AS Tallinna Vesi

Environmental Report 2024

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Chairman's Statement

Our activities involve extensive use of natural resources both in the supply of drinking water and in the treatment of wastewater. We recognise this huge responsibility and are committed to minimising the impact of our business on nature, while providing a reliable and high-quality service to our customers. In 2024, we took important steps towards achieving the ambitious targets set for ourselves in the Climate Impact Reduction Plan. This includes energy production at the combined heat and power plant set up at the wastewater treatment plant, as well as the continued use of ice-pigging as a more environmentally friendly method of maintaining pipelines.

Investing for the future

In 2024, Tallinna Vesi continued to install smart water meters at a rapid pace. This will free our customers from the obligation to report their water meter readings every month. More than 60% of customers have already got new smart meters, and the plan is to cover the entire service area with smart water meters by 2026. The new meters provide information on water consumption, giving us a better indication of water consumption in our service area and allowing us to detect leaks in customer pipes as early as possible. This will help protect the environment and minimise potential property damage from water accidents.

In 2024, Tallinna Vesi invested approximately 50 million euros in its fixed assets. This was 15 million euros more than in the year before. These investments will ensure the continuity of water services in our service area and improve the quality of the services we provide.

The investment plan for the coming years is based on the Tallinn Public Water Supply and Sewerage Development Plan 2023–2034 and is aimed at reducing the environmental impact of water use, ensuring the continuity of services and sustainable urban development. These and future investments will continue to ensure a high quality of drinking water for our customers and will help to keep the natural environment clean. The use of modern technologies and materials will extend the average life of pipelines and improve the efficiency of treatment systems. This will allow us to ensure the continuity of the vital services we provide at affordable prices and with minimal disruption to people's daily lives.

Modern technologies

In 2024, investment projects continued at the treatment plants, such as the renovation of the clarifiers at the Ülemiste Water Treatment Plant and the preparation of two major projects, one to upgrade and reconstruct the ozone production used in water treatment and the other to replace the sedimentation technology currently used in the clarifiers with flotation technology. These projects aim to reduce energy consumption, improve the reliability of the treatment plant and increase its production capacity.

One of the major projects at the Paljassaare Wastewater Treatment Plant was the reconstruction of the digesters, which was completed in 2024. While the digesters were being reconstructed, a combined heat and power (CHP) plant was also being built, which will allow the biogas to be used not only to generate heat, but also to produce most of the electricity needed to run the wastewater treatment process. The CHP plant is now complete and has been tested for energy production. This plant will increase the plant's resilience to prolonged power outages. In the summer, we started work on the reconstruction of the secondary clarifiers. Over the next three years, we will reconstruct 12 secondary clarifiers, which will further enhance our biological treatment.

Our subsidiary Watercom continued to expand the use of ice-pigging technology for cleaning water pipes, launched in 2023. Ice-pigging is many times more efficient, faster, and better for the environment than any other maintenance method used to date. The service has got off to a successful start, attracting interest from a number of companies whose core business uses pipelines. At the end of 2024, Watercom invested in equipment that will allow the company to rehabilitate pipes using a no-dig method, i.e. without digging a trench. The service has been launched; deployment and development are in progress.

High-quality drinking water and treated effluent

The quality of drinking water in Tallinn remained consistently high, with 99.6% of water samples taken from consumers' taps meeting requirements. A total of more than 3,000 water samples were taken from consumers' taps in 2024. High-quality tap water is ensured by continuous development and maintenance of the water network.

The quality of the effluent treated at the Paljassaare Wastewater Treatment Plant remained very good in 2024, again exceeding a number of quality standards. We monitor the concentration of pollutants in the wastewater received at the treatment plant and in the effluent leaving the plant to assess the efficiency of the treatment process and the quality of the effluent. During 2024, we removed more than 730 tons of debris, 200 tons of grit, 1,800 tons of nitrogen and 240 tons of phosphorus from the wastewater.

Contribution to the community

Throughout the summer, 53 public water taps in Tallinn provided clean drinking water for everyone. In addition, Tallinna Vesi supported a number of community and sports events, such as the Investment Festival and IRONMAN Tallinn — just to name those with the largest number of visitors — by providing tanks with fresh water.

In August, we took part in the Opinion Festival for the first time, chairing a discussion on sustainable consumption in the „Energetic Economy" panel. In the same month, a long-established sporting event took place, the 52nd edition of the Run around Lake Ülemiste, hosted by Tallinna Vesi. We contributed to Impact Day, a sustainability festival promoting environmental education, and community events such as Tallinn Old Town Days, Summer Day of the Association of Large Families in Tallinn and Harju County, Tallinn Maritime Days, Kalamaja Days, Tallinn Urban Space Festival and KopliFest.

As a supporter of the Estonian Paralympic Committee, the company cheered for the Estonian para-athletes competing in the Paris Paralympics, which took place from 28 August to 8 September. We supported organisations that do valuable work in helping people in need, such as the Estonian Agrenska Foundation, the Autismikool Charity Fund, the North Estonian Association of the Blind, the Tallinn Women Crisis Centre, the Estonian Food Bank and the Tallinn Children's Hospital Foundation. We also continued to support the Kindergarten Õunake and the Ristiku Primary School in Tallinn.

We organised open days and guided tours at the Ülemiste Water Treatment Plant and the Paljassaare Wastewater Treatment Plant, held discussion groups on water and environmental issues, and participated in the Water Day organised by the Estonian Waterworks Association. In total, more than 2,300 people took part in these initiatives.

As a result of the cooperation project with the students from the Estonian Academy of Arts, an eye-catching street art was designed and produced to decorate the facades of water pumping stations across the city.

I would like to thank the entire dedicated team at Tallinna Vesi and Watercom, the members of the Supervisory Council, our customers, consumers and cooperation partners for the good and constructive cooperation!

Aleksandr Timofejev

Chairman of the Management Board

TALLINNA VESI IN BRIEF

AS Tallinna Vesi (hereinafter Tallinna Vesi) is the largest water utility in Estonia, providing drinking water and wastewater services to nearly one third of Estonia's population. We serve approximately 25,000 private customers and businesses and about 500,000 end consumers in Tallinn and its surrounding areas. As of 31 December 2024, AS Tallinna Vesi employed 279 people. The activities of the company according to NACE are 36.00 and 37.00.

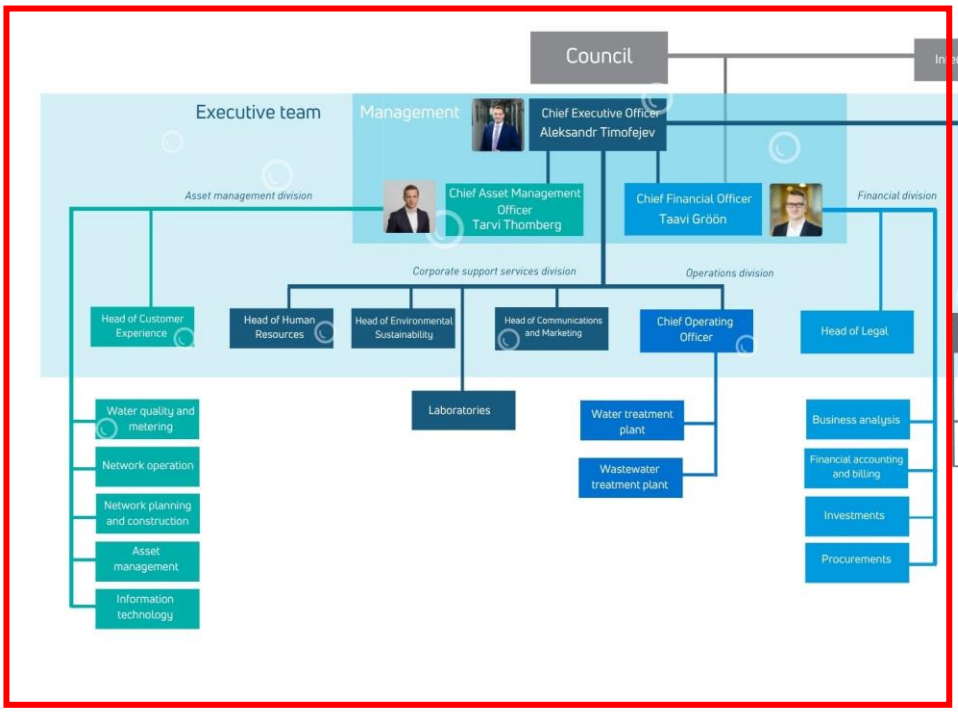


Figure 1: The structures of AS Tallinna Vesi and Watercom OÜ. EMAS is only implemented in AS Tallinna Vesi (marked in red).

