NWB BANK

Water Bond Report

2024

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AT A GLANCE

- Preface
- Introduction
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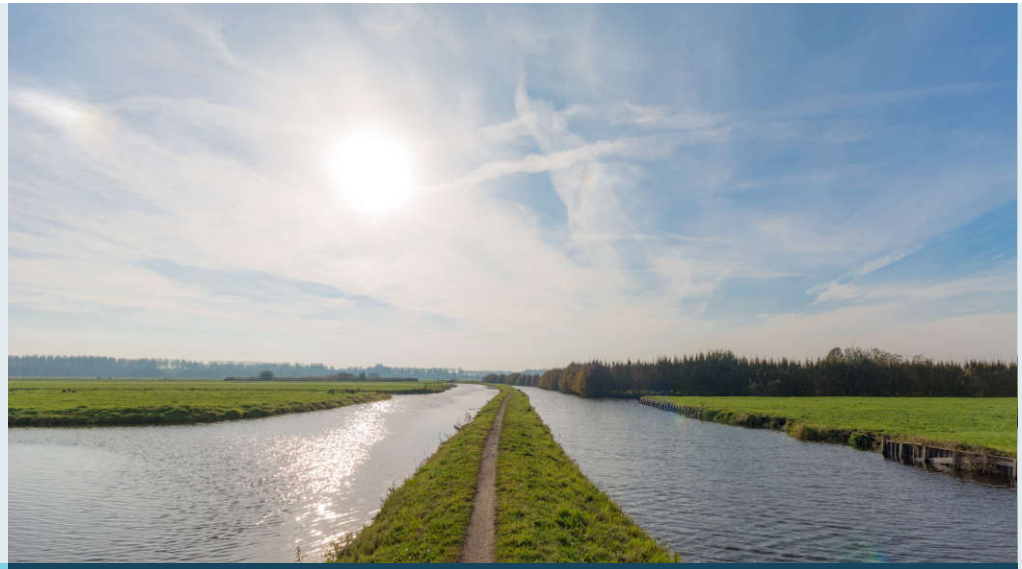
Preface



Lidwin van Velden
Chair of the Managing Board

Since 2014, NWB Bank has issued 15 Water Bonds for a total of € 9 billion to finance the activities of the Dutch water authorities. In 2024, we issued a total of €1.1 billion including a €1 billion 7-year Benchmark Water Bond.

What is the specific role of the water authorities in the Netherlands?

"The name 'Netherlands' means low-lying country. The Netherlands is known abroad for the significant part of the country that is below sea level. The Netherlands has a coastline of approximately 525 km and four major European rivers – Rhine, Meuse, Schelde and Eems – flow through the Netherlands towards the North Sea. If water management was not in order, or if there were no strong dikes, about 70% of the Netherlands would regularly be flooded. Protection of the land against water and good water management are essential in the Netherlands to enable living, working, entrepreneurship and recreation. In the Netherlands, these tasks are assigned to separate and independent governmental bodies: the water authorities."

What do you see as the biggest challenge for the water authorities these days?

"Water authorities are experiencing the effects of climate change on a daily basis. With current climate change, but also due to land subsidence, urbanization and industrialization, water authorities face ever increasing challenges to protect our country against the water and nowedays also more and more against droughts. They need to adapt their infrastructure to changing conditions, and in the meantime continue to provide sufficient and highquality surface water. In that respect biodiversity and ecology also play an important role in the work of the water authorities."

All these challenges are translated into an even bigger investment need of many billions in the coming years. As the bank of and for the water authorities it is important that we are always available for them to provide appropriate and affordable financing and the issuance of Water Bonds plays an important role in this process."

What do you think of the ambitions of the water authorities?

"Water authorities are frontrunners within the Netherlands when it comes to sustainability. The Dutch water authorities have an ambition to be climate neutral as early as 2035.

This is an important and unique ambition that sets the bar higher than the national target. The 21 water authorities have laid down their ambition in the strategic vision *Towards climate neutrality*, which also states that they will map their climate footprint even better. They are looking at their own greenhouse gas emissions, including nitrous oxide and methane from wastewater treatment plants, as well as emissions from third parties working on behalf of the water authorities. They also aim to reduce greenhouse gas emissions in their surroundings, for example from peatlands, surface water and watercourses. I very much believe water authorities can be an example for other (local) governments and organisations, both within and outside the public sector and within and outside of the Netherlands.

"As Chair of the Managing Board of our bank, I am always proud to report on the progress the water authorities make regarding their sustainability ambitions and very much welcome our investors to come to the Netherlands to show what impact their investments have on the lives of Dutch citizens."

One of the bigger programmes the water authorities are working on, is the Flood Protection Programme (Hoogwaterbeschermingsprogramma). What can you tell us about that programme?

"The Flood Protection Programme (Hoogwaterbeschermingsprogramma, HWBP) is the largest dike reinforcement project since the Delta Works. Contrary to common belief, the Netherlands has not 'completed' this work – significant measures are necessary to manage increasing periods of water abundance and scarcity. The HWPB is an alliance of all the water authorities and the national government to keep the Netherlands safe. Half of the annual budget of €400 million comes from Rijkswaterstaat, the Ministry of Infrastructure and Water Management, while the other half is contributed by the water authorities. This financial input gives the water authorities influence, which is important because they have the best understanding of what each area needs. I'm proud to be able to finance such an important programme."

What do you think is the importance of reporting and what are the challenges?

"Sustainability, or ESG (Environmental, Social and Governance, red.) as we also call it, for me is about transparency on impact. Transparency results in a better understanding and thus a closer cooperation between our bank, our investors and our clients. That is what matters! An important milestone for us is that we have started reporting along the CSRD (Corporate Sustainability Reporting Directive), even if it is not clear whether our bank will be in scope of this regulation in the future. Water authorities as governmental bodies however are not in scope of the CSRD and therefore do not have to comply to the EU Taxonomy. I am happy that the water authorities nevertheless recognize the importance to report on their contributions and compliance with the EU Taxonomy. As a result, we can therefore present their important work in this Water Bond Report to our investors and we do this as much as possible in line with current and future regulation, guidelines and principles."

INTRODUCTION

'Nederland Waterland' is an expression often used in the Netherlands. Approximately 70% of the country's population resides in areas below sea level, and four major European rivers – the Rhine, Meuse, Scheldt, and Ems – flow through the country into the North Sea. In addition to these rivers, this small country has other waterways totalling around 250,000 km in length. Given this geography, the Dutch live with water on a daily basis. Living, working, doing business and recreation are only possible if the land is adequately protected from water and if water management is implemented correctly. The water authorities are primarily responsible for these essential tasks in the Netherlands. The water authorities are independent regional governments responsible for regional water management.

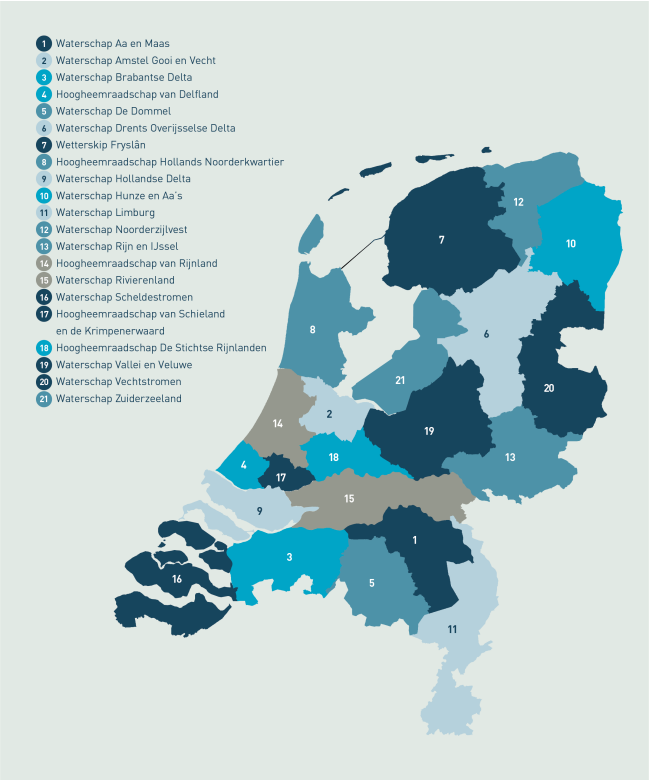
Water authorities are one of the four types of government organisations in the Netherlands, alongside the national government, provinces and municipalities. As their sole responsibilities are water protection and water management, they focus entirely on these tasks. There are 21 water authorities, each responsible for its own region. They provide flood defences, regulate water levels and quality, and manage sewage treatment.

On the right the map of the Netherlands is depicted, showing in which part of the Netherlands the various water authorities operate. The water authorities carry out their tasks using an extensive infrastructure, which consists mainly of:

- 18,000 km of flood defences, protecting the country from high water;
- 240,000 km of waterways, where the water authorities provide sufficient water of good quality;
- 5,900 pumping stations and tens of thousands of smaller engineering structures that enable the water authorities to drain water during wet periods and to ensure a sufficient water supply during dry periods;
- 313 sewage treatment plants, which enable water authorities to purify wastewater from households and businesses, allowing it to be safely discharged into surface water.

