, Meuse, Scheldt and Ems) flow into the North Sea. As a significant part of this delta is below sea level, water safety and effective water management are essential to ensure that the Dutch can continue to live, work, do business and relax. Because of the importance of tasks relating to water, these responsibilities have been allocated to sep-arate authorities in the Netherlands, namely the water authorities. Within their regions, the water authorities ensure adequate protection against our waters, the availability of high-quality water in the correct volumes, and the purification of wastewater that has been discharged into the sewage system by households and companies. Sustainability has been an essential part of this process since long before the term was invented. There are currently 21 water authorities. These water authorities employ more than 11,000 people.

The water authorities carry out their tasks with an infrastructure comprising 18,000 km of flood defences, 225,000 km of waterways, 6,175 pumping stations and 327 wastewater treatment plants. Due to changing circumstances such as climate change, rising sea levels, subsidence, urbanisation and industrialisation, this infrastructure is currently faced with substantial challenges. The water authorities see the effects of these changing circumstances in their daily activities. For this reason, they are doing everything in their power to mitigate climate change, adapt their infrastructure to the changing circumstances and continue to ensure that there is an adequate supply of high-quality surface water. Keywords that best summarise this approach include climate mitigation, climate adaptation and the improvement of biodiversity. With its Water Bonds, NWB Bank ensures that the water authorities have sufficient funds to achieve these goals. The remainder of this publication will outline what the water authorities have achieved over recent years in relation to the tasks with which they are faced in the areas of climate mitigation, climate adaptation and improving biodiversity.

UNIE VAN WATERSCHAPPEN



LEGENDA

1. Waterschap Aa en Maas
2. Waterschap Amstel, Gooi en Vecht
3. Waterschap Brabantse Delta
4. Hoogheemraadschap van Delfland
5. Waterschap De Dommel
6. Waterschap Drents Overijsselse Delta
7. Wetterskip Fryslân
8. Hoogheemraadschap Hollands Noorderkwartier
9. Waterschap Hollandse Delta
10. Waterschap Hanze en Aa's
11. Waterschap Limburg
12. Waterschap Noorderzijlvest
13. Waterschap Rijn en IJssel
14. Hoogheemraadschap van Rijnland
15. Waterschap Rivierenland
16. Waterschap Scheldestromen
17. Hoogheemraadschap van Schieland en de Krimpenerwaard
18. Hoogheemraadschap De Stichtse Rijnlanden
19. Waterschap Vallei en Veluwe
20. Waterschap Vechtstromen
21. Waterschap Zuiderzeeland

6

PLANNED INVESTMENTS

Over the period of 2018–2021, the water authorities will invest some €1.4 billion each year to ensure that their flood defences, waterways, pumping stations, water treatment plants and other water works are up to task, and are able to keep up with ever-changing conditions. The figures below show how the annual investment of €1.4 billion has been allocated across the various components making up the responsibilities of the water authorities for the period of 2018–2021.

		In million €	In %
Adaptation	Primary flood defences	495	35%
	Other flood defences	125	9%
	Water system management, quality and quantity	210	15%
	Water level management	90	6%
Biodiversity	Sanitation and dredging of waterbeds	35	2%
Biodiversity/mitigation	Transport and treatment of wastewater	310	22%
	Disposal of sewage sludge	55	4%
Miscellaneous	Planning	20	1%
	Roads	10	1%
	Managing waterways	5	0.5%
	Other	50	3%

These investments are largely funded by long-terms loans from NWB Bank. The bank's Water Bonds have served as a source of funding in many cases.