The company has two treatment plants: the Water Treatment Plant at Ülemiste and the Wastewater Treatment Plant at Paljassaare. Tallinna Vesi also has an accredited water laboratory and an accredited wastewater laboratory.

AS Tallinna Vesi was privatised in 2001. The company operates under an administrative contract with the City of Tallinn. This contract outlines the service quality requirements and reporting obligations, and is valid from 01/12/2022 to 30/01/2032. Along with the approval of the administrative duty, AS Tallinna Vesi was appointed as the water undertaker within the main licensed territory of the public water and sewerage system in Tallinn until 30 November 2032 (incl.).

The public water supply system comprises more than 1,224 km of water pipes, 22 water pumping stations and 49 groundwater pumping stations with 91 boreholes. The catchment area in Harju and Järva Counties covers around 1,800 km^2. The public sewerage system comprises more than 1,196 km of wastewater pipes, 536 km of stormwater pipes and 181 wastewater and stormwater pumping stations across the licensed territory.

MAIN PRODUCTS AND SERVICES

Collection, treatment and supply of water

Collection, treatment and disposal of sewage and storm water

Design works

Water and wastewater services

Laboratory services

Pipe construction works

OPERATIONAL SITES

- Head Office, customer service and support services are located at Ädala 10, Tallinn.
- Ülemiste Water Treatment Plant, water and microbiological laboratory are located at Järvevana tee 3, Tallinn.
- Paljassaare Wastewater Treatment Plant, composting fields and wastewater laboratory are located at Paljassaare põik 14, Tallinn.
- The catchment area of ca 1,800 km^2 is located in Harju and Järva Counties.

OUR VISION, MISSION AND VALUES

VISION

We create better life with pure water

MISSION

We connect people to the vital cycle of water

OUR VALUES

I am part of the team

I know where the company is heading and help to achieve common goals through cooperation. I keep good relations and create a great working environment.

I am reliable

As a professional, I act ethically, fairly and transparently and keep the promises made.

I care

I value myself, my work, the environment and the people around me. I do my part to make high quality water services available to a large portion of Estonia's population.

I am forward looking

I act responsibly and invest wisely. I create opportunities to develop the company.

Environmental Policy

We are the largest water company in Estonia and our business influences nearly one third of Estonia's population. We acknowledge that by providing the service that is compliant with all requirements. We impact the quality of life of the people who live in Tallinn and its neighbouring municipalities, as well as all those living around the Baltic Sea. Therefore, we consider the impact that we have on the surrounding living and natural environment, and the interaction with the interests of various stakeholders. Our guiding principles can be found here.

- **We work towards improving the water status of the Baltic Sea, which is sensitive to the impact of human activity.**
    - We reduce the amount of pollutants and nutrients discharged to the Baltic Sea by applying modern wastewater treatment technologies and best practices.
    - We deploy smart solutions and technologies to protect the living and natural environment around the Baltic Sea.
    - We share knowledge with the community and partners to develop sustainable practices.
    - We follow and meet the requirements that apply to us and strive to do more than is expected of us.
- **We are committed to actions that take us towards the ambitious goal of becoming climate neutral and help preserve the living and natural environment around us in the face of climate change.**
    - As an energy-intensive company, we look for ways to use energy generated in our processes and we primarily use energy from renewable resources.
    - We work with partners to reduce greenhouse gas emissions from our supply chain and promote sustainable practices.
    - We prefer vehicles that reduce our environmental footprint when renewing our fleet and plan our logistics using sustainable working practices and modern solutions.
    - We analyse technological developments to find solutions that help us reduce emissions from wastewater treatment processes.
    - Short-term, localised and intense rainfall events caused by climate change will pose challenges for urban drainage, which we will address with intelligent real-time monitoring systems.
    - We are pioneering the adoption of nature-friendly stormwater solutions in the development of separate stormwater systems.
    - We are preparing for more frequent extreme weather events in the future by planning and building alternative ways to channel water away from the city.
- **We ensure the sustainable use of water resources in providing water services.**
    - We use water resources sustainably, keeping in mind that groundwater must be equally available for future generations.
    - We look for ways to reduce the amount of water we use in our processes and to reuse process water used in our operations.
    - We work to reduce and quickly identify water losses in drinking water pipes, thereby improving resource efficiency of the company.
- **We find ways to implement the principles of the circular economy, reduce waste generation and maximise the recycling of waste streams.**
    - We work towards ensuring that valuable plant nutrients and organics in sludge are recycled, mainly in landscaping and agriculture.
    - We build and renovate pipelines in a resource-efficient way, using the no-dig methods, and increase the reuse of waste from maintenance and construction activities.
    - We are raising awareness among our staff to improve the quality of waste sorting and thus the recycling potential of waste generated.

Environmental Management System

We have implemented an integrated management system that meets the relevant quality, environmental and health and safety standards. The company's environmental activity complies with the requirements of the international environmental management standard ISO 14001 and the Regulation (EC) No 1221/2009 EMAS (Eco-Management and Audit Scheme), as well as the requirements of amendments thereto enforced by the Commission's Regulations (EU) 2017/1505 and (EU) 2018/2026.

The environmental management system covers all the areas of activity of AS Tallinna Vesi: the abstraction and treatment of groundwater and surface water for the production of drinking water, supplying drinking water to consumers in Tallinn and the surrounding area, collection and treatment of wastewater and stormwater, and customer service to ensure the intended service.

The environmental management system forms a part of the company's management system, as we strive to make the links between the company and the environment part of our strategy and to take them into account in our everyday operation.

The basis for the environmental management system is the identification of environmental risks, environmental aspects and consequent potential environmental impacts, which form the basis for setting the company's environmental targets to improve the environmental performance. Significant environmental aspects are such activities which, directly or indirectly, influence the nature, quality of services, co-operation with stakeholders, health and quality of life of residents, and our business performance. The assessment is based on the connection of the activity and legal acts, the frequency of its occurrence, the impact on reputation and cooperation with stakeholders, and the environmental impact and its extent.

Environmental management system has been aligned with the company structure. The main responsibility for ensuring and improving the functioning of the environmental management system lies with the company management and the heads of structural units. Environmental aspects and targets are prepared at the initiative of the Environmental Specialist in cooperation with the unit managers, who involve their staff. We measure, monitor and evaluate environmental performance indicators at least quarterly, and based on those results we produce each year our environmental report, which is made available to public.

SIGNIFICANT ENVIRONMENTAL ASPECTS AND TARGETS

Table 1: SIGNIFICANT ENVIRONMENTAL ASPECTS IN 2025

Activity	Environmental aspect	Direct or indirect impact	Environmental impact of the aspect	Impact trend*	Further actions
Maintaining of sanitary protection areas	Land use to support biodiversity	Indirect	Sanitary protection area protects drinking water sources and the natural environment, supports the improvement of the biodiversity around Lake Ülemiste and in the lake, and helps to preserve green areas within the city	+	Maintaining the sanitary protection areas, co-operation with the legislator and local governments to retain the areas
Use of biogas to produce heat and electricity	Prevention of emissions to air	Direct	Using energy produced from biogas generated in the sludge digestion process reduces the ecological footprint and dependence on non-renewable sources of energy	+	Maximising the use of biogas generated by implementing the CHP technology
Use of electricity	Use of natural resources for the production of electricity	Indirect	Natural resource depletion, greenhouse gas emissions from biomass electricity production	−	Analysing electricity consumption, purchasing more energy-efficient equipment and using more energy-saving modes, increasing electricity production from biogas and solar energy. Construction of separate sewer systems.
Use of green electricity	Prevention of emissions to air	Indirect	Green electricity production has lower greenhouse gas emissions and using green electricity reduces carbon footprint	+	Continue using green energy while looking for solutions to reduce electricity consumption. Contributing to the production of green energy (increase green energy production).
Water use in processes	Use of water resource	Direct	Increased need for water treatment and the resulting further use of resource and effects on the environment	−	Improving analysis and control, reducing the water use in processes, reducing use in production by improving processes and in networks by using the ice-pigging method. Using backwash water from filters.