Challenges

In the era of climate change and increasingly variable weather conditions, water protection and management pose significant challenges for water authorities. The water authorities respond to these developments and their consequences in two ways. First, they are adapting their infrastructure to periods of extreme water abundance and scarcity so the Dutch can continue to live, work, do business and recreate with minimal disruption. This is what we call climate adaptation. Second, they are doing everything in their power to limit further climate change, which we refer to as climate mitigation. Examples of climate mitigation include generating as much energy as possible from sustainable sources, recovering raw materials and using reusable materials. In addition to working on climate adaptation and mitigation, the water authorities are committed to maintaining clean, ecologically healthy surface water. Through various measures in this area, they contribute to a healthy living environment and the improvement of



biodiversity. The remainder of this publication provides an overview of the water authorities and how they carry out their responsibilities.

Investments

The water infrastructure requires continuous investment to keep pace with developments such as climate change, land subsidence, urbanisation, industrialisation and increasingly strict environmental standards. The combined investment plans of the water authorities for the period 2024-2027 indicate that the average annual amount involved exceeds €2.7 billion. NWB Bank's Water Bonds play an important role in financing these efforts.

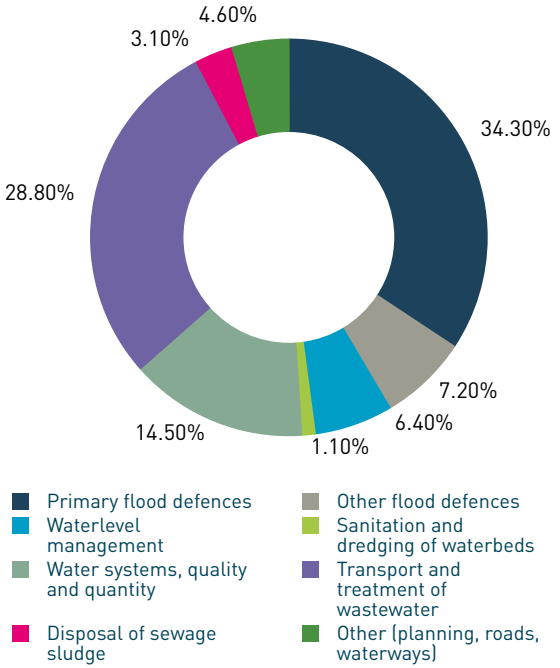
The table and piechart on the right show how the annual amount of investments is redistributed among the different tasks of the water authorities. Although providing budget financing, the money we lend to the water authorities may only be used to finance tasks that contribute to the six EU Taxonomy objectives. However, as can be concluded from the table, one task generally contributes to multiple objectives.

Average yearly investments 2023-2026	In million €	Contribution to EU taxonomy objective
Primary flood defences	935	1, 2, 4, 6
Other flood defences	195	1, 2, 4, 6
Waterlevel management	175	2, 3, 5, 6
Sanitation and dredging of waterbeds	30	1, 2, 3, 4, 5, 6
Water systems, quality and quantity	395	2, 3, 4, 5, 6
Transport and treatment of wastewater	785	1, 3, 4, 5, 6
Disposal of sewage sludge	85	1, 4
Other (planning, roads, waterways)	125	

Structure of this report

Both the Water Bond Framework and this newsletter are structured around the EU taxonomy objectives. The executive summary sums up the contribution per EU Taxonomy objective. In the remainder of this report, per chapter we highlight the EU Taxonomy objectives. We explain the most important activities that water authorities undertake to contribute to that objective. Next to that the progress made so far is substantiated by presenting the latest available key figures[1)] which are most often from 2022. Important to note however is that although our bank does strive for the highest possible market share in financing the water authorities, this share is not 100% but the impact presented in this report is nevertheless on sector level.

EXPECTED RELATIVE DISTRIBUTION OF THE BUDGET



1) The figures used in this publication are taken from 'Waterschapsspiegel' (https://www.waterschapsspiegel.nl/). On this website, the Association of Dutch Water Authorities regularly publishes an update of performance indicators. There is also a specific annual report about the water authorities' performance on sustainability which is called the 'Klimaatmonitor Waterschappen'.

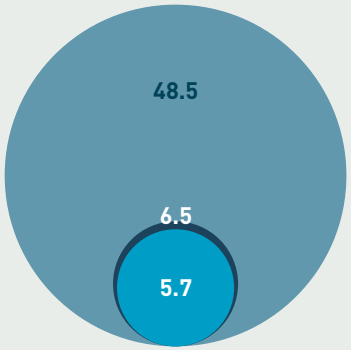
EXECUTIVE SUMMARY

IMPACT OF THE WATERBONDS

Total outstanding loans covered (2024)
8.9 billion
(RY 2023: 8.7 billion)

Emissions of water authorities, attributed to NWB in ton CO_2eq (2023)
508,463

Emission intensity financed by NWB in ton CO_2eq (2023)
60.7 of which
Scope 1: 48.5
Scope 2: 5.7
Scope 3: 6.5



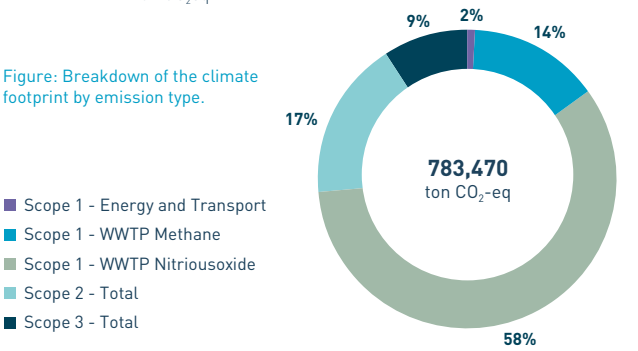
IMPACT MADE BY THE SECTOR

Climate change mitigation

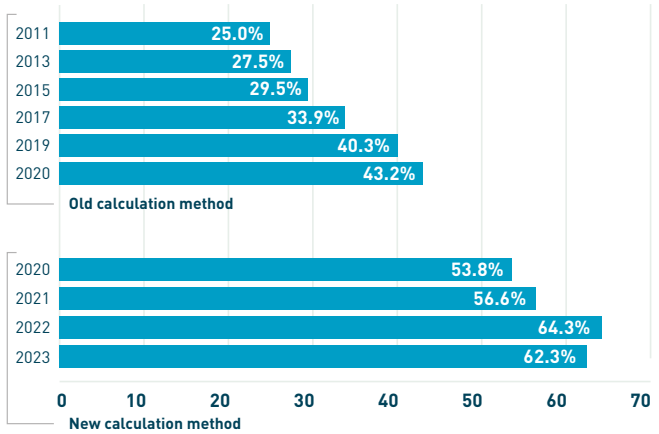
Emissions are limited as much as possible (CO_2eq footprint), next to that as much as possible renewable energy is generated or purchased. The increase in 2021 has mainly an administrative cause: purchased energy from Europe has not qualified as renewable since 2021, regardless of how it was generated. The footprint decreased by 27% in 2023 compared to 2022[1].

	2015	2017	2019	2020	2021	2022	2023
Water authorities' climate footprint in ton CO_2eq	1,119	1,123	982	932	1,101	1,079	783

Figure: Breakdown of the climate footprint by emission type.



Water authorities' share of own production in total energy use



Most important source of the own energy production is the biogas from the 'sludge' produced out of the wastewater treatment process (+- 66%). Other natural sources include wind, solar, hydroelectric and geothermal and aquathermal energy (heat and cold).

Climate change adaptation

The water authorities are making the flood defences and the water systems they manage more climate-proof. On 1 January 2017, a new safety standard was introduced for primary flood defences. Taking the new standards into account, the goal is to have the flood defences reach 100% compliance by 2050.

KPI	2023	2050 target
Percentage primary and regional flood defences (km) reviewed/compliant	68%	100%
Number of hectares that do not meet flooding standards	0.31%	0%

1) Reduction partly caused by adjustment in methodology, please see for details the GHG Emissions report on our website.

Transition to a circular economy

The performance of some core activities of water authorities generate large quantities of residuals, which are reused where possible.

Activity	Residual	Reusable material	2022	2023
Waterway maintenance	Biomass	Paper/composite		
Wastewater treatment	Purified wastewater	Freshwater source	13.6 mln m³	10.1 mln m³
	Phosphate	Fertiliser	119 ton	108 ton
	Cellulose	Paper/cardboard	4,691 ton	3.461 ton
	Kaumera	Cement binder/glue	4 ton	1 ton

Pollution Prevention and Control

With wastewater treatment plants, water authorities remove the most harmful substances (nitrogen, phosphorus and oxygen-binding subsstance) out of the wastewater of the 18 million inhabitants and more than 2 million companies in the Netherlands. The quality of wastewater treatment is high in relation to the standards and continues to improve.

Percentage of substances removed from wastewater	2013	2015	2017	2019	2021	2022	2023
Nitrogen (norm: 75%)	83.9%	83.4%	84.2%	85.2%	84.5%	85.8%	83.7%
Phosphorous (norm: 75%)	84.7%	85.3%	86.2%	86.7%	86.9%	87.3%	85.7%
Oxygen-binding substances (norm: 90%)	92.5%	92.6%	92.7%	92.6%	92.8%	93.2%	92.1%

Sustainable use and protection of water

Water authorities are responsible for the quality of water in the systems they manage. The European Water Framework Directive (WFD) sets minimum water quality objectives that must be met by 2027[1].

	2022	2023	Impact results
Quality of surface water - % surface waters WFD targets achieved	0%	0%	0%-pt
Quality of surface water – Biological status (WFD Targets)	14.0%	14.1%	0.1% -pt
Quality of surface water - Ecological status (WFD Targets)	0%	0%	0%-pt
Quality of surface water – Chemical status (WFD Targets)	4.1%	4.6%	0.5%-pt

1) Interim evaluation of the water framework directive, see website for details.