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CLIMATE MITIGATION

NEW APPROACH TO ENERGY AND RAW MATERIALS

It is precisely because the water authorities have seen the huge consequences of climate change that they have ambitious targets in respect of the transition to a more sustainable energy supply and a more circular economy. They are doing their utmost to reduce their footprints by improving energy efficiency, reducing carbon emissions and closing the raw material cycles. By seeking to become energy-neutral as a sector by 2025, the water authorities are making a substantial contribution to the National Climate Agreement, which was presented in the Netherlands on 21 December 2018. The key target in this Agreement, aimed at countering climate change, is to achieve a 49% reduction in greenhouse gases by 2030 compared with 1990 levels. This figure amounts to a reduction in greenhouse gases of 48.7 megatonnes (48.7 billion kilograms). The water authorities issue an annual report, the Water Authorities Climate Monitor, to provide insight into the progress made towards energy neutrality in 2025. NWB Bank became a co-sponsor of this report last year. For a more detailed account of many of the results published in this section, see the 2017 Monitor (https://www.uvw.nl/wp-content/uploads/2018/12/Klimaatmonitor-waterschappen-2017.pdf?x27930).

Sustainable energy

Large amounts of energy are consumed particularly during the purification of wastewater. The water authorities contribute towards climate mitigation by ensuring that as much as possible of the energy used comes from sustainable sources. The data below show that the water authorities have had a sustainable energy percentage of more than 100% since 2013. A percentage greater than 100% means that the water authorities supply sustainable energy to third parties.

	2011	2013	2015	2017
Share of sustainable energy in total energy consumption	87%	100%	103%	112%

Self-generated energy

In performing their core tasks, the water authorities seek to generate as much energy themselves as possible. The purification of wastewater is one of the processes that is particularly suited to this goal, as its waste product is sludge, which can be used to produce biogas. Although this biogas is mainly used to generate electricity, it can also serve as a fuel in vehicles. In late 2017, 13 of the water authorities' wastewater treatment plants had been converted into 'Energy Factories', while 12 plants were investigating or preparing for the creation of an Energy Factory. An Energy Factory is a wastewater treatment plant that generates more energy than the plant itself needs. The water authorities are one of the largest producers of biogas in the Netherlands. The figures below show how their biogas production has grown.

	2011	2013	2015	2017
Quantity of biogas produced in millions of m³	102.5	111.6	112.2	120.8

As well as biogas, the water authorities also use their sites and assets to produce energy from wind, the sun, hydropower and thermal energy. The data in the following table show that the share of the total energy consumption that is self-generated by the water authorities increased considerably in the past few years. As previously stated, the water authorities aim to become completely energy-neutral by 2025. According to the Climate Monitor, they are on schedule and are confident that this goal will be achieved.

	2011	2013	2015	2017
Share of own production in total energy consumption	25.0%	27.5%	29.7%	33.9%

Not only do the water authorities generate their own energy, but they also make their sites and resources available to parties such as citizen cooperatives and companies that use them to produce energy. In 2017, the scale of this energy production was equivalent to 8.7% of the energy consumption by all water authorities combined. The percentage in 2015 was 6.0.

Closing cycles: producing raw materials and sustainable procurement

The growth in the world's population means that our resources are becoming more and more depleted. It is therefore essential that we use our raw materials more efficiently. To contribute towards this goal, a national Raw Materials Agreement was concluded in 2016, to which the water authorities became a signatory.
The aim of this agreement is to ensure that the Netherlands has a 100% circular economy by 2050. A key pillar of this goal is to view waste flows as a source of sustainable energy and valuable raw materials. The water authorities aim to achieve this goal by using innovative techniques to recover substances such as phosphorus, cellulose, bioplastics and alginate from wastewater, as well as to turn the biomass that is produced during processes such as waterway maintenance into paper and composite materials. Phosphorus can be reused as a fertiliser in the agricultural sector, while cellulose can be used as a dripping inhibitor for asphalt in the construction of roads. Alginate can be used to make paper and cardboard water-repellent, to reduce the leaching of fertilisers used in agriculture and to extend the useful life of concrete via improved hardening. Bioplastics are used in the plastics industry.