Use of chlorine in water treatment	Risk of an environmental accident	Direct	Improper handling may result in leakage and environmental contamination; chlorine is an explosive chemical	-	Monitoring and analysing the optimum use of chlorine, minimising the risk of possible leaks. Conducting crisis exercises.
Generation of construction waste	Waste generated during the construction and repair of pipelines	Direct	Construction and rehabilitation of water and wastewater pipes generate waste that require handling. Low recycling potential.	-	Continue using no-dig methods, cutting down on excavations and using more trench support. Investments in replacing pipelines to reduce the number of emergencies.
Illegal connections to sewer and storm-water network and emergency incidents	Risk of environmental pollution	Direct	Environmental pollution, adversely affecting the marine environment, -life and the quality of living environment	-	Detecting and closing illegal connections, carrying out regular pipeline maintenance (removing blockages)
Supply of consumers with clean drinking water meeting all the requirements	Waste prevention	Indirect	High-quality drinking water has a positive impact on public health. Consumers can choose tap water over bottled water, reducing the environmental impact of single-use plastic bottles.	+	Continuous work in all stages of water treatment and distribution, publishing information about water quality, maintaining the sanitary protection areas, holding awareness campaigns, providing drinking water at public events and from public water taps
Wastewater treatment	Exhaust and greenhouse gas emissions	Direct	Exhaust gas emissions adversely affect ambient air quality and nature, and GHG emissions cause global warming	-	Reconstructing the technology, implementing the Climate Impact Reduction Plan
Sludge handling	Avoiding landfilling of sewage sludge	Indirect	Recovery of sewage sludge reduces the amount of waste landfilled	+	Looking for contract partners, maximising the amount of sewage sludge recovered
Wastewater treatment process	Noise and smell disturbances	Direct	Unpleasant smells and noise create an unattractive living environment	-	Improvements to technological processes where possible
Discharge of untreated wastewater into the environment	Pollutants and waste from the wastewater	Direct	Environmental pollution, adversely affecting the marine environment, -life and the quality of the living environment	-	Reconstructing the treatment process, extending separate sewer systems in cooperation with the city. Installing screens at the main pumping station.

Discharge of partly untreated waste-water into the environment	Pollutants from wastewater	Direct	Non-compliant water adversely affects the marine environment, - life and the quality of the living environment	−	Continuously analysing, monitoring and controlling the treatment process
Discharge of treated effluent into the environment	Reducing the pollutants from wastewater	Direct	Treating wastewater (reducing pollutants) positively affects the marine environment, - life and the quality of the living environment	+	Analysing, monitoring and, if necessary, reconstructing the treatment process
Discharge of treated effluent into the sea	Pollutants from wastewater	Direct	Discharges (both compliant and non-compliant) adversely affect the marine environment, -life and the quality of the living environment	−	Analysing, monitoring and, if necessary, reconstructing the treatment process
Discharge of polluted stormwater into the sea	Pollutants from stormwater	Direct	Polluted stormwater (microplastics, pollutants) adversely affects the marine environment, -life and the quality of the living environment	−	Continuously monitoring and assessing the outlets to detect and eliminate sources of pollution

* Aspect with a positive or a negative impact

Table 2: ENVIRONMENTAL TARGETS AND PERFORMANCE IN 2024

Target	Indicator	2024 Performance
Reduce the percentage of clean water losses by reducing the leakages	≤ 14%	13.67%
Reduce the company's process water consumption	Activities carried out	A solution was designed to enable the reuse of backwash water from the filters at the water treatment plant. For economic reasons, implementation of the project was postponed until the coming years. At the wastewater treatment plant, mechanical screens have started using process water, meaning that drinking water is no longer used for technological processes.
Reduce the number of sewer blockages compared to 2023	Number of blockages per year < 533	441
Increase the number of people using public sewerage by reducing the number of people treating wastewater locally	Reduce the number of idle supply points by 10%	Contracts were signed with 24 properties out of 220, representing appr. 11% of the total
Reduce the quantities of waste generated with the construction and rehabilitation of water and wastewater pipes by increasing the use of no-dig methods	25% of all rehabilitation works related to sewer systems are carried out using no-dig methods	41%
Activities comply with the terms set out in the environmental permits issued by the Environmental Board	0 non-compliances	0 non-compliances
Disposal of stabilised sewage sludge	0 tons of stabilised sewage sludge landfilled	42,773 tons of stabilised sewage sludge handed out to contractual partners and 0 tons landfilled
Reduce the quantities of non-stabilised sewage sludge	≤ 500 tons of non-stabilised sludge landfilled	0 tons of non-stabilised sewage sludge landfilled
Recovery of grit removed from grit traps	0 tons of washed sediments from grit traps landfilled	0 tons of washed sediments from grit traps landfilled

Produce our own electricity	17% of the total electricity consumed in the company is produced in the CHP plant	A total of 8,167 MWh was produced in the CHP plant. A total of 18.8% of the electricity consumed in the company's was generated by the CHP plant.
Replace natural gas at the WTP	Connection to the district heating network at the WTP is completed	Target met
Climate impact risk assessment	A climate impact risk assessment has been carried out	A climate impact risk assessment has been conducted. A follow-up meeting to update the action plan on physical risks is scheduled for 2025.
Reduce scope 1 and 2 emissions > 300 t compared to 2023	Scope 1 and 2 emissions reduced by at least 300 t compared to 2023	The CHP plant started operation, the WTP was connected to the district heating network and energy consumption decreased. However, due to an increased pollution load received at the wastewater treatment plant (WWTP), scope 1 and 2 emissions increased by 435 t tonnes.
Replace existing combustion cars with electric cars	At least 2 new electric cars are purchased	Target met. The company has 8 electric cars.
Integrated environmental permit renewal	The integrated environmental permit is renewed	The Environmental Board issued a renewed integrated environmental permit 10/01/2025
Enhance biodiversity in WTP & WWTP territories	Test areas to increase biodiversity created in the WTP & WWTP territories. Lawn mowing reduced	Target not met. The project stopped because the person responsible left the company.
Raise the environmental awareness of various stakeholders reg. the company's activity to improve and keep the company's good image (reputation)	≥ 1,500 people participated in classes/tours Draw media attention to environmental issues (≥ 3 media initiatives) ≥ 2 campaigns or participation in outdoor events on topics related to water and the environment Carry out an environmental awareness month	2363 people participated in classes and tours 76 media coverages Participation in at least 8 outdoor events. 2 campaigns on topics related to water and the environment were carried out. Environmental awareness months was carried out

Table 3: ENVIRONMENTAL TARGETS FOR 2025

Target	Actions	Indicator	Due date
Reduce the percentage of clean water losses by reducing the leakages	Fast detection and repair of leakages, improving the efficiency of work processes	Water loss rate in distribution network ≤ 14%	December 2025
Reduce the number of sewer blockages by 4% compared to the 2020–2022 average	Timely network maintenance	Number of blockages per year < 510	December 2025
Reuse of treated effluent at the wastewater treatment plant	Monitoring of the quantities of reused effluent	Quantities of effluent are monitored	December 2025
Reduce the number of properties not using public sewerage service	Encouraging customers to use the already installed supply points	Number of properties not connected to public sewerage service has been reduced by 15%	December 2025
All environmental permits are in place and our actions or inactions have not caused any pollution	The assigned specialists monitoring the obligations arising from the requirements and ensuring that these are complied with by their activity	Environmental permits are in place Number of pollution incidents = 0	December 2025
Monitor the greenhouse gas emissions from the wastewater treatment	Monitoring of N_2O emissions from wastewater treatment with on-site sensors	N_2O emissions are monitored	December 2025
Start the optimisation of wastewater treatment	Selection of a cooperation partner for the optimisation of the wastewater treatment process	Cooperation partner selected and contract signed	December 2025
Reuse waste from wastewater sludge treatment	Recovery of composted sewage sludge by producing compost soil that can be used in planting green areas, agriculture or re-cultivation. Finding potential partners and customers.	0 tons of stabilised sewage sludge landfilled	December 2025
	Washing of the grit removed from the process and mixing with sewage sludge to produce compost soil.	0 tons of washed sediments from grit traps landfilled	
Produce our own electricity	Producing of electricity from biogas as well as heat	More than 7,500 MWh of renewable electricity produced	December 2025