Protection and restoration of biodiversity

Biodiversity is declining in the Netherlands, and climate change is expected to cause further loss of biodiversity. Biodiversity is extremely important to water authorities. Since 2020, water authorities have been partners the Delta Plan for Biodiversity Recovery.

Water authorities perceive themselves as both socially responsible and uniquely positioned to enhance biodiversity. The Biodiversity Framework 2.0 supports this role by providing tangible biodiversity objectives and actionable guidance for policy and management. Through use of critical performance indicatiors (KPIs) and goal-based stewardship, the framework enables authorities to gain practical experience in biodiversity restoration. The new framework was published in December 2024. As soon as data are available, we will publish the results.

CONTRIBUTION TO EU TAXONOMY OBJECTIVES

- Climate change mitigation
- Climate change adaptation
- Sustainable use and protection of water
- Transition to a circular economy
- Prevention pollution and control
- Protection and restoration of Biodiversity and ecosystems

2

CLIMATE CHANGE MITIGATION

DUTCH CLIMATE POLICY

Following the Paris Climate Agreement, the Netherlands tightened its climate and energy policy. This resulted in the 2019 National Climate Agreement, in which governments, businesses and civil society organisations agreed to reduce greenhouse gas emissions by 49% by 2030 compared to 1990 levels. In July 2023, the Netherlands raised the bar even higher by adopting the Climate Policy Programme, which aims to reduce CO_2 emissions by 60% by 2030. The programme aims to significantly cut emissions and accelerate the transitions needed to achieve climate neutrality. As part of the Climate Policy Programme, the national government, municipalities, provinces, and water authorities have agreed to address the climate challenge. These agreements, titled 'Shoulder to shoulder for the climate', outline how they will collaborate and coordinate efforts, and specify the responsibilities of each party in reaching the shared climate goals.

Sustainable energy use

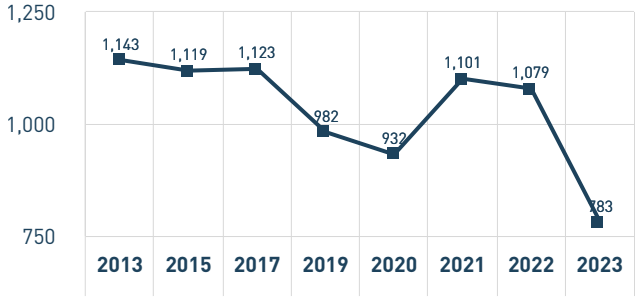
Water authorities observe the adverse effects of climate change in their daily work. They are taking preventive measures to adapt their infrastructure and limit these effects as much as possible. However, they are also taking measures to combat further climate change, a process known as climate mitigation. These measures can be divided into contributions to the energy transition and the circular economy, i.e. closing loops. Chapter 6 focuses on the actions taken by the water authorities in the context of the circular economy. This chapter discusses the measures taken by water authorities in relation to the energy transition. The ambitions of the water authorities go beyond the targets agreed in the Netherlands under the Paris Climate Agreement: they want to be climate neutral by 2035. The annual Water Authorities Climate Monitor, published by the Association of Water Authorities together with NWB Bank, provides insight into the progress made in achieving this ambition.

CO_2 equivalent footprint

By mapping out their CO_2 equivalent footprint, the water authorities show the impact of their activities on the natural living environment. The smaller the CO_2 footprint, the smaller the negative effects of the water authorities' greenhouse gas emissions. The table below illustrates the evolution of the CO_2 footprint from 2013 to 2023[2].

The footprint decreases until 2020 and increases from 2021 onwards. The cause of this increase is mainly administrative. As of 2021, energy purchased from Europe no longer qualifies as sustainable, regardless of its production method. In 2023, the footprint decreased by 27% compared with 2022.

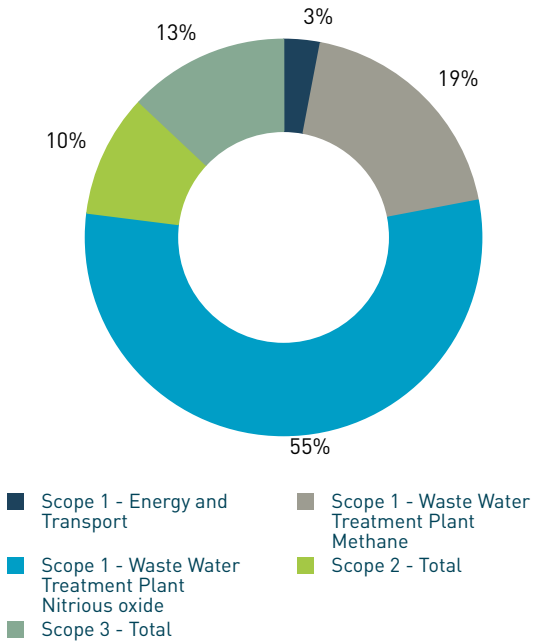
WATER AUTHORITIES' CO_2 FOOTPRINT DEVELOPMENT IN TON CO_2 EQ



2) Data from before 2013 is not available.

The following figure illustrates which activities were responsible for which part of the climate footprint in 2022.

DISTRIBUTION OF CO_2 FOOTPRINT BY TYPE OF EMISSION[1)]



1) Scope 1: includes direct emissions resulting from operational activities.
Scope 2: covers indirect emissions from purchased or self-generated energy.
Scope 3: includes other indirect emissions, such as those from employees commuting to and from companies working on behalf of the water authorities.

In 2023, the footprint of the water authorities totalled 783 kilotons of CO_2, equivalent to the emissions of approximately 100,000 households. The following figure illustrates the proportion of the CO_2 footprint attributable to each activity. It reveals that methane (19%) and nitrous oxide (55%) are the main sources of greenhouse gas emissions for the water authorities. The water authorities are undertaking many initiatives to reduce these emissions, which primarily occur during wastewater treatment. The impact of these efforts is expected to be visible in future figures. These activities stem from the 'On the road to climate neutrality' vision adopted by the water authorities in 2022.

SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all

7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

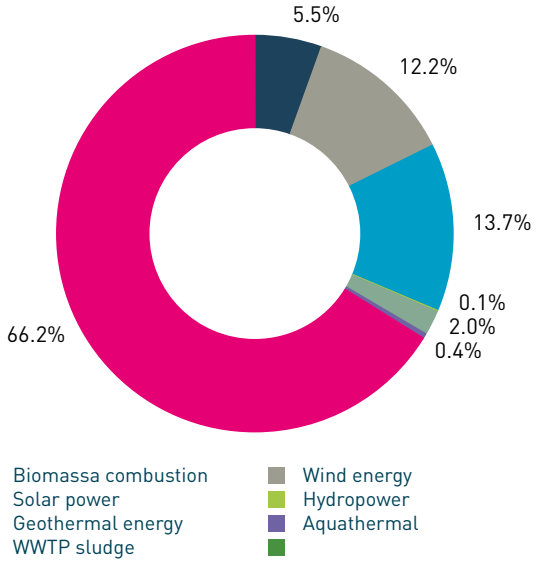
Self-generated energy

In addition to purchasing almost exclusively renewable energy, the water authorities also generate as much renewable energy as possible through their own operations, particularly as part of their wastewater treatment activities. Biogas is the most important source of renewable energy.

Sources of renewable energy generation

In 2023, biogas accounted for the largest share (66.2%) of total renewable energy generated by water authorities. However, shares from other natural sources, such as wind (12.2%) and solar (13.7%), are growing. Sources such as hydropower and energy from the ground and water contribute modestly to the water authorities' renewable energy generation activities. The following chart illustrates the proportion of each source in the water authorities' renewable energy production throughout 2023.

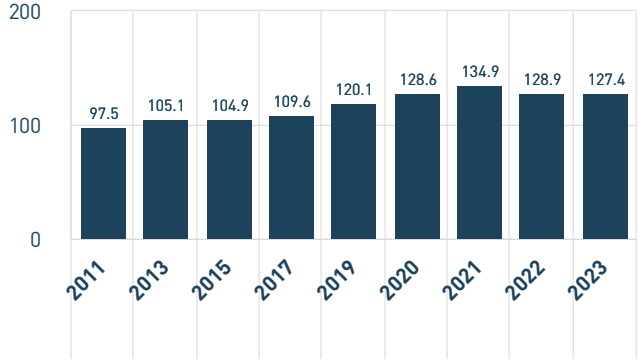
DISTRIBUTION OF WATER AUTHORITIES' OWN ENERGY PRODUCTION IN 2023 BY SOURCE



Biogas production

The treatment of wastewater produces a by-product known as 'sewage sludge'. This sludge can be used to produce biogas through through the decomposition of organic materials. This biogas can then be used as a direct energy source for transportation and vehicles, as well as to generate electricity. The 21 water authorities together are among the largest producers of biogas in the Netherlands. The graph below shows the amount of sewage sludge processed and the volume of biogas produced by the water authorities, as well as how it has been put to beneficial use.