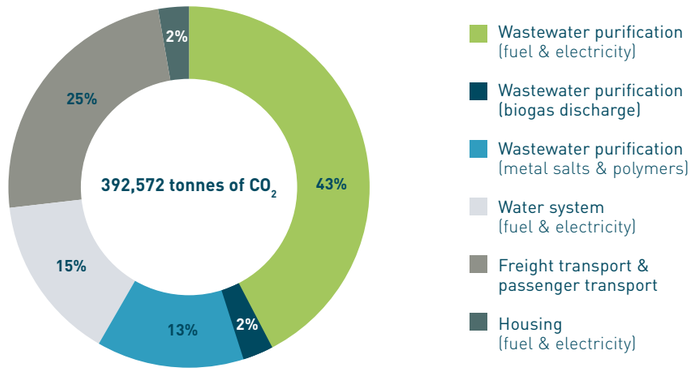
The water authorities spend more than €2 billion on goods and services in the market each year. By applying sustainability criteria in their tendering and procurement procedures, they also help to create closed cycles. The water authorities have reached agreements in this regard with other authorities and the business sector in the Manifesto on Socially Responsible Procurement (2016) as well as the Green Deal for Sustainable Civil and Hydraulic Engineering 2.0 (2017).

Carbon footprint

The energy data for wastewater purification show that the water authorities reduced their carbon footprint by 52% in the period of 2005–2017 (= 241,000 tonnes of CO_2). The generation of biogas and the procurement of green electricity made a major contribution in this respect. In 2017, the water authorities' total carbon footprint was 392,600 tonnes of CO_2, which is equivalent to the carbon emissions of more than 49,000 households.

The following figure shows a breakdown of the carbon footprint across the water authorities' various activities.

Breakdown of CO_2 by activity (2017)



DE DOMMEL WATER AUTHORITY'S ENERGY FACTORY IN TILBURG

The sewage sludge from all wastewater treatment plants run by De Dommel Water Authority in the province of North Brabant forms the input for an Energy Factory constructed at a treatment plant in the city of Tilburg (province of North Brabant). The sludge is pre-treated at the Cambi plant: a huge 'pressure cooker'. At this plant, the sludge is 'cracked' at a high temperature and pressure. The cracking of the biomass produces additional fermentable material. This material is subsequently pumped to the digestion plant, where bacteria convert the generated biomass into biogas, a process that takes 15 to 20 days. The biogas is used to produce steam for the Cambi plant and as a fuel for gas engines, which turn it into electricity. Biogas is also supplied to a neighbouring company. This company reprocesses the biogas to make green gas, which is injected into the central gas grid that supplies gas to domestic, commercial and industrial users.

In 2017, this plant produced: 6.2 million m^3 of biogas and achieved a net saving of 8,176 tonnes of CO_2, which corresponds to a reduction in emissions of more than 1,000 households.

Once the plant is operating at full capacity in 2019, it is expected to produce 9 million m^3 of biogas.