Reduce the quantities of waste and the resulting disruption to the city from the construction and rehabilitation of water and wastewater pipes by increasing the use of no-dig methods	Carrying out as much pipeline construction and rehabilitation as possible using no-dig methods	25% of all pipeline construction and rehabilitation is carried out using no-dig methods	December 2025
Raise the environmental awareness of various stakeholders reg. the company's activity to improve and keep the company's good image (reputation)	Organising environmental education classes for various age groups Organising activities (campaigns, open houses, events, cooperation etc.) to raise awareness among consumers, company's employees and the community	≥ 1,100 people participated in classes Media attention has been drawn to environmental issues (≥ 10 media initiatives) ≥ 5 campaigns or participation in outdoor events on topics related to water and the environment Environmental awareness month has been carried out	December 2025
Mapping and monitoring of potentially polluting customers	Mapping of previously unmonitored, potentially high-polluting customers and collecting min 1 monitoring sample from the customers included in the monitoring by expert assessment	Customers are mapped and sampled	December 2025
Monitoring of stormwater quality in the Lasnamäe water metering unit	Installing sensors and connecting them to the SCADA system	Sensors are installed and connected	December 2025

Carbon Footprint and Climate Impact Reduction

Being the largest water company in Estonia, we use a lot of natural resources. In order for natural resources to be available also for generations to come, we must minimise our impact on the environment. Since 2020, we have assessed the company's CO_2 footprint, and in 2022 we also prepared a Climate Impact Reduction Plan and set ourselves the following goals:

- The company is carbon-neutral by 2040 at the latest. To become carbon-neutral, we need carbon capture mechanisms, such as clear and transparent CO_2 offset, or greenhouse gas (GHG) capture technologies. We are closely monitoring the market and technological developments in this area and will meet the ambitious goal at the earliest opportunity.
- By 2030, we have reduced GHG emissions from scopes 1 and 2 by at least 50% compared to 2020. For scope 3, we apply principles of green procurement and other mitigation measures to emissions that can be influenced by choices made by the company.
- We only use electricity from renewable sources and have replaced natural gas with heat from renewable sources by 2030.
- We produce at least 50% of all electricity and heat needed within the company by 2030 at the latest. For this, we use the energy (biogas and heat) contained in wastewater and build solar parks.
- We have reduced the heat and electricity consumption by at least 10% by 2030, compared to 2020.

CARBON FOOTPRINT

The greenhouse gas footprint of AS Tallinna Vesi has been calculated in accordance with the internationally recognised and most widely used greenhouse gas reporting standard *GHG Protocol Corporate Accounting and Reporting Standard*. This standard includes the assessment of emissions of seven greenhouse gases — carbon dioxide (CO_2), methane (CH_4) nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3).

The standard divides greenhouse gas emissions from the company's operations into three scopes (areas of impact). Direct emissions from sources owned or controlled by the company fall within scope 1. Scope 2 covers indirect emissions from purchased energy. Scope 3 covers all other indirect emissions produced as a result of upstream or downstream activities in the company's value chain.

In 2020, which we count as our base year, the company's CO_2 footprint was 61,218 tons of CO_2eq, of which scope 1, the company's direct emissions, accounted for 49%. Scope 2, or used electricity and heat, accounted for 37% of the company's carbon footprint. Indirect energy emissions, such as emissions from the production of chemicals and spare parts, waste and employee mobility, making up scope 3, accounted for 14% of the company's CO_2 footprint. The assessment of scope 3 took into account the CO_2 impact of upstream supply chain activities.

From 2022 onwards, we calculate the carbon footprint every year. In 2024, the company's CO_2 footprint was 36,579 tons of CO_2eq, of which scope 1 accounted for 79.6% (2023: 76.7%), scope 2 for 0.6% (2023: 0.3%) and scope 3 for 19.7% (2023: 23%). The highest impact on the company's carbon footprint come from the mechanical and chemical-biological treatment of wastewater and composting of sewage sludge, these two together account for 95% (2023: 93%) of scope 1.

The biggest impact in the wastewater treatment process comes from N_2O and CH_4. Nitrous oxide (N_2O) is generally produced during the biological nitrogen removal process and occurs in all wastewater treatment plants applying biological treatment. Methane (CH_4) is the largest component of biogas that we use to produce heat. Methane is released into the environment mainly in the treatment process, from leaks in the system, and also during the composting of sewage sludge. Since N_2O and CH_4 have a global warming potential of 298 and 25 times that of CO_2, respectively, they produce a significant proportion of the company's footprint.

In 2024, the company's carbon footprint has reduced 40% compared to 2020. The most significant reduction was is scope 2 due to the shift to the use of electricity from renewable sources. In scope 1, the footprint from biogas combustion

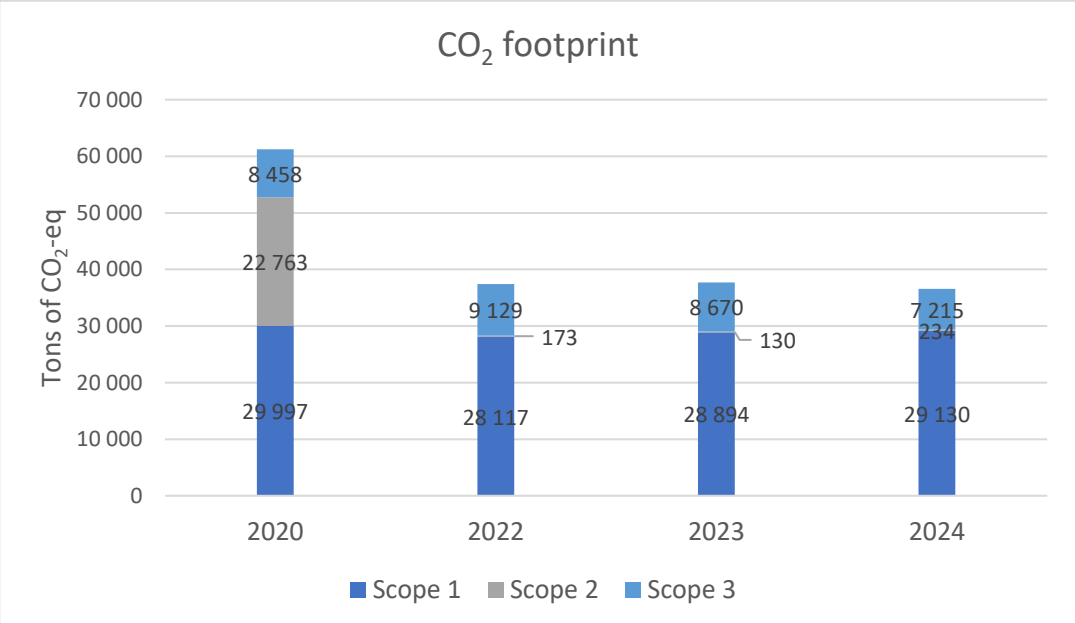
decreased, mainly due to the introduction of CHP technology, and the fossil fuel footprint decreased due to the fact that in the second half of 2024 the water treatment plant was connected to the district heating network and natural gas was no longer used in the plant, while emissions in scope 2 increased for the same reason.