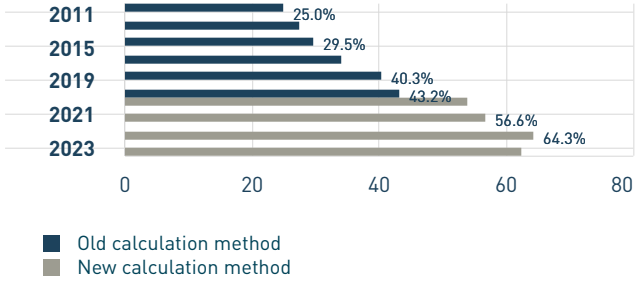
VOLUME OF BIOGAS PRODUCED AND PUT TO GOOD USE (IN MILLIONS OF M3)



Share of self-generated energy

The water authorities aim to achieve energy neutrality by 2025. This means that the total amount of renewable energy generated by the water authorities themselves, along with the energy produced by third parties on their premises, must be equal to or greater than their total energy consumption. As an intermediate target, they aimed to generate 40% of their energy needs sustainably by 2020. As shown in the table below, this target was achieved in 2019.

SHARE OF OWN PRODUCTION IN TOTAL ENERGY USE



However, due to a technical change in the calculation method, the figures up to and including 2019 are not comparable with those from subsequent years. According to the current calculation method, the proportion of self-generated renewable energy was 62.3% in 2023, compared to 64.3% in 2022.

Water authorities often make sites they manage available to third parties, such as community cooperatives and businesses, for the generation of renewable energy. In 2023, the amount of energy produced by third parties on water authority sites was equivalent to 11.3% of the total energy consumption of all water authorities combined. In 2022, it was 12.3%.

WIND TURBINES OF THE RIJN AND IJSSEL WATER AUTHORITY

Located in the eastern part of the Gelderland province, the Rijn and IJssel Water Authority aims to be energy neutral by 2025. To contribute to this goal, the water authority has installed two large wind turbines at its largest wastewater treatment plant in Duiven. With blade tips reaching a height of over 200 metres, these wind turbines generate approximately 24 million kWh of electricity per year. This is equivalent to the annual energy consumption of around 9,000 households.

The turbines are connected to the same electricity supply as the wastewater treatment facility. As a result, some of the generated electricity can be used directly to meet its own energy needs. The remainder is fed into the public electricity grid and used by households and businesses. The two wind turbines reduce the water authority's CO_2 emissions by 12,800 tonnes each year.

Prior to installation, there was significant opposition from local residents, who were concerned about potential disturbance. In consultation with the community, the water authority introduced several measures to minimise disturbance. For instance, low-noise blades were used, and the lighting was fitted with dimmers to reduce light pollution. The turbine settings also limit the cast shadow of the blades as much as possible. Finally, residents living in the vicinity receive 20% of the financial return generated by the turbines for the water authority.

PRODUCTION OF GREEN GAS AND LIQUID CO_2 BY THE DOMMEL WATER AUTHORITY

Located in the south-eastern part of the province of North Brabant, the Dommel Water Authority has built a facility at its wastewater treatment plant in Tilburg that upgrades biogas released during the digestion of sewage sludge into green gas. This renewable energy product is sold on the market. The facility produces 6 to 7 million cubic metres of green gas each year, equivalent to the gas consumption of around 4,500 households.

Biogas from sludge digestion consists mainly of methane and CO_2. During the production of green gas, the CO_2 is filtered out of the biogas, increasing the methane content to 86% and giving the gas the same quality as fossil natural gas. Typically, the separated CO_2 would be released into the atmosphere, but at this site, the Dommel Water Authority has chosen to capture and compress the CO_2 into liquid form using a second installation. This liquid CO_2 is also sold as a useful product. Around 3,000 tonnes of CO_2 are captured each year that would otherwise be emitted into the atmosphere.

CLIMATE CHANGE ADAPTATION

REINFORCING WATER DEFENCES AND ADAPTING WATER SYSTEMS

The effects of climate change are visible all over the world. At the end of October 2024, a natural disaster of unprecedented scale unfolded in the Spanish region of Valencia. Heavy rainfall caused catastrophic flooding and widespread destruction to buildings, infrastructure and transport networks, resulting in many deaths.

The Netherlands is also experiencing higher temperatures, greater chances of dry periods and, at the same time, heavier rainfall. This is causing higher water levels in rivers and other waterways, as well as lower groundwater levels. Following the dry years of 2018, 2019, 2020 and 2022, 2023 was exceptionally wet, with a record amount of precipitation: 1,160 mm compared to the normal amount of 850 mm. The changing climate poses risks to our safety, health, environment and economy. Water authorities are making the flood defences and water systems they manage as climate-proof as possible to limit the consequences of extreme weather.

Without sturdy flood defences, two-thirds of the Netherlands would regularly flood. This area, home to over 10 million people and accounting for around 70% of the national income, lies below sea level. Floods endanger people's safety, damage buildings and infrastructure, and disrupt the economy.

The water authorities manage and maintain about 18,000 km of flood defences:

- 3,200 km of primary flood defences: primary flood defences are those that provide protection against flooding from the sea, major rivers and the IJsselmeer and Markermeer lakes and must meet a statutory safety standard;
- 10,700 km of regional flood defences: together with the 12 provinces in the Netherlands, water authorities determine which non-primary flood defences are so important that they must meet a safety standard;
- 4,000 km of other flood protection systems: flood defences that are not designated as primary or regional flood defences are not provided with a safety standard because they play a minor role in water safety and mainly have a function in the water system.

Flood protection

Strengthening primary flood defences

In 2017, new, stricter safety standards were introduced, with which the primary flood defences must comply by 2050. The total length of primary flood defences is divided into 216 standard sections, each with its own tailored

standard based on the area it protects. Between 2023 and 2027, the water authorities will assess all primary flood defences, as well as the locks and pumping stations within them, in accordance with the new safety standards. Failure to meet the standard does not necessarily indicate an immediate risk of flooding, but it does mean that the flood defence must be reinforced in the short term. By starting these reinforcements now, the water authorities are ensuring that the flood defences will be ready for the expected situation in 2050.

The reinforcement of the water authorities' primary flood defences is taking place as part of a national flood protection programme (*Hoogwaterbeschermingsprogramma*, HWBP). This joint programme between the water authorities and the national government was launched in 2014. The water authorities and the national government are jointly

financing the programme and made €450 million available in 2023. Between 2014 and 2023, 219 km of dykes were reinforced under the HWBP. Between 2023 and 2024, the results of assessments of primary flood defences were analysed in more detail. This led to the conclusion at the end of 2024 that approximately 1,400 km of primary flood defences will need to be reinforced by 2050.

Strengthening regional flood defences

In addition to the 3,200 km of primary flood defences, the water authorities manage a further 14,800 km of flood defences to protect the country from flooding. The provinces determine which sections of these defences are important enough to be designated as regional flood defence areas and subject to safety standards. By the end of 2023, this applied to 10,700 km. Regional flood defences that do not meet the standard must naturally be reinforced within the foreseeable future. Defences not designated as either primary or regional are not subject to safety standards, as they play only a limited role in water safety and mainly support the regional water system.

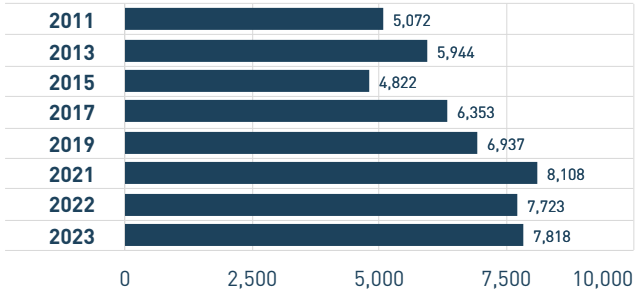
The provinces establish safety standards for regional flood defences, which water authorities use to assess whether the defences provide adequate protection. Separate agreements are made between the water authorities and the provinces. This means that assessments are not carried out simultaneously across the country. If an assessment finds that sections of regional flood defences fall short of the standard, the relevant water authority and province will agree on a timeline for reinforcement. The situation regarding regional flood defences on 31 December 2023 can be summarised as follows:

- 98% of the kilometres of the flood defences with a safety standard had been assessed in accordance with the applicable standards (2022: 96%);
- 87% of these 'standardised kilometres' complied with the applicable standards (2022: 86%);
- In 2023, the water authorities reinforced a total of 95 km of regional flood defences.

As shown in the following table, the proportion of regional flood defences meeting the standard has increased since 2011. However, it has occasionally declined due to the introduction of stricter requirements over time.

REGIONAL FLOOD DEFENCES THAT MEET THE SAFETY STANDARD

in kilometers



Prevent flooding and water shortages: optimising water systems

Water authorities ensure there is sufficient, high-quality water in a given area. This means not too much water, but not too little either. Different functions require different water levels, including agriculture, nature conservation, urban areas, recreation, flood defence stability, salinity prevention, drinking water extraction, industry, shipping and fisheries. The water authorities optimise their systems in response to changing conditions, including climate change. This can involve creating water storage areas and increasing the capacity of existing water systems and pumping stations. They do this in consultation with and in collaboration with partners in their areas. Together, they seek to strike a balance between water supply, drainage and retention.