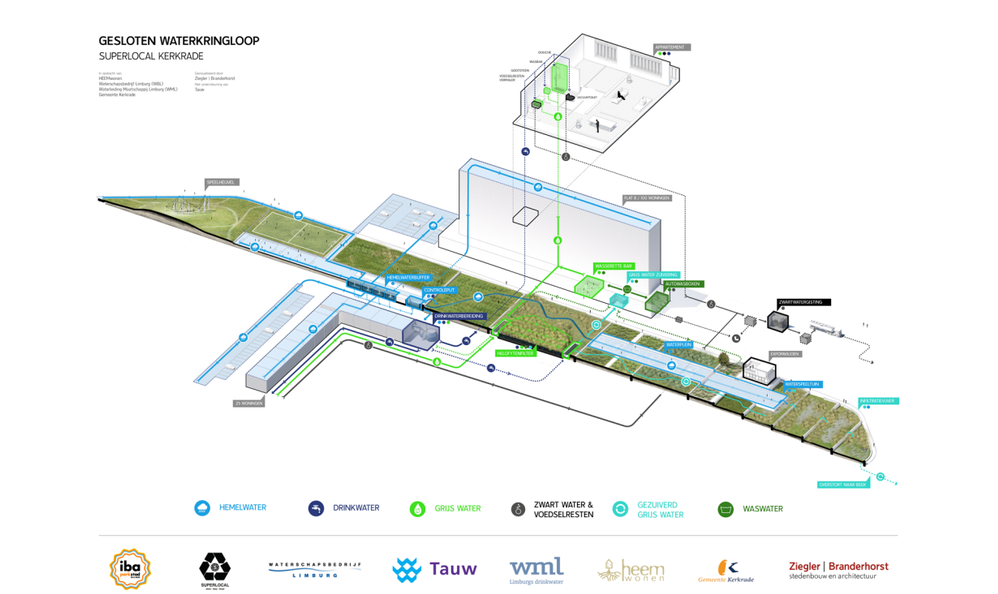
AA EN MAAS WATER AUTHORITY: MAKING GOOD USE OF BIOGAS

Aa en Maas Water Authority's wastewater treatment plant in the city of Den Bosch (province of North Brabant) has played a major role in sustainable energy production since spring 2018. The water authority used the opportunity of a plant renovation to obtain as much biogas as possible from the sludge, the byproduct of a wastewater treatment plant.
This biogas is used by Heineken's brewery in Den Bosch and the municipality of Den Bosch's Waste Management Service. While Heineken uses the biogas to heat water for the brewing and packaging process, the Waste Management Service runs its refuse lorries on the green gas. One of the ways in which biogas is generated is via heat from the Waste Management Service's biomass plant.

The Aa en Maas Water Authority supplies an amount of biogas equivalent to the average gas consumption of around 3,000 households per year.

Heineken will purchase 4.7 million m^3 of biogas per year from 2019 and the Waste Management Service around 0.6 million m^3 per year. The latter is sufficient to power more than 30 clean refuse lorries in and around Den Bosch. This project will deliver a net saving of 7,781 tonnes of CO_2, which corresponds to a reduction in emissions of more than 1,000 households.

SUPERLOCAL: COMPLETE CLOSURE OF THE WATER CYCLE IN KERKRADE



The water chain comprises the production and supply of drinking water, the disposal of wastewater via the sewage system and the purification of wastewater. Many parts of the current water chain are not resistant to climate change, which means that a transition is needed. On a scale of 125 homes in the city of Kerkrade, an intensive collaboration between the Limburg Water Company, the municipality of Kerkrade, Heemwonen housing association and Limburg Water Authority has led to the creation of a sustainable overall concept that includes the entire water chain. The aim of the SUPERLOCAL project is to close the water cycle as thoroughly as possible. Rain water is collected, buffered and purified to pro-duce drinking water.

Wastewater flows are separated: black water undergoes a hyperthermophilic fermentation process to produce fertiliser, while grey water is purified to produce washing water. As this concept allows rain water to be used directly, it does not end up in the sewage system. Buffers are also in place to deal with problematic levels of rainfall and to meet peak demand for drinking water in dry periods. The result is an entire climate-adaptive district with a positive effect on the environment.

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CLIMATE ADAPTATION

FLOOD PROTECTION AND MODIFICATION OF THE WATER SYSTEM

The rapidly changing climate is currently the water authorities' top priority. The heavy rainfall that until recently was not expected to be seen before 2050 is already a regular occurrence. Rainfall, drought and temperature records are being broken repeatedly. Extremely heavy showers in May 2018 caused major disruption and damage, while the Netherlands has never seen a drier and hotter summer than that of 2018. Climate change increases the likelihood of flooding or excess water in extreme peak downpours, long periods of drought as well as heat stress in towns and cities. The water authorities are adapting their infrastructure to the new climatic conditions, referring to this process as 'climate adaptation'.

Protection against flooding

A large part of the Netherlands is situated below sea level. Without solid flood defences, there would be regular floods that could endanger the lives of inhabitants and cause significant economic damage. The water authorities manage and maintain more than 3,300 km of primary flood defences. These provide protection against flooding from the sea, the major rivers, and the IJsselmeer and Markermeer lakes, in addition to 14,000 km of non-primary flood defences.