Table 4: AS TALLINNA VESI'S CO_2 CARBON FOOTPRINT IN 2022–2024 AND COMPARISION WITH BASE YEAR 2020, tons of CO_2-eq

Scope	Emission source	2020	2022	2023	2024	Change compared to 2020, %
Scope 1	Wastewater treatment	17,156	15,898	15,948	16,303	-5
	Composting of sewage sludge	7,624	7,621	7,826	8,177	7
	Production and incineration of biogas	939	838	807	639	-32
	Fossil fuels*	959	1,166	1,105	766	-20
	Discharge of treated effluent and stormwater into the sea	3,319	2,594	3,113	3,245	-2
Scope 2	Electricity and heat	22,763	173	130	234	-99
	Scopes 1 and 2 in total	***52,760***	***28,290***	***28,929***	***29,364***	***-44***
Scope 3	Purchased goods and services	5,636	5,923	5,087	4,892	-13
	Fuel and energy-related activities*	1,920	2,232	2,266	1,520	-21
	Capital goods (fixed assets)	15	42	26	41	173
	Waste	650	686	535	501	-23
	Business travel	4	13	11	28	700
	Employee commuting	233	233	233	233	0
	Scopes 1, 2 and 3 in total	***61,218***	***37,419***	***37,087***	***36,579***	***-40***

* In connection with the corrections made to the amount of 'Other diesel' in the 2024 report, we have also retroactively corrected carbon emissions in the scopes of fossil fuels and fuel and energy-related activities.

Chart 1: AS TALLINNA VESI'S CO_2 FOOTPRINT IN BASE YEAR 2020 AND IN 2022–2024, tons of CO_2-eq



Compliance with Environmental Requirements

To a large extent, the company's environmental activities are regulated by requirements arising from the European Union (EU) as well as national legislation and the legal acts issued by local governments.

At the EU level, this means ensuring compliance with the EU Water Framework Directive (2000/60/EC). At the national level, compliance with the Water Act, Public Water Supply and Sewerage Act, Waste Act, Chemicals Act, Atmospheric Air Protection Act as well as implementing acts must be ensured. Besides these, we are governed also by other environmental legal acts. Pursuant to the Water Act, we must ensure that the effluent discharged from the wastewater treatment plant complies with established limits, and we act in accordance with the requirements of the Public Water Supply and Sewerage Act in our process of service and connection contracts. In organising the recovery of sewage sludge, we rely on the Waste Act. Under the Chemicals Act, AS Tallinna Vesi classifies a Category B major-accident company and is subject to specific requirements. The Atmospheric Air Protection Act specifies the air quality limit values and reporting obligations.

At the local level, we must comply with various rules and requirements applicable in Tallinn and in the surrounding municipalities, where AS Tallinna Vesi provides services.

We consistently monitor the amendments being made to the requirements and legislation. If changes are made to the legislation that concerns the company, those are communicated to the managers and specialists responsible for the relevant areas, allowing them to assess the impact of such amendments on the company and propose their changes, and upon entry into force amend the company processes accordingly, if necessary.

In cooperation with the Estonian Waterworks Association (EVEL), we participate in the drafting and rounds for comments on the draft acts and draft implementing acts pertaining to the water sector and environmental matters, by taking part in the working groups, presenting our opinions and proposing changes to the drafts under discussion. Where necessary, we have also communicated our positions directly to the relevant ministries without doing it via EVEL.

Also in 2024, we contributed to the identification of bottlenecks in existing law, by proposing several amendments to the Public Water Supply and Sewerage Act on various issues through EVEL. We also participated in the development of the new rules for connection to the public water supply and sewerage system of the City of Tallinn, which entered into force on 10/02/2025. Our specialists have also continued to participate in EurEau committees (on drinking water, wastewater, and legal and economic issues), which continue to contribute to the development of EU legislation. For example, we helped provide feedback on the new Urban Wastewater Treatment Directive, which entered into force on 01/01/2025 and will be transposed into Estonian law by 31/07/2027 at the latest. Work on the implementing legislation for the Directive is still in progress, but we have also provided input on the order in which feedback on the legislation should be provided. In addition, we have participated in discussions on water service reform initiated by the Ministry of Climate. We also provided feedback on the drafting of the proposed law amending the Water Act concerning local wastewater treatment. Regarding local treatment and removal of wastewater, we provided feedback on the relevant City of Tallinn rule, the updated version of which came into force on 09/12/2024. Furthermore, we provided feedback on Regulation No 61 of the Minister of the Environment, "Requirements for wastewater treatment and discharge of wastewater, stormwater, mine water, quarry water and cooling water, measures for assessing compliance and limit values for pollutant content", the amendments to which came into effect on 29/11/2024.

ENVIRONMENTAL PERMITS

We act in accordance with the requirements and terms set out in the environmental protection permits issued to the company. In 2024, the following environmental permits, issued to us by the Environment Agency, were in place:

- 5 environmental permits (details on page 23 and 46);
- 1 integrated permit (details on pages 23, 42 and 46);

REQUIREMENTS OF THE ADMINISTRATIVE CONTRACT

At the end of 2022, a new administrative contract was signed between the City of Tallinn and AS Tallinna Vesi, the main purpose of which is to supply water to the customers of the public water supply and sewerage system in Tallinn, and to collect and treat wastewater, stormwater, drainage water and other soil and surface water. The new Administrative Contract took effect from 2023. Under the Administrative Contract, all investments in the public water supply and sewerage facilities will be recovered through the charges authorised by law, in particular the prices for water services and connection charges. Supervision of the performance of the Administrative Contract is carried out by an authority of the City of Tallinn or by an agency or person authorised by the City of Tallinn in accordance with the rules provided for by law and following the principle of avoiding conflicts of interest.

In 2024, all of the contractual levels of service, agreed upon by the parties to the Administrative Contract, were delivered and in many cases outperformed. Water quality at consumer taps was 99.66% compliant with the standards in 2024, outperforming the quality level of 99.5% specified in the Administrative Contract. Also, the water loss rate continues to stay below the 20% limit. In 2024, the water loss rate of 13.67% was achieved. The number of blockages in 2024 was 441.

REQUIREMENTS FOR CONTRACTUAL PARTNERS

Given the strict requirements applicable to our activities, it is fundamental that our suppliers and contractors meet the environmental and health and safety requirements as well. Among other things, the contractors must confirm that they comply with health and safety and environmental protection requirements at our repair and construction sites. We have established several criteria in our procedures allowing us to have control over our partners with regard to our expectations. Our specialists monitor the health and safety and environmental performance in the activity of suppliers/contractors at sites on a daily basis.

MANAGEMENT SYSTEM CONTROL AND AUDIT

In May 2024, OÜ Bureau Veritas Estonia, accredited certifier, carried out a surveillance audit of the management system in the company. The aim of the audit was to assess the performance and compliance of the company’s quality management system, environmental management system and occupational health & safety system with the requirements of the standards ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and of the EMAS Regulation, with the statutory requirements of the industry and the documentation established in the company.

The audit verified that the company has established and implemented quality, environmental, and occupational health and safety management systems that take into account the requirements of the standards on which the audit was based. The management system helps the company to achieve its guiding principles and objectives and meet the applicable requirements.

An audit to verify the EMAS certificate was carried out in April 2024. The aim of the audit was to confirm the compliance of company’s environmental management system and environmental report with the requirements of EMAS Regulation (EC) No 1221/2009, amended with the Regulations (EU) 2017/1505 and (EU) 2018/2026. The audit did not establish any non-compliances. The audit report stated that the company's management system has been established and implemented taking into account the requirements of the EMAS Regulation on which the audit was based and is capable of meeting the applicable requirements and achieving the desired results.

We also have an ISO/IEC 27001:2017 certified information security management system in place since 2023 to more effectively operate and protect our information systems and infrastructure. The surveillance audit carried out in May 2024 did not establish any non-compliances.

Besides external audits, regular internal audits are carried out in the company to assess the performance of the management system. The internal auditors who audit the company's management system are usually company employees (except for information security, where we use external experts) who have undergone appropriate training to become internal auditors. All activities of the company covered by the management systems are audited at least once every three years. To ensure that internal audits are carried out systematically, a detailed annual plan is drawn up as to who audits what. The annual plan appoints auditors in such a way that they do not audit activities/processes for which they are directly responsible. The results from internal audits are managed in a central register of findings. The company's Quality Manager will ensure that all non-conformities and findings are resolved by the deadline.

In 2024, the Estonian Accreditation Centre carried out a surveillance visit to the company's laboratories to verify the compliance with the requirements of EVS-EN ISO/IEC 17025. The surveillance visit did not establish any non-compliances.