Flood prevention

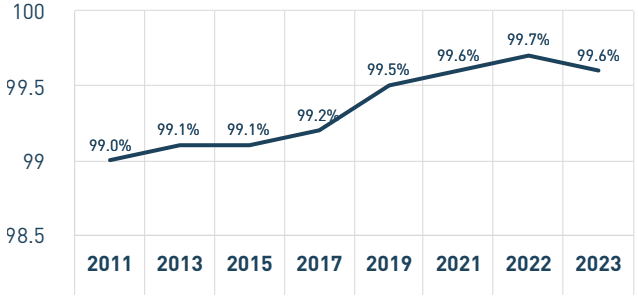
In the Netherlands, approximately 50% of the land is kept dry with the help of pumping stations. This is necessary because the water in these areas does not naturally drain away. If water is not drained from an area quickly enough, or at all, flooding occurs for the people who live and work there. Following serious flooding in various parts of the Netherlands, the first national agreements were established in 2003 through the *Nationaal Bestuursakkoord Water* (National Administrative Agreement on Water), aimed at preparing the country for different circumstances. As part of these agreements, the provinces set standards for each water

authority area to prevent 'unacceptable flooding' as much as possible. The water authorities then took measures to ensure their areas complied with these standards. Due to climate change, particularly increased rainfall, the flooding challenge is expected to intensify in the coming years. As shown in the following table, the proportion of water authorities' management areas that meet the standards has increased in recent years.

Preventing water shortage

Before 2018, the Netherlands experienced an extended period with little precipitation, which was highly unusual; the last time this occurred was in 1976. However, the exception now seems to have become the rule: long, dry summers were experienced in 2018, 2019, 2020, and 2022, resulting in water shortages in certain parts of the Netherlands, despite the country's water-rich status. This was particularly the case in areas with sandy soils that cannot retain much water, where supplying water is also very difficult. These areas are mainly located in the east and south of the country.

PERCENTAGE OF SURFACE WATER MANAGEMENT AREAS MEETING STANDARDS



Water shortages lead to lower water levels in rivers and other watercourses, as well as lower groundwater levels. This can have major negative consequences for nature and agriculture due to the salinisation of the subsoil. It can also affect shipping, the stability of flood defences and buildings, and drinking water supplies. Retaining, storing and supplying water are therefore increasingly important tasks for water authorities, helping to prevent such problems. In the east and south of the Netherlands, the nature of the high sandy soils makes it difficult for water authorities to supply water during periods of shortage. During dry periods, the situation is often exacerbated by private individuals and businesses extracting more groundwater. It is therefore particularly important for water authorities to retain and buffer more water for dry periods.

THE VALLEI EN VELUWE WATER AUTHORITY SUPPLIES KAUMERA TO REINFORCE DIKES

At its sewage treatment plant in Epe, located in the province of Gelderland, the Vallei en Veluwe Water Authority is extracting the raw material Kaumera from wastewater. This substance contains natural materials such as proteins, sugars, potassium, nitrogen and phosphorus. The neighbouring Rijn en IJssel Water Authority is currently trialling it to determine its effectiveness in strengthening dikes when added to the soil.

In 2024, the water authorities of Vallei en Veluwe, Rijn en IJssel, De Stichtse Rijnlanden and Limburg formed a cooperative to accelerate the development of Kaumera. The water authorities are involved in producing Kaumera, and a new start-up has been established to market the raw material. This is a major step forward for Kaumera.

Adding Kaumera to the base of a dike creates a more solid top layer on which grasses and herbs can grow. The trial will investigate whether this also makes the dike more resistant to high water. An additional advantage is that improved grass and herb growth attracts more insects and other animals, promoting biodiversity.

TIDAL REGULATION AT THE ROPTA PUMPING STATION REDUCES ENERGY CONSUMPTION AT WETTERSKIP FRYSLÂN

The Terwolde sewage treatment plant of the Vallei and Veluwe Water Authority in the province of Gelderland was built in 1977 and last underwent a major renovation in 1988. To ensure that the plant continues to function properly, it is now due for a further renovation. This renovation will be as circular and sustainable as possible. For example, the pipe bridge will be made of wood, the sludge tanks will be deepened and the modular Verdygo® concept will be used.

The plant will be the first wooden pipe bridge to be built at a wastewater treatment plant in the Netherlands. In fact, during the design phase it was found that a pipe bridge made of wood has a significantly lower environmental cost indicator (EQI) than steel. This is because wood absorbs CO_2 and there are virtually no pollutants released during its production and processing. The wood used is FSC certified and produced under good social conditions. The choice of a wooden pipe bridge resulted in a € 200,000 reduction in the ECI.

Another example of sustainability is the sunken construction of the sludge tanks. This eliminates the need to pump the wastewater, which saves energy; the released soil can be used elsewhere in the treatment plant; and the tanks are two metres lower, which means less material is used. The choice of a sunken design resulted in energy savings of 2,300 MWh over the 30-year life of the plant.

The treatment plant also used Verdygo®, an innovative modular design and construction concept. Unlike traditional wastewater treatment plants, Verdygo® plants are made of standardised above-ground modules that are connected together on a plug-and-play basis. This means that when a plant or part of a plant is decommissioned, the modules can be used elsewhere. Verdygo® modules can be reused in places where traditional, mostly concrete, plants have to be demolished.

SUSTAINABLE USE AND PROTECTION OF WATER

MEASURES IN SURFACE WATER

The water authorities are also responsible for water quality in the water systems they manage. They do this by:

1. Treating wastewater (see Taxonomy objective Pollution Prevention); and
2. Taking various measures that contribute to clean and ecologically healthy surface water[1].

This chapter looks at the measures that water authorities take in water systems to achieve clean and healthy water. Examples of measures that water authorities take in their water systems to improve water quality include ecological maintenance and mowing management, construction of nature-friendly banks, stream regrading, stream restoration and construction of fish passages.

1) Surface water in the Netherlands is all the water above the ground: the water in rivers, ditches, canals, lakes etc.

The European Water Framework Directive (WFD) is important, as it sets minimum water quality objectives for larger water bodies that must be met by 2027. In the Netherlands, water authorities manage about 660 out of more than 700 'WFD water bodies'. The challenge to meet the agreed targets in 2027 is huge, due to the still relatively high levels of pesticides, fertilisers, heavy metals and other (chemical) substances in the water, but also due to the design of many water bodies.

According to the WFD, the ecological status of surface water bodies consists of the biological status, the physico-chemical and hydro-morphological elements in the surface water body. Ecological status is poor if any of the above elements do not achieve the status of 'good', following the principle of 'one out, all out'. The ecological status of surface water bodies meets sufficient standards at all locations in the Netherlands. There are water bodies where the biological status is 'good', but if one of the physiochemical or hydro-morphological elements of the water body fails to achieve a'good' status, the ecological status is insufficient.

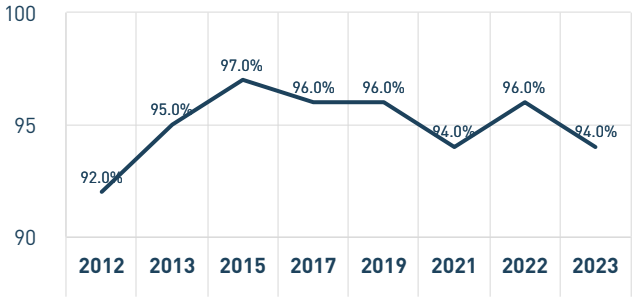
In the first impact-measurement of NWB Bank, a nature quality index was used to assess the quality of aquatic nature, alongside progress towards the ecological and chemical objectives of the WFD. As of 2022, the WFD sub-objectives are added to the impact measurement, i.e. progress on biological quality of surface waters. The biological quality measurements and the nature quality index mentioned above are closely related, as they both (partly) cover the quality of macrofauna and aquatic flora, and both use the quality standards (framework) of the WFD as a reference.[3]

	2022	2023
Quality of surface water - % surface waters WFD targets achieved	0.0%	0.0%
Quality of surface water – biological status (WFD Targets)	14.0%	14.1%
Quality of surface water – Ecological status (WFD Targets)	0.0%	0.0%
Quality of surface water – chemical status (WFD Targets)	4.1%	4.6%

There are 740 official swimming locations in outdoor waters in the Netherlands, with 500 managed by the water authorities and the remainder managed by Rijkswaterstaat. While the provinces are ultimately responsible for the safety of these locations, the water authorities play a crucial role in ensuring the water quality of the 500 locations within their jurisdiction. To protect the health of swimmers, the water authorities regularly monitor bathing water quality during the swimming season (1 May to 1 October). If health risks are identified, the water authorities advise the provinces on issuing warnings (at 191 locations in 2023), providing negative swimming advice (at 75 locations in 2023), or implementing swimming bans (at one location in 2023).

3) Interim evaluation Water Framework Directive: https://open.overheid.nl/documenten/dpc-7c016640aa2cfd17d6b4259834d61d2acaa90f52/pdf

PERCENTAGE OF BATHING WATER SITES MANAGED BY WATER AUTHORITIES THAT COMPLY WITH THE EUROPEAN BATHING WATER DIRECTIVE



Reduced water quality, which can occur especially at higher temperatures, has many potential causes. The leading causes are bird and animal faeces, as well as possible sewer system overflows. If measures need to be taken to improve bathing water quality, these will be implemented in collaboration between the water authority, the site manager and the province (23 times in 2023). Information on the current quality of bathing water at various locations in the Netherlands can be found at https://www.zwemwater.nl/ and via the 'Zwemwater app'.

One indicator of the quality of surface water is the proportion of bathing water locations that comply with the European Bathing Water Directive. In 2023, 94% of locations managed by the water authority consistently met the requirements of the directive. The graph above shows the figures since 2012.

IMPROVEMENT OF WATER QUALITY IN THE LEIGRAAF BY THE RIVIERENLAND WATER AUTHORITY

The Leigraaf is a meandering stream that flows through the town of Groesbeek, situated in the area managed by the Rivierenland Water Authority. This water authority spans four provinces, with its primary location in Gelderland and South Holland. It is carrying out various works on the stream to improve its ecology, which will result in better water quality, improved water retention, easier passage for fish and simpler maintenance of the stream in future.