New statutory safety requirements were introduced to the primary flood defences in 2017, which de facto reduce the likelihood of anyone drowning due to flooding to 1 in 100,000 per year. If a flood defence does not comply with the standard, this does not mean that there is an acute danger of flooding. The structure will, however, have to be strengthened with a view to the future. In the period of 2017–2023, all primary flood defences as well as the 256 locks and pumping stations will be assessed on the basis of the new standards. As the assessment has only recently begun, it is not yet possible to provide any information on the results.

A standard will also be introduced for the non-primary flood defences in due course. In late 2017, a standard was established for 9,915 km of these flood defences and 9,543 km was assessed on the basis of the standards. The following table shows the length of the other flood defences that complied with the standards for the period of 2011–2017.

	2011	2013	2015	2017
Km of non-primary flood defences that comply with the safety standards	5,072	5,944	4,822	6,290

The reason that the number of kilometres which met the standard in 2015 was lower than in 2013 is that stricter requirements were introduced; flood defences that met the applicable standard in 2013 no longer complied on the basis of the stricter standard in 2015.

Modification of the water system

Ensuring an adequate water supply is one of the water authorities' core tasks. An adequate quantity of water is vital for the agricultural and recreation sectors, nature, the collection of drinking water, industry, and the shipping and fishing industry. This fact means that flooding and water shortages must be limited as far as possible. The climate change now under way is making this challenge ever greater. To this end, the Freshwater Delta Plan was presented in 2016 and the Delta Plan on Spatial Adaptation in 2017, with the aim of ensuring that the country is water-robust and climate-proof by 2050. Alongside the Government, the municipalities, the provinces, private parties and companies, the water authorities are investigating which measures prove the most effective to reduce the effects of changing circumstances as much as possible. As a consequence of this investigation, water authorities are to take measures in order to prepare the Netherlands better for extreme weather, such as establishing new water storage areas, increasing the capacity of existing water systems and expanding the number of pumping stations.

The Delta Plan on Spatial Adaptation is not the first initiative aimed at preventing flooding as far as possible. Standards were drawn up to prevent 'unacceptable flooding' in 2003. They were laid down by the central government, the provinces and the municipalities in the National Administrative Agreement on Water. Under this plan, each water authority region is provided with standards by the province, after which they must put in place measures to ensure that their regions comply with these standards. The table below shows that these measures have been successful: the percentage of the areas managed by the water authorities that complies with the standards has risen.

	2011	2013	2015	2017
Percentage of areas managed by water authorities that comply with the standards for flooding	98.0%	99.0%	99.1%	99.2%

THE COARSE SAND BARRIER: AN INNOVATIVE SOLUTION TO PREVENT DYKE EROSION

A considerable number of the Netherlands' dykes are vulnerable to 'piping': when groundwater flows under these dykes, it can wash away sand from the base of the dyke. If too much sand is washed away, there is a risk that the dyke may collapse. Rivierenland Water Authority, a water authority in the centre of the Netherlands, has collaborated with the Deltares company and the Flood Protection Programme to develop a new dyke reinforcement technique: the coarse sand barrier. The coarse sand barrier is essentially a smart sand filter in the dyke that prevents the problem of piping in a natural way.

While this barrier allows groundwater to flow below a dyke, it stops the fine sand from being washed away from the centre of the dyke, therefore preventing the dyke from collapsing. The coarse sand barrier has proven to be effective in a number of test set-ups.

Until recently, a protective structure made of concrete, steel or synthetic material had to be installed on dykes where space is limited. The coarse sand barrier eliminates the need for such structures, leading to significant cost savings.