Environmental Education and Consumer Awareness

We keep working hard to promote an environmentally-conscious way of thinking and acting amongst our community members. We encourage people to drink tap water and explain how to handle wastewater in a way that is friendly to the environment. We highlight the stable quality of tap water that meets high standards and encourage our consumers to prefer tap water at home as well as when dining out. The public water taps are open for all Tallinners from the very first warm days of spring until the weather gets cold in autumn. In 2024, 12 new water taps were installed along cycle and footpaths and health trails. In 2024, a total of 53 public drinking water taps were opened throughout the capital city. Locations of all public drinking water taps can be found here.

- We work consistently to ensure that children grow up environmentally conscious and learn to treasure the nature. Each year, we organise water-themed discussion groups in kindergartens and schools, discussing matters relating to water cycle, sustainable water consumption and sewer blockages. In 2024, water- and environment themed discussion groups were conducted with a total of 841 children.
- In 2024, we organised open house events and tours at the Water Treatment Plant at Ülemiste and Wastewater Treatment Plant at Paljassaare. A total of 340 people attended the open house events and 1,205 people, mainly school students, took part in the tours at the plants.
- In 2024, we attended several community events across Tallinn with our educational materials, including Tallinn Old Town Days, Family Day at Nõmme Snow Park, Safety Information Day for kindergartens in Lasnamäe, and the Run around Lake Ülemiste. Public events provide an opportunity to meet our consumers and customers and discuss how to become an environment-friendly water user and prevent sewer blockages.
- We provided refreshing drinking water at many events, such as the Investment Festival, Tallinn Old Town Days, Summer Day of the Association of Large Families in Tallinn and Harju County, Tallinn Maritime Days, Kalamaja Days, Tallinn Urban Space Festival and KopliFest, and a number of sporting events, such as the 52nd Run around Lake Ülemiste, IRONMAN Tallinn and the Kõrvemaa Cycling Marathon.
- In 2024, we participated again in Open House Tallinn, an architectural event that invites people to discover urban space. We opened to the public the oldest part of the Ülemiste Water Treatment Plant, which is the first functionalist building in Estonia, completed in 1927, and one of the finest achievements of industrial architecture in the 1920s. Introducing the history, we also talked about the importance of having clean drinking water both today and in the future.
- We were present with our materials and stand at Impact Day, a sustainability festival promoting environmental education, where we made people think about the importance of tap water as drinking water and talked about the positive impact tap water has on the environment.
- In the summer of 2024, we once again explained to our consumers why it is important to save clean drinking water and reminded them that it is best for the environment to use rainwater to water the garden.
- Environmental protection and behaviour that values nature is important to us and we also want to improve the awareness of our employees on these topics. In May 2024, we organised an environmental awareness month, which has already become a tradition, to promote environmental awareness among our employees. We encouraged our employees to take part in a nationwide "Let's Do It!" clean-up day. Everyone also had the chance to take part in a competition to come up with clever solutions for recycling, and to take part in a hike around Lake Ülemiste. As part of the environmental awareness month, we held a workshop on making insect houses to create habitats for beneficial insects. We also asked all staff to complete an online training course on waste sorting. Alongside with our environmental awareness month activities, we took part in World Clean-up Day in September, cleaning up the area around the Paunküla reservoir, and participated in the World Car Free Day.
- Over the years, we have developed a range of educational materials on water and the environment. All materials are available on our website.

Quality and Use of Water Resources

ENVIRONMENTAL PROTECTION PERMITS FOR SPECIAL USE OF WATER

Our activities in using water resources are regulated by the Water Act and its implementing acts. As a water company we must hold environmental protection permits and pay environmental charge for the water resources we have used. The permit sets us certain obligations and restrictions. For instance, it determines the allowed water abstraction volume (m^3), obligation of keeping account over the amounts of water used, requirements for sampling, monitoring and analysis, as well as the allowed limit values for pollutants in effluent, requirements for monitoring of pollutants and measures to reduce the impacts arising from special use of water.

All requirements established in the permits were met in 2024. The water abstraction charge is paid for the amounts of water taken from Lake Ülemiste into the water treatment plant and for the groundwater pumped from the aquifers. In 2024, the water abstraction charge amounted to 3.4% of the costs of goods/services sold (2023: 3.4%)

Table 5: PERMITS IN PLACE IN 2024, REGULATING THE SPECIAL USE OF WATER, ISSUED TO AS TALLINNA VESI

Number of environmental protection permit	Valid until	Description of environmental protection permit
L.VV/331954	31/12/2030	**Licensed territory of public water supply and sewerage system in Saue City** Groundwater abstraction from four boreholes, over 5 m^3/day.
KL-506050	unlimited validity	**Main licensed territory of public water supply and sewerage system in Tallinn, Tallinn surface water catchment system facilities' area in Harju and Järva Counties** Regulating surface water resources in water bodies of Ülemiste-Pirita-Jägala surface water system, surface water abstraction from Lake Ülemiste, groundwater abstraction from Ordovician-Cambrian, Cambrian-Vendi and Quaternary aquifers, and stormwater discharge into the receiving water.
L.VV/328349	unlimited validity	**Licensed territory of public water supply and sewerage system in Maardu City** Abstraction of drinking water and water for industrial use from Cambrian-Vendi aquifer to supply water to Maardu City and areas in Kallavere and Muuga, and stormwater discharge into the receiving water.
Integrated environmental permit No KKL-509326	unlimited validity	**Paljassaare Wastewater Treatment Plant** Regulating the discharge of biologically treated effluent into the Bay of Tallinn, using a deep-sea outlet, and the use of emergency overflows.
KL-519983	15/09/2024	**For the reconstruction of fish pass on Vaskjala dam**

WATER CATCHMENT

Approximately 90% of our consumers in Tallinn and Maardu get their drinking water from surface water resources. Even though Lake Ülemiste is the main drinking water source for people in Tallinn, the natural catchment of the lake itself is small. To increase the water volume and ensure that the needs of City of Tallinn are met, we have established a water catchment system, which consists of hydropoints and water reservoirs built on rivers, and channels connecting those. Our water catchment system mainly comprises Harju sub-basin and the river basins of Soodla, Jägala and Pirita rivers, with a total area of ca 1,800 km^2. The most important reservoir is Lake Ülemiste with a volume of 15.8 million m^3. Paunküla water reservoir on the headwaters of the Pirita River (9.9 million m^3) and Soodla water reservoir on the Soodla River (7.4

million m³) supply additional water resources for Lake Ülemiste and can also be used if there is a need to improve the raw water quality in Lake Ülemiste.

The volume of water reserves in Tallinn surface water catchment system primarily depends on the annual amount of precipitation. Continuous information on the flows enables us to use the water resources most efficiently. To regulate the water resources in an optimal and accurate manner we have established water metering units at all hydropoints, which enable us to meter the flows conducted to the channels as well as the sanitary flows in the rivers. The measurements are carried out on a regular basis in accordance with the requirements of the environmental permit.

The year 2024 was generally characterised by unstable and inconsistent weather. Average air temperatures were above normal and very unstable across months. The same can be said for precipitation, which was unevenly distributed throughout the year. The winter was warm. In the first quarter of the year, the weather was warm and precipitation was moderate, with both snow and rain. The second quarter was warmer than usual, but April also saw snow and a cold spell. May was dry, while June saw moderate rainfall. The third and fourth quarters were characterised by uneven precipitation.

The average flows in the rivers of the catchment from the beginning of 2024 until mid-May were rather uniformly high compared to normal. The winter was very unstable in terms of precipitation and, due to warm temperatures, the snowmelt also kept the flows consistently high throughout the winter. Reservoirs and rivers developed permanent ice cover in January, depending on the flow rates in them. In February, the ice conditions changed somewhat, as thaws and rains melted the ice in the reservoirs. While Lake Ülemiste still had ice cover at the beginning of March, by the end of the month, the lake was ice-free at the edges. By April, Lake Ülemiste was completely free of ice, as were all the reservoirs.

In the autumn, partial ice cover on Lake Ülemiste occurred only on 10 December and full ice cover on 15 December, while ice cover on reservoirs also occurred in mid-December and was very irregular until the end of the year.