One of the reasons the water authority is working on the Leigraaf is to meet the objectives of the Water Framework Directive (WFD). The WFD is European legislation designed to ensure that surface water throughout the EU remains clean and healthy. To help achieve this, it is essential that fish can swim freely without encountering obstacles; therefore, the water authority has installed a fish lift. Rivierenland is also working to restore the Leigraaf's natural flow, a process known as meandering. During dry periods, this helps maintain groundwater levels and improves water retention. As a result, water infiltrates more slowly into the soil, replenishing the groundwater. In wetter periods, meandering helps slow down the flow of water, reducing erosion and the loss of sand.

TRANSITION TO A CIRCULAR ECONOMY

RECOVERING RAW MATERIALS

The demand for raw materials is rising due to the rapidly growing world population and increasing prosperity. Scarce materials are becoming depleted, and extracting and using them often has a negative environmental impact. Therefore, it is essential that we explore new methods of production and consumption to enable the reuse of raw materials. Water authorities are contributing to this by committing to the principles of the circular economy. In a circular economy, waste is eliminated, and raw materials are continually reused. This also helps to slow down climate change, as there are fewer CO_2 emissions. In the Netherlands, various parties, including water authorities, have signed a raw materials agreement (*Grondstoffenakkoord*) aimed at achieving a 100% circular economy by 2050. The water authorities have also set an intermediate target of using 50% fewer primary raw materials with a negative environmental impact by 2030. They are also committed to recovering raw materials released during the management and maintenance of their infrastructure, as well as from the sewage they treat.

For the water authorities, 'circular operations' means taking into account the life span, renewability and environmental impact of materials from design through to implementation and management. In this context, they impose requirements on the products used by contractors performing work on their behalf. The water authorities have significant means and opportunities to make a real difference in this area, as they purchase more than €4 billion worth of products and services on the market each year. As part of the *Strategie Duurzaam Opdrachtgeverschap 2021-2030* (Sustainable Commissioning Strategy 2021–2030), the water authorities set requirements for the materials used by contractor – for example, using as few environmentally harmful or scarce raw materials as possible – and for the equipment deployed, such as prioritising electric machinery and trucks. The strategy encourages water authorities to use their role in the project chain to contribute to sustainability.

Extracting raw materials from wastewater

The wastewater treated by the water authorities is also a source of raw materials. Intensive research has been conducted into the possibilities of recovering usable substances from the water treatment process. At some locations, recovery is already taking place in so-called raw material factories. These include phosphate, cellulose, bioplastics, fatty acids and Kaumera; however, the most important raw material is the purified water itself. The concrete results achieved to date are indicated below.

Purified sewage water

Due to the ever-increasing demand for freshwater, partly as a result of increasingly frequent periods of drought, water authorities' sewage treatment plants are increasingly becoming freshwater factories. Purified sewage water is an important source of freshwater, especially in summer, and is used for purposes such as preventing drought and industrial applications. In 2023, the water authorities supplied 10.1 million m^3 of purified sewage water as a raw material (in 2022, this figure was 13.6 million m^3).

Phosphate

Phosphorus is an important fertiliser that occurs in sewage water in the form of phosphate. It can be recovered from sewage water in the form of struvite, a highly fertile fertiliser, or from the ash remaining after sewage sludge incineration. In 2023, seven water authorities recovered a total of 108 tonnes of phosphate (compared to 119 tonnes recovered by eight water authorities in 2022).

Cellulose

Using toilet paper in particular results in high levels of cellulose in sewage. Cellulose can be recovered by filtering the sewage through special installations. The cellulose fibres can then be used to make paper or cardboard. In 2023, three water authorities recovered a total of 3,461 tonnes of cellulose (in 2022, three water authorities recovered 4,691 tonnes).

Kaumera

A certain type of sewage treatment known as the 'Nereda purification process' produces sludge granules. These granules can be used to produce a new raw material called Kaumera. Kaumera can be used as a binding and adhesive agent in the concrete industry or as a water-repellent coating in agriculture and horticulture. The world's first Kaumera extraction plant opened in Zutphen in 2019, followed by a second plant in Epe in 2021. In 2023, these two plants extracted one tonne of Kaumera (compared to four tonnes in 2022).

EXTRACTING CELLULOSE FROM WASTEWATER BY DE STICHTSE RIJNLANDEN WATER AUTHORITY

Hoogheemraadschap De Stichtse Rijnlanden is a water authority primarily based in the province of Utrecht. It aims to operate as sustainably as possible. As part of this commitment, the water authority has constructed a facility at its Leidsche Rijn sewage treatment plant, located near the city of Utrecht, which recovers cellulose from the screenings removed from the wastewater. By selling the recovered cellulose, the water authority is closing the loop for this raw material.

Cellulose in wastewater is the residue of toilet paper, which arrives at the sewage treatment plant in the form of small fibres. The cellulose recovery plant has the capacity to produce at least 550 tonnes of cellulose per year. This raw material is already being used as an additive in the construction of asphalt roads. Furthermore, De Stichtse Rijnlanden is collaborating with industry partners to explore the potential of using cellulose as an ingredient in biocomposites. These materials can be used to create panels for façade cladding and bank revetment.

Capturing and recovering cellulose is a technically and financially attractive way to make existing sewage treatment plants more sustainable and partly circular. This process optimises the treatment plant's capacity, reduces electricity consumption, and generates less sewage sludge as a byproduct. An additional advantage is that the water treatment plant becomes less susceptible to blockages. When 550 tonnes of recovered cellulose are converted into a reduction in the water authority's carbon footprint, this equates to 1,100 tonnes of CO_2 per year.

PREVENTION AND CONTROL OF (WATER) POLLUTION

SEWAGE TREATMENT

The water authorities operate 313 sewage treatment plants to remove harmful substances from wastewater discharged by residents and businesses into the sewer system, as well as from other sewage water added by precipitation. Through this treatment process, the water authorities ensure that the wastewater is cleaned to such an extent that it can be discharged into surface water without adversely affecting its quality.

Wastewater treatment, therefore, contributes to the quality of surface water, a topic discussed in Chapter 5. Furthermore, sewage treatment plants are also referred to as energy and raw material factories because water authorities use wastewater to generate sustainable energy and recover raw materials wherever possible. These topics are discussed in Chapters 3 and 6.

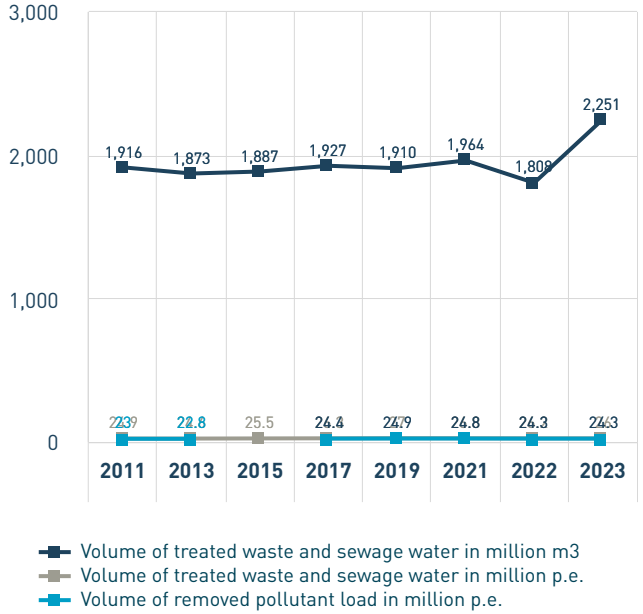
An important part of achieving good water quality is high standards of wastewater treatment. The removal of oxygen-binding substances and nutrients, such as phosphorus and nitrogen from wastewater is essential to maintaining healthy surface water bodies. The European Directive on urban wastewater treatment, Council Directive 91/271/EEC, states that at least 80% of the present phosphorus and at least 70%-80% of the present nitrogen must be removed. Undeniably, it would be best to remove 100% of these substances, as this would mean that our wastewater would not add any harmful substances or nutrients to our environment. At present, wastewater treatment plants easily meet the targets set by the European Directive, with percentages ranging from 84 to 92%.

The following graph shows how much wastewater and sewage has been treated by the water authorities in recent years, and how much pollution has been removed. Pollution load is expressed in terms of population equivalents (p.e.). One p.e. corresponds to the pollution load of one inhabitant of the Netherlands per year. In total, the water authorities treated 2.25 billion m^3 of wastewater and sewage in 2023. This figure was 1.81 billion m^3 in 2022. As the average is two billion m^3, this suggests that 2023 was a very wet year and 2022 a very dry year.

Removal of harmful substances

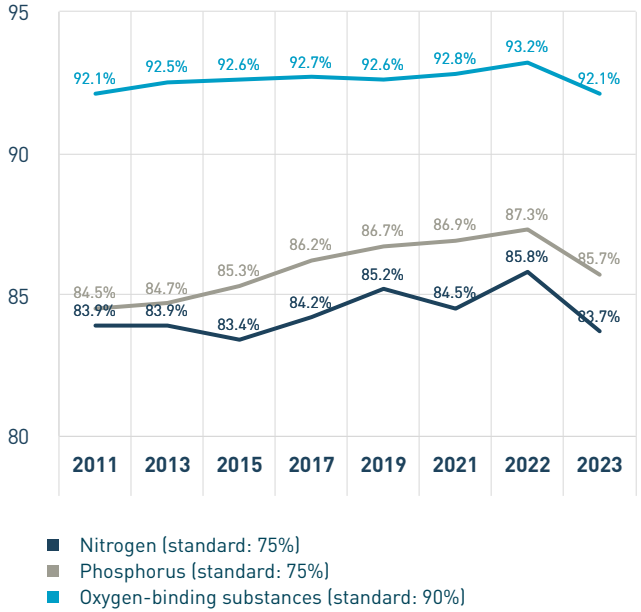
The water authorities remove substances that are most harmful to surface water from wastewater, such as nitrogen, phosphorus, and oxygen-binding substances. Nitrogen and phosphorus are two nutrients which, when present in excessive concentrations in surface water, lead to algae growth. This has an adverse effect on aquatic plants and particular species of fish that require clear water to survive, especially in stagnant water. The removal of oxygen-binding substances is also important because, in high concentrations, they reduce the amount of oxygen available to plants and animals.