ENERGY-SAVING REGULATION OF POLDER PUMPING STATIONS AT SCHELDESTROMEN WATER AUTHORITY

The polder pumping stations are responsible for 40% of the energy consumption of Scheldestromen Water Authority, a water authority in the province of Zeeland. The Scheldestromen Water Authority has developed a new method of regulating the pumping stations that automatically responds not only to high and low water levels but also to the weather conditions. This method leads to energy savings and better drainage, reducing the risk of flooding. The method is also beneficial for fish migration, as well as combating salinisation and dehydration of the soil. Each pumping system has an operating system that detects the tides and the weather conditions based on level measurements. The pumping stations now operate almost exclusively at low water, with considerable energy savings.

For the polder pumping stations that discharge into tidal waters, the saving is 15–25%: a reduction of one million kilowatt hours of electricity per year, which is enough to supply energy to more than 330 households. The CO_2 reduction achieved with this initiative is 526 tonnes per year, corresponding to a reduction in emissions of 65 households.

URBAN WATER BUFFER: REDUCING FLOODING AND DROUGHTS

Heavy rain showers can cause major problems, particularly in urban areas. Owing to the many buildings and surfaced areas, the water cannot run off and sewers overflow. In the Spangen district of Rotterdam, a consortium of municipalities, businesses, knowledge institutions and water authorities (of which the Delfland Water Authority is one) has applied an innovative concept that retains rainwater in the ground for longer. This Urban Water Buffer prevents flooding and makes additional water available in periods of drought. Thanks to a deep infiltration system, the Urban Water Buffer has a greater discharge capacity than conventional infiltration. The water also remains available for later recovery and use. Moreover, the built-in biofilter purifies contaminated rainwater. Because the square has been constructed as a colourful public garden, it also helps to create a greener urban environment.

9

WORKING ON BIODIVERSITY BY IMPROVING WATER QUALITY

WASTEWATER PURIFICATION AND OTHER MEASURES

The water authorities are also working to ensure that surface water is clean and ecologically healthy. They are aiming to obtain not only optimum water quality for water users such as the agricultural sector, anglers, recreational boaters and swimmers, but also healthy biological and chemical conditions for the flora and fauna living in the water. The result is an increase in biodiversity. The water authorities are doing so using two methods:

- the purification of the wastewater produced by the 7.8 million households and 1.7 million businesses in the Netherlands;
- measures for surface water to improve living conditions in and around the water as well as to prevent spills and dumping of contaminated substances in the surface water.

Purification of wastewater

The water authorities use their 327 sewage treatment plants to make sure that wastewater is clean enough to be drained in the surface water without any adverse effects on water quality. The extent to which the substances that are most harmful to surface water are removed from the wastewater gives a good indication of the quality of the water authorities' wastewater purification processes. Those substances include phosphate and nitrate compounds, as well as oxygen-binding substances. Pursuant to European legislation, 75% of both the phosphates and the nitrates must be eliminated from the wastewater, whereas a minimum of 90% is applied for oxygen-binding substances in the Netherlands.

The following table shows that the quality of wastewater purification in relation to the standards is high and has improved further still in recent years.

% of quantity of substances eliminated from wastewater	2011	2013	2015	2017
phosphates	84.5	84.7	85.3	86.2
nitrates	83.9	83.9	83.4	84.2
oxygen-binding substances	92.1	92.5	93.0	92.7