The level of water in Lake Ülemiste was maintained at the required level throughout 2024, mainly by channelling the free flows of the Jägala and Pirita rivers in the catchment into the lake. In early and late July, there was some intake from the Soodla reservoir. The normal pool level in the reservoirs was restored in autumn. No water was taken from the Paunküla reservoir and no water was pumped into it from the Jägala River.

A water metering unit was installed on the dam of Vaskjala, allowing precise measurement of small flows.

USE AND QUALITY OF SURFACE WATER

According to the environmental permit No KL-506050, the company is allowed to abstract up to 47.60 million m³ of surface water per year from Lake Ülemiste. The actual surface water abstraction in 2024 was 26.65 million m³. Water abstraction has increased in recent years mainly due to the increase in consumption.

Table 6: SURFACE WATER ABSTRACTED FROM LAKE ÜLEMISTE AND COMPLIANCE WITH ENVIRONMETAL PROTECTION PERMIT NO KL-506050, million m³

	2020	2021	2022	2023	2024
Surface water abstracted from lake Ülemiste	25.24	25.85	26.60	26.34	26.65

Maximum amount permitted is 47.6 m³/year

Water quality in surface water sources is monitored in line with the program determined by the environmental protection permit. We take raw water samples from the intake of our water treatment system on a daily basis to ensure compliance. Nitrogen and phosphorus compounds and total organic carbon are determined in raw water once a week. Furthermore, an in-depth analysis of raw water is carried out once a month in accordance with the quality monitoring programme established for a drinking water source. We study the results of the analyses to understand the changes and processes in the catchment area and decide upon the necessity to replenish the water stock in the lake.

Table 7: WATER QUALITY IN LAKE ÜLEMISTE IN 2020–2024

Parameter	Unit	Average results

		2020	2021	2022	2023	2024
Colour	mg/L Pt	39	37	33	32	43
Turbidity	NTU	6.9	6.2	7.0	6.7	6.2
pH	0	8.43	8.22	8.12	8.16	8.17
Oxidisability (COD_{Mn})	mg O_2/l	11.1	10.1	9.7	9.7	11.3
Total organic carbon (TOC)	mg C/l	11.0	10.4	10.2	10.0	11.3
Total phosphorus	mg/l	0.048	0.029	0.029	0.026	0.019
Total nitrogen	mg/l	1.43	1.20	1.27	1.39	1.45
Ammonium	mg/l	0.019	0.085	0.071	0.063	0.078
Phytoplankton abundance	objects/ml	16,804	21,975	164,000	6,974	15,236

The abundance of phytoplankton depends on their species composition. The abundance of phytoplankton can also be affected by extreme weather conditions during the summer period, causing their abundance to vary from year to year.

USE AND QUALITY OF GROUNDWATER

Approximately 10% of consumers in Tallinn are supplied with water abstracted from the Cambrian-Vendian and Cambrian-Ordovician aquifers. In our licensed territory, groundwater is supplied in Saue City and districts of Nõmme, Laagri, Merivälja, Pirita and Tiskre in Tallinn. A total of 2,646,4 m^3 of groundwater was abstracted in 2024.

Table 8: USE OF GROUNDWATER AND COMPARISON WITH MAXIMUM VOLUMES SET BY PERMITS FOR A SPECIAL USE OF WATER, thousand m^3

Number of environmental protection permit	Maximum volume permitted	Average results				
		2020	2021	2022	2023	2024
Tallinn (Permit no KL-506050)	7,749.80	2,400.4	2,603.6	2,367.5	2,294.7	2,305,7
Saue (Permit no L.VV/331954)	445	331.2	350.0	364.4	359.3	340.5
Maardu (Permit no L.VV/328349)	720	3.1	0.1	0.2	1.8	0.2

According to the EU Water Framework Directive (2000/60/EC), the qualitative or chemical conditions of groundwater are regarded to be good if the concentration of pollutants does not indicate any inflow of salty water or other water, nor exceed the quality standards applicable by law. In 2024, the quality of drinking water at the borehole pumping stations complied with the requirements of the Regulation No 61 issued by the Minister of Social Affairs. There were no groundwater pollution incidents or potential pollution incidents demanding us to notify the City of Tallinn and the Estonian Health Board.

We monitor the groundwater quality parameters in accordance with the environmental protection permits, and if necessary, the groundwater undergoes a treatment process. On a monthly basis we monitor the treated groundwater quality (content of iron, manganese, and ammonium) in 21 groundwater pumping stations, which have filters installed and continuously provide water to the public network. All currently operated borewells are equipped with automatic hydrostatic pressure sensors allowing to measure the static and dynamic level of groundwater. Those results enable us to assess the recovery of groundwater resources. Over the last years, this trend has been positive, indicating the recovery of resources. By the end of 2024, we had also installed 16 UV-devices in the pumping stations to ensure the microbiological purity of the water.

Groundwater in Northern Estonia (Cambrian-Vendian aquifer) contains natural radionuclides. The natural radioactivity of Estonian groundwater has been thoroughly studied by Eesti Geoloogiakeskus OÜ as well as by the Radiation Monitoring Bureau of the Estonian Environmental Board. Repeated radiological analyses in all borewells are carried out every ten years, in accordance with the requirements.

Drinking Water Production and Quality

In 2024, we supplied 28.38 million m^3 of pure drinking water to our consumers. Drinking water quality is required to comply with the Regulation No 61 "Quality and Control Requirements and Analysis Methods for Drinking Water", issued by the Minister of Social Affairs on 24 September 2019 (hereinafter referred to as the Regulation No 61), originating from the Estonian Water Act and the European Union's Drinking Water Directive 98/83/EC. The water quality is monitored in accordance with the monitoring programmes approved by the Northern Regional Department of the Estonian Health Board. Samples are taken from the raw water (Lake Ülemiste, its catchment area, and groundwater), treatment process, water tanks at the groundwater pumping stations as well as the customer taps. The quality indicators of the drinking water supplied from the Water Treatment Plant at Ülemiste as well as the drinking water supplied from groundwater resources in 2024 are available on the website of AS Tallinna Vesi and in the information system of the Health Board.

Water analyses are carried out by the company's water and microbiology laboratory, which is one of the largest water laboratories in Estonia. The quality of analyses is guaranteed both by certified samplers and laboratories accredited with the quality management system (EVS-EN ISO/IEC 17025 standard), modern equipment and professionals. In 2024, our water and microbiology laboratory performed a total of 109,000 analyses.

SURFACE WATER TREATMENT PROCESS

Water abstracted from the lake is treated at the Water Treatment Plant at Ülemiste, using a treatment scheme widely used throughout the world. Due to the quality of surface water in Lake Ülemiste and to ensure the drinking water quality, the surface water must undergo mechanical and chemical treatment, including preliminary ozonation, coagulation, clarification, filtration, and disinfection. In 2024, the full reconstruction of the extensive ozonation process was started. In the future, the plant will produce ozone from liquid oxygen, making it much more efficient.

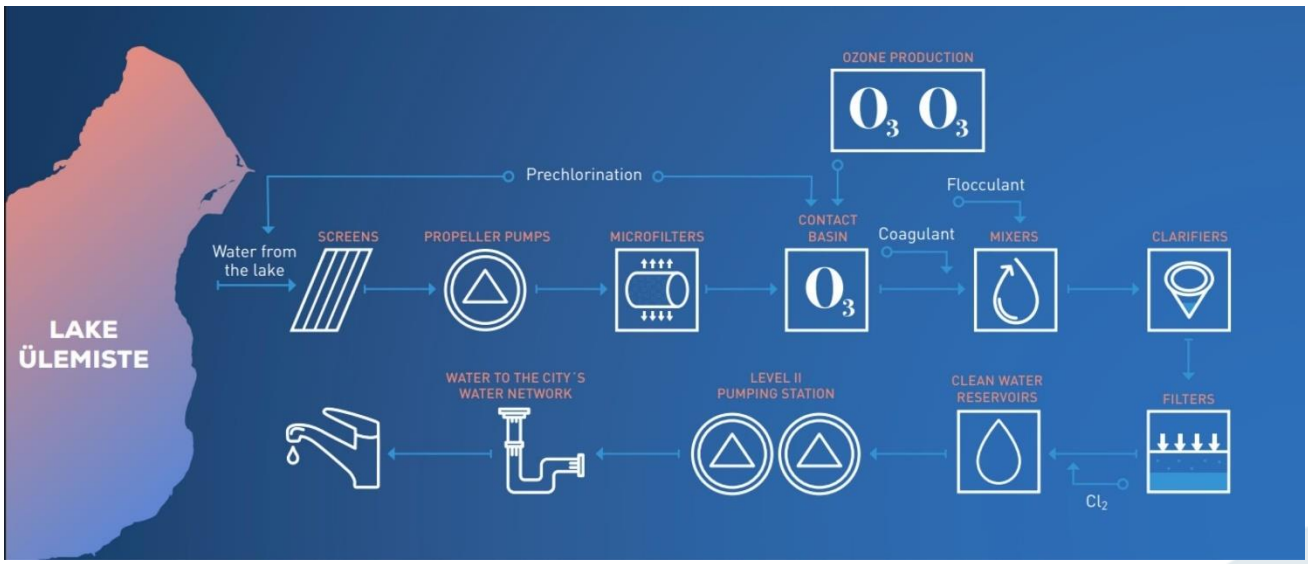


Figure 2: Water treatment process at the Ülemiste Water Treatment Plant.