SHARE OF SUBSTANCES REMOVED FROM WASTEWATER



European regulations stipulate that at least 75% of nitrogen and phosphorus must be removed from wastewater. While there are no regulatory requirements for the removal of oxygen-binding substances, in the Netherlands, it is generally accepted that at least 90% should be removed from wastewater. The graph on the right demonstrates that wastewater treatment quality consistently exceeds the required standards and has improved on average over the past 10 years.

QUALITY OF WASTEWATER TREATMENT



The lower proportion of substances removed in 2023 compared to previous years is attributed to the fact that 2023 was an exceptionally wet year. In wet years, wastewater is significantly diluted by rainwater, and diluted water is much more difficult to treat than concentrated wastewater.

Other substances in wastewater

Microplastics, medicines, drugs and COVID-19

In recent years, an increasing number of other harmful substances have been found in wastewater. This is partly because the composition of substances discharged by residents and businesses into the sewer system changes over time, and partly because monitoring is becoming more extensive.

Examples of these substances include microplastics, which are found in modern detergents, shampoos and shower gels, as well as medicine and drug residues that end up in the sewer system through toilets.
If such substances are found to be harmful to the environment or public health, new monitoring techniques are developed to better understand their harmful nature and distribution. If a negative environmental impact is confirmed and removal at sewage treatment plants is deemed the most effective solution, adjustments will be made to water authorities' treatment plants.

Such adjustments are often very costly. In addition to removing these substances, water authorities collaborate with other partners to prevent them from entering wastewater in the first place. This also applies to larger waste items, such as baby wipes, sanitary towels, cleaning gloves, face masks, and other substances that do not belong in the sewer system and place a heavy burden on treatment plants, including cooking fat

Another recent development is that water authorities are taking water samples at their treatment plants and sending them to research institutes for analysis to detect the presence of COVID-19. This enables infections to be detected at an early stage, since traces of the virus are present in faeces before people experience any symptoms. The Dutch **'Corona Dashboard'** provides daily updates on the results of the monitoring.

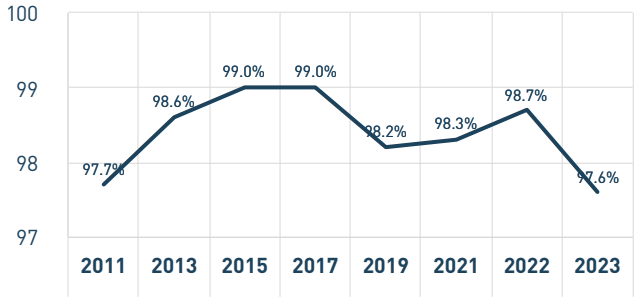
Compliance with discharge requirements

Every sewage treatment plant has a permit that specifies the standards that the treated wastewater must meet. These requirements are tailored to the surface water into which the wastewater is discharged. For instance, the requirements are more stringent if the receiving surface water borders a sensitive natural area. Water authorities conduct intensive monitoring of the treated water quality to ensure compliance with permit requirements. This is measured by the 'compliance percentage', which represents the percentage of measurements where the effluent quality meets the permit requirements. The figures in the table below show how well the permit requirements have been met.

When a permit limit is exceeded, this is typically the result of exceptional circumstances. Examples

include incidents or renovations that temporarily impair the installation's performance. Stricter discharge requirements or an increased demand on a facility can also cause compliance rates to fall. In 2023, for instance, installations were under significant strain due to exceptionally wet weather, which is why the compliance rate that year was lower than in previous years.

COMPLIANCE PERCENTAGE OF TREATED WASTEWATER DISCHARGES



VERDYGO, A MODULAR SEWAGE TREATMENT SYSTEM DEVELOPED BY THE LIMBURG WATER AUTHORITY

Traditional sewage treatment plants are primarily composed of fixed components, including large, underground concrete basins. The Limburg Water Authority has developed a flexible, future-proof and sustainable modular design for wastewater treatment plants: the Verdygo concept. Based on standardised modules placed on an elevated structure, Verdygo allows plants to be built, modified or expanded more efficiently.

Verdygo treatment plants consist of compact, above-ground modules that are connected to each other via a plug-and-play system. These modules are easy to replace, transport, and scale up or down as needed. The key benefits of the Verdygo concept include:

- Modular and flexible: easily adapted or expanded in response to changing capacity needs or new technologies. This makes it easier to respond to future shifts in legislation, climate or population.
- Shorter construction time: these prefabricated modules significantly reduce construction and installation time.
- More sustainable: efficient use of materials and energy-saving technologies, with the option to reuse components.
- Lower life cycle costs: flexibility and scalability help reduce maintenance and adaptation costs over time.

PROTECTION AND RESTORATION OF BIODIVERSITY AND ECOSYSTEMS

The term 'biodiversity' refers to the variety of life, including plants, animals, microorganisms, fungi and the communities they form together, as a coherent whole. Good biodiversity is extremely important because our quality of life depends on it. It is also important for water management and, therefore, for water authorities. Healthy soils are essential for proper water collection, and healthy ecosystems are the foundation for good water quality. However, as is the case worldwide, biodiversity is declining in the Netherlands, and climate change is expected to cause further loss of biodiversity. The water authorities are therefore calling for measures to promote the greening of public spaces. They also support the transition to sustainable agriculture and horticulture, as well as the reduction of emissions into water and soil. However, the water authorities are also taking action to improve biodiversity themselves.

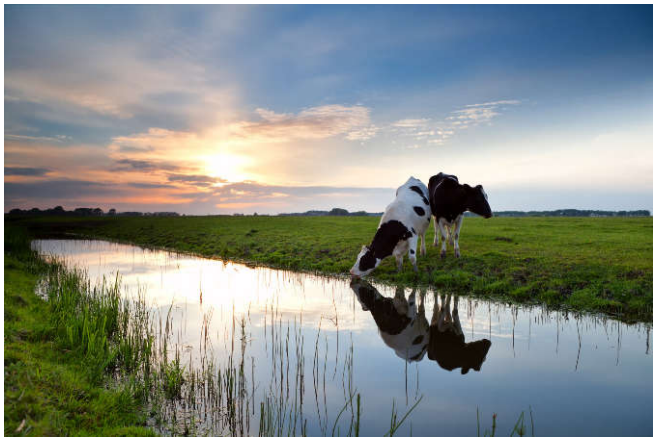
CONTRIBUTIONS BY THE WATER AUTHORITIES

Since 2020, the water authorities have been partners in the Delta Plan for Biodiversity Recovery. Through this initiative, they have confirmed their commitment to strengthening biodiversity in the Netherlands over the coming years. They are doing this by making as many 'nature-friendly choices' as possible when carrying out their duties, and by working with partners to strengthen nature in the design and management of surface waters, water authority areas and dikes. Examples of biodiversity-enhancing measures taken by water authorities include creating flower-rich embankments and natural riverbanks, restoring meandering streams, providing fish migration facilities and connecting nature areas. They have a unique opportunity to do the latter because the waterways and dikes they manage form a 250,000 km network criss-crossing the whole of the Netherlands. This network is known as the Blue-Green Network.

The measures taken by the water authorities to ensure good water quality also contribute to biodiversity. Such measures are an essential prerequisite for a healthy living environment, benefiting fish, insects, amphibians, plants, birds and mammals.

Additionally, the measures taken by water authorities to reduce nitrogen emissions are crucial for maintaining biodiversity. Excessive nitrogen deposition in the natural environment leads to a decline in biodiversity. This disrupts the balance of nature. This is one of the reasons why the water authorities are partners in the Clean and Emission-Free Construction programme, which aims to reduce nitrogen emissions during the construction of infrastructure and buildings.

Finally, the water authorities' efforts to combat invasive alien species also contribute to the preservation of biodiversity. These are plants and animals that are not native to the Netherlands but are spreading here. They threaten biodiversity by displacing native plant and animal species. Examples include muskrats, nutria, American crayfish and Japanese knotweed. The water authorities combat these species in water systems and on their own land, while also conducting research into how their populations can be controlled.



THE DRENTS OVERIJSSELSE DELTA WATER AUTHORITY IMPROVES BIODIVERSITY

Located in the provinces of Drenthe and Overijssel, the Drents Overijsselse Delta Water Authority is set to redesign and carry out major maintenance on the Steenwetering, a waterway situated southeast of Hasselt. This is to prepare the Steenwetering for the future, improving water retention and drainage as necessary. The water authority is also taking various measures to improve water quality and biodiversity.