Water Framework Directive

The EU Water Framework Directive (WFD) stipulates minimum quality requirements that apply to a significant portion of the waters in the Netherlands. This directive, which entered into force in the various Member States of the European Union in 2000, contains agreements designed to ensure that the water in all Member States is sufficiently clean and healthy by 2027. In other words, a 'good chemical status' and 'good ecological potential' must be achieved. Interim analyses have shown that the water quality in the Netherlands still needs to improve significantly over the years ahead in order to meet the WFD targets. Contamination due to substances including pesticides, manure and new emerging chemical materials, such as drug residues and hormones, remains a major challenge. In conjunction with other parties, the water authorities are working hard on a comprehensive approach to reduce these substances in the surface water. The water authorities are collaborating with citizens, businesses, farmers and other authorities to devise solutions and launch practical initiatives; for instance, as part of the Delta Strategy for Water Quality (Delta-aanpak Waterkwaliteit). They are also investigating other sources of surface water contamination, such as seepage and their own sewage treatment plants, as well as continuing to improve the planning and management of the waters under their control. Examples of measures that fall under the latter category are the construction of environmentally friendly shores and banks as well as of weirs passable to fish, or the removal of polluted waterbeds.
The following table shows the percentage of bodies of water managed by the water authorities in which the surface water meets the standards in the WFD for 'priority hazardous' substances. These substances form a threat to the health of humans and animals, and must therefore be kept out of the surface water as much as possible.

	2011	2013	2015	2017
Percentage of bodies of water in which the surface water meets the standards for priority hazardous substances	77%	53%	43%	43%

Although these figures appear to indicate a substantial decline in the percentage of bodies of water that met the standards in the period of 2011–2015, this period saw the addition of a number of substances to the assessment list and a tightening of the standards. As a result, it is only possible to compare the results for 2015 and 2017.

Quality of bathing water

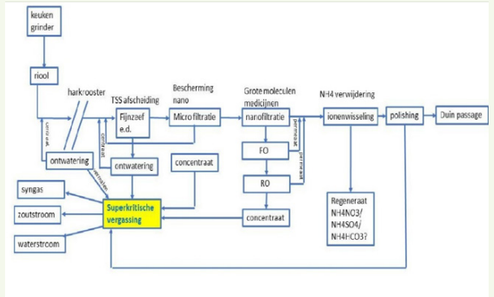
Another accurate indicator of the quality of the surface water is the share of the bathing water locations that comply with the European Bathing Water Directive. Within the waters managed by the water authorities, there were 488 officially designated bathing areas in 2017. In that year, 73% of these locations received an 'excellent' quality rating and 18% a 'good' rating; the water quality was 'satisfactory' at 6% of the bathing areas and 'unsatisfactory' at 3%. The data below show that there have been considerable improvements in bathing water quality since 2012.

	2012	2013	2015	2017
Percentage of bathing water locations that comply with the European Bathing Water Directive	92%	95%	97%	97%

NEW HART: REMOVAL OF DRUG RESIDUES FROM WASTEWATER

Over the years ahead, the water authorities will need to invest millions of euros in additional purification steps so as to remove drug residues from wastewater. The challenges that they face are difficult to integrate with the existing wastewater purification methods, which result in water that is clean enough to discharge but far from good enough to be reused. To this end, the 'New Hart' purification method was developed by two water authorities in the province of North Holland (Hollands Noorderkwartier and Rijnland), together with the water company PWN and a number of businesses. This method removes all harmful substances in one go and converts them into green natural gas.

The 'New Hart' method uses a combination of several physical and chemical techniques, including advanced membrane technology. This membrane technology first intercepts the bacteria, followed by nanofiltration, which even intercepts drug molecules, microplastics and antibioticresistant genes. The water left over after the nanofiltration contains only some salts and all the nitrogen, which is then removed by ion exchange. A final processing step produces high-quality water and nitrogen. Both the water and the nitrogen can now be reused.



Source: Wikimedia Nederland

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APPENDIX

Water Bonds issued in 2018	
SEK 2 bln 10 years	203.000.000
USD 500 mln 4 years	441.000.000

Use of proceeds	
Total loans	722.200.000
Use of proceeds	644.000.000 (90% of total loans)
Balance of non-disbursed cash	0

Use of Proceeds					
Trade date	Notional	Maturity in years	Trade date	Notional	Maturity in years
2017-04-18	10,000,000.00	20	**2017-04-18**	10,000,000.00	20
2017-04-18	10,000,000.00	20	**2017-04-18**	10,000,000.00	20
2017-04-18	10,000,000.00	20	**2017-04-18**	10,000,000.00	20
2017-04-18	10,000,000.00	20	**2017-04-18**	10,000,000.00	20
2017-04-18	10,000,000.00	20	**2017-04-18**	22,000,000.00	43

Use of Proceeds					
Trade date	Notional	Maturity in years	Trade date	Notional	Maturity in years
2017-04-18	4,600,000.00	43	**2017-10-24**	10,000,000.00	20
2017-04-18	25,100,000.00	44	**2017-10-24**	4,500,000.00	20
2017-04-18	26,400,000.00	45	**2017-10-24**	15,500,000.00	20
2017-04-18	26,400,000.00	46	**2017-12-14**	16,000,000.00	2
2017-04-21	10,000,000.00	12	**2018-02-21**	15,000,000.00	20
2017-04-21	10,000,000.00	14	**2018-03-08**	15,000,000.00	21
2017-04-21	9,500,000.00	21	**2018-05-03**	12,920,000.00	2
2017-04-21	8,300,000.00	24	**2018-05-28**	840,047.00	10
2017-05-11	20,000,000.00	20	**2018-06-11**	10,000,000.00	1
2017-06-21	10,000,000.00	20	**2018-06-11**	7,000,000.00	1
2017-06-26	7,666,666.00	3	**2018-08-27**	50,000,000.00	20
2017-06-28	5,000,000.00	30	**2018-08-30**	60,000,000.00	25
2017-07-05	5,000,000.00	25	**2018-09-18**	20,000,000.00	3
2017-07-07	1,871,741.00	20	**2018-09-19**	7,600,000.00	2
2017-07-18	20,000,000.00	18	**2018-09-27**	20,000,000.00	30
2017-07-18	20,000,000.00	23	**2018-10-15**	25,000,000.00	25
2017-07-25	6,000,000.00	20	**2018-10-22**	400,000.00	19
2017-09-11	25,000,000.00	20	**2018-10-22**	500,000.00	19
2017-09-21	30,000,000.00	20	**2018-10-22**	640,000.00	19
2017-10-09	10,000,000.00	25	**2018-10-22**	8,460,000.00	19
2017-10-09	10,000,000.00	25	**2018-10-22**	30,000,000.00	25
2017-10-24	10,000,000.00	20	**Grand Total**	**742,198,454.00**	

SECOND OPINION CICERO

Summary

Overall, NWB Banks's green bond framework and the governing laws of the regional water authorities provide a holistic and sound framework for climate-friendly investments. In the Netherlands, water management is a matter of survival. More than fifty percent of the country would be under water if the infrastructure, knowledge and institutional structure was not up to standard. Water resources and flood protection are managed by 23 autonomous, publicly owned, regional water authorities, sometimes called water boards.

The water authorities integrate a range of environmental impacts in their project plans, and perform environmental impact assessments on all large projects. The green bond framework lists eligible projects that are generally supportive of the dual objective of promoting a transition to low-carbon and climate-resilient growth, and improving biodiversity. NWB Bank provides regular and transparent reports to investors and the public. The regional water authorities take an integrated approach to climate change and biodiversity projects, and the bond framework does not include any biodiversity projects that would have a negative impact on the climate. The water authorities are public entities subject to regular and comprehensive reporting at the national and EU level. NWB Bank reports on environmental impacts and carbon footprint of its activities, including activities financed by the green bond, according to the GRI Global Reporting Framework.

Proceeds from NWB Bank's Green Bonds can also be used for re-financing purposes. The amount of new loans will be reported by NWB Bank in the annual investor letter.

Based on an overall assessment of the project types that will be financed by the green bonds and governance and transparency considerations, NWB Banks´s Green Bond Framework gets a Dark Green shading. The framework includes elements that are not dark green such as roads, pumping stations running on fossil fuel and fossil fuel transportation related to treatment and water management. We recommend that NWB Bank supplements their emission reports with additional reporting on methane emissions (from treatment), and also that NWB Bank in their investor letter makes impact information easier accessible for investors.

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