This will involve dredging the Steenwetering and replacing two bridges and a culvert with three bridges. These measures will improve water flow. Composite, a sustainable alternative to concrete, will be used for the construction of the bridges wherever possible. Furthermore, four kilometres of nature-friendly banks will be created to improve water quality and biodiversity. Space has also been allocated for a 'kingfisher wall', which will provide these birds with a place to build their nests. These plans have been developed in consultation with local residents and other stakeholders.

APPENDIX

- Water authorities dilemma towards the EU Taxonomy
- Second opinion by cicero
- Disclaimer

3

WATER AUTHORITIES DILEMMA TOWARDS THE EU TAXONOMY

Water authorities as decentralized governmental bodies, are currently not in scope of the CSRD and EU Taxonomy. This means that they do not have a formal reporting obligation on the EU Taxonomy. This makes it difficult for us as their bank to determine to what extent the financing we provide is in line with the Taxonomy. Another complicating factor is the fact that the financing we provide is merely so-called budget financing, intended to use for activities related to their statutory tasks and clearly not earmarked for one specific project as is the case with project financing.

Water authorities recognize the importance of the EU Taxonomy and, although not in scope (yet), put effort to be able to report on the extent of compliance and eligibility. In that respect we closely collaborate with the 'Unie van Waterschappen' to monitor and discuss most recent developments.

A number of economic activities that the water authorities carry out or are included in the EU Taxonomy (i.e. construction, expansion or renovation of a sewage treatment plant, the digestion of sewage sludge, the construction of infrastructure for water transport, dredging, the restoration of wetlands, the peat meadow approach and the production of biogas).

NWB Bank uses this appendix to demonstrate how the activities of the water authorities, and thus its current Green Bond framework, might align to the existing technical screening criteria (hereafter TSC) in relation to the EU Taxonomy environmental objectives. In previous editions of this Water Bond newsletter we already showed the degree of potential alignment. In this edition we show the outcome of our analysis on the water authorities activities, financing categories and their Taxonomy alignment. The analysis teaches us that it is very complicated to determine to which extent the activities comply with the Taxonomy. Next to that it proves that the effort required to meet the number of TSC to be qualified as sustainable is very high. The TSC seem to be defined for commercial/industrial treatment activities, and do not always align with the public sector management approach by the water authorities. Also the TSC for waste water collection and treatment (activities 5.3 and 5.4) have a focus on energy efficiency that is misplaced: certain new technologies have a significant lower climate footprint, while their (renewable) energy consumption is higher.

On the next two pages the outcome of our analysis is outlined. The discussions and analysis will be continued coming year to support our voluntary reporting ambition on the EU Taxonomy alignment.

Environmental objectives	Economic activity / Technical Screening Criteria	Outcome analysis
Climate change mitigation	**5.3 Construction, extension and operation of waste water collection and treatment** The net energy consumption of the waste water treatment plant equals to or is lower than: a) 35 kWh per population equivalent (p.e.) per annum for treatment plant capacity below 10.000 p.e.; b) 25 kWh per population equivalent per annum for treatment plant capacity between 10.000 and 100.000 p.e; c) 20 kWh per population equivalent (p.e.) per annum for treatment plant capacity above 100.000 p.e	In order to relate the actual energy consumption to the standards of the TSC, information about the net energy use and the capacity of the water authorities sewage treatment plants is required. • Gross energy consumption per water authority is available. Net consumption can be obtained by combining the share of the water authorities own energy generation with the gross energy consumption. However the share of own generation is only known at the level of the entire water authority and not at installation level, which results in inaccuracy. • Next to that, water authorities distinct energy production on its own property and outside its own grounds. For calculation purposes the first one seems most logic to be used here. • It is unclear whether the population equivalent needs to be determined on current capacity level or the designed capacity level. For now the first one is used in the indicative calculations (the latter one will show better results) As a result it is hard to report a comprehensive number per water auhtority that is approximately correct in terms of quality and quantity. **Outcome 2021:** For 313 out of the 315 in 2021 active wastewater treatment plants, enough data is available to relate energy consumption to the TSC, resulting in the following comparison.
Climate change mitigation	**5.4 Renewal of waste water collection and treatment** 1. The renewal of a collection system improves energy efficiency by decreasing the average energy consumption by 20 % compared to own baseline performance averaged over three years, demonstrated on an annual basis. That decrease of energy consumption can be accounted for at the level of the project (i.e. the collection system renewal) or, across the downstream waste water agglomeration (i.e. including the downstream collection system, treatment plant or discharge of waste water). 2. The renewal of a waste water treatment plant improves energy efficiency by decreasing the average energy consumption of the system by at least 20 % compared to own baseline performance averaged over three years, demonstrated on an annual basis. 3. For the purposes of points 1 and 2, the net energy consumption of the system is calculated in kWh per population equivalent per annum of the waste water collected or effluent treated, taking into account measures decreasing energy consumption relating to source control (reduction of storm water or pollutant load inputs) and, as appropriate, energy generation within the system (such as hydraulic, solar, thermal and wind energy). 4. For the purpose of point 1 and 2, the operator demonstrates that there are no material changes relating to external conditions, including modifications to discharge authorisation(s) or changes in load to the agglomeration that would lead to a reduction of energy consumption, independent of efficiency measures taken.	Water auhtorities do not have data available that shows specifically that renewal of sewage treatment plants results in a 20% decrease in average energy comsumption compared to own baseline performance. Data is available on the annual energy consumptions of the various installations, but no information (yet) on the years in which renovations have taken place. For expenditures, proxies can be taken based on capital costs of the investment expenditures (in 2022 307 million). However, these capital costs are part of the larger amount of the operating costs of wastewater treatment plants (not only for construction / acquisition).

Capacity (population equivalent)	Number of treatment plants	% of treatment plants energy use <= TSC	% of treatment plants energy use > TSC
< 10,000	29	65.5%	34.5%
10,000 - 100,000	200	37.5%	62.5%
> 100,000	84	28.6%	71.4%

Environmental objectives	Economic activity / Technical Screening Criteria	Outcome analysis
Climate change mitigation	**5.6 Anaerobic digestion of sewage sludge** 1. A monitoring and contingency plan is in place in order to minimise methane leakage at the facility. 2. The produced biogas is used directly for the generation of electricity or heat, or upgraded to bio-methane for injection in the natural gas grid, or used as vehicle fuel or as feedstock in chemical industry.	Aa an elaboration of the 'Towards climate neutrality' vision, an action plan has been drawn to limit methane emissions from sludge cleaning as much as possible. As part of that measures to be taken per water authority per sewage treatment plant to reduce methane emissions are identified. In 2021 water authorities fermented 81% of the sludge into biogas. The costs of sludge cleaning are part of a larger amount of sludge processing costs. At the moment no information available to isolate these costs.
Climate change adaptation	**14.2 - Flood risk prevention and protection infrastructure**	The technical screening criteria are qualitative in nature, which makes it hard to determine from the available data whether and to what extent activities and projects of the water authorities comply with the Taxonomy. Also this makes it hard to get aligned clarity from the individual water authorities.

WATER BONDS OUTSTANDING AND USE OF PROCEEDS 2024[4]

Total outstanding loans to water authorities **€ 8,965,115,804.00**

Outstanding Water Bonds **€ 7,197,132,131.00**

ISIN	Currency	Nominal (mln)	Maturity
XS1595814465	SEK	1,250	2025-04-11
XS2024769619	SEK	200	2025-09-07
XS1284550941	EUR	1,000	2025-03-09
XS1386139841	USD	1,250	2026-03-24
XS2553554812	EUR	500	2027-09-11
XS1757822496	SEK	2,000	2028-01-24
XS2180643889	USD	500	2030-05-28
XS2834365277	EUR	1,000	2031-06-05
XS2613821300	EUR	1,500	2033-04-20
XS2057845518	EUR	500	2034-02-10
XS2334267098	EUR	710	2051-04-26

4) EY has provided reasonable assurance on our Financial Statements 2024, including the reported amount of ESG bonds outstanding, consisting of Water Bonds and Social Bonds. The Financial Statements also include the amount of outstanding loans to water authorities.

SECOND OPINION BY CICERO

Our Water Bonds are considered 'Dark Green' by the Norway-based Center for International Climate Research (CICERO), which means that they are consistent with the aim of creating a low-carbon and climate-resilient future. Please see below their opinion in *italic*. The full report can be found on our **website**.

Overall, NWB Bank'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 21 autonomous, publicly owned, regional water authorities. 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 refinancing 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 Bank'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.

DISCLAIMER

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This report does not contain all relevant information relating to the Company or its Securities, particularly with respect to the risks and special considerations involved with an investment in the Securities of the Company, and is qualified in its entirety by reference to the detailed information which will appear in the Offering Document. No Securities have been or will be registered under the U.S. Securities Act of 1933, as amended (the 'Securities Act'). Accordingly, any Securities will only be issued in the United States pursuant to an exemption from or in a transaction not subject to the registration requirements of the Securities Act.

Statements in this report that are not historical facts are 'forward-looking statements', including forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements are based on intent, belief or current expectations of future events of the Company's management and are subject to risks, uncertainties and assumptions. Should one or more of these risks or uncertainties materialise, or should underlying assumptions prove incorrect, the actual results of the Company may vary materially from those expressed in or implied by the forward-looking statements. Given these risks and uncertainties, you are cautioned not to place substantial reliance on forward-looking statements, which are made only as of the date of this report.

For a discussion of some of the important factors that could cause the Company's results to differ from those expressed in or implied by the forward-looking statements, please be referred to the Offering Document that will be delivered in connection with any Securities offering. The Company disclaims any obligation to update, or to announce publicly any revision to, any of the forward-looking statements contained in this report.