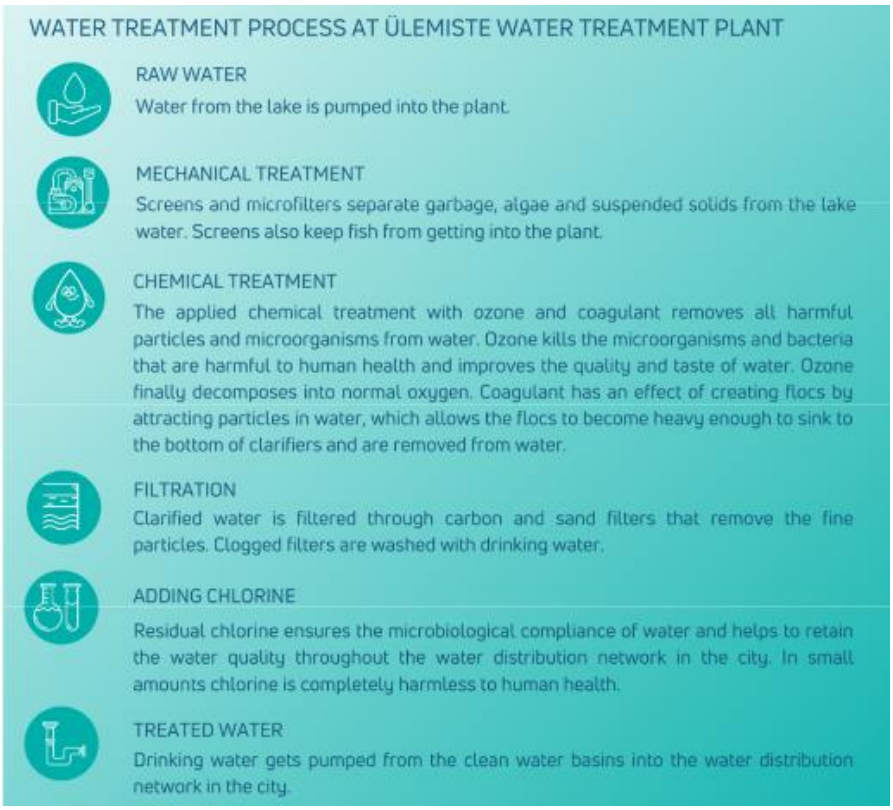


Figure 3: Description of water treatment process at the Ülemiste Water Treatment Plant.

GROUNDWATER TREATMENT

The Water Act requires that the status of groundwater be maintained as similar to its natural conditions as possible, therefore, as a rule, no chemicals are used in treating groundwater. To supply compliant drinking water, we treat groundwater by filtration and aeration to remove excess iron, manganese and ammonium from the water. Samples taken after the groundwater treatment process show that the treatment significantly reduces the turbidity as well as concentrations of ammonium, iron and manganese, improves the colour and stability index, and increases the oxygen concentrations in water.

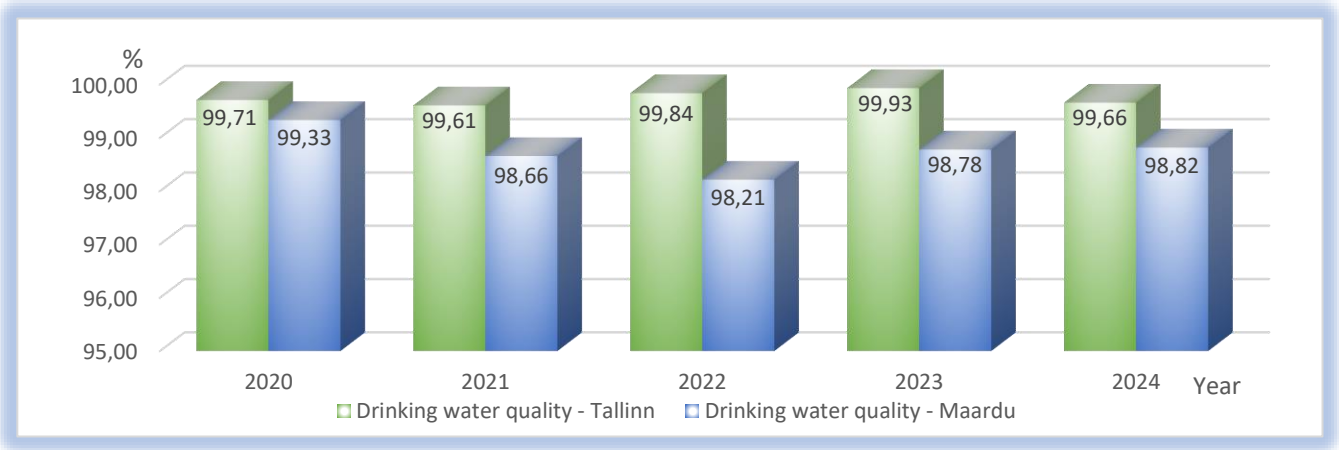
DRINKING WATER QUALITY IN THE WATER NETWORK AND AT CUSTOMER PREMISES

The quality of drinking water in Tallinn and Maardu remains excellent. Throughout the year, we took samples at the sampling points (at customer premises), which had been specified based on the monitoring programs approved by the Estonian Health Board, twice a month.

In 2024, we took a total of 2,943 samples across the licensed territory in Tallinn (besides Tallinn also in Saue). The quality of drinking water taken from the customer taps was 99.6% compliant with the requirements. Consistently high quality of tap water is ensured with the ongoing development and maintenance of the water network across the licensed territory.

98.8% of the 169 water samples taken in Maardu in 2024 complied with the requirements.

Chart 2: DRINKING WATER QUALITY COMPLIANCE WITH REQUIREMENTS SET OUT BY THE MINISTER OF SOCIAL AFFAIRS REGULATION NO 61 IN 2020–2024, %



WATER NETWORK MAINTENANCE AND RELATED INVESTMENTS

To maintain and improve the quality of drinking water, we carry out ongoing maintenance and rehabilitation work on the networks. For maintenance, the company has introduced a new ice-pigging technology, whereby water pipes are washed with ice slurry, which effectively removes sludge and biofilm from the pipes. Also, to ensure high quality drinking water for consumers, we regularly clean and flush the water network. In 2024, we cleaned a total of 193 km of water mains using ice-pigging and air-scouring methods, of which 141 km were cleaned by ice-pigging. We also continued to carry out a significant amount of flushing work to ensure the proper flow of water in the network.

Table 9: CLEANED WATER NETWORK IN 2020–2024, km

	2020	2021	2022	2023	2024
Cleaned water network	136	136	137	198	193

Investment in replacing old water pipes has helped to improve water quality for consumers and to use water resources more efficiently. Every year, we carry out significant rehabilitation work on our pipelines where needed, working closely with the City of Tallinn and other utility owners. This enables us to carry out the work simultaneously, reducing both the inconvenience to the city's residents (e.g. dust and noise) and the environmental impact (e.g. reduced material costs). Pipelines are rehabilitated in line with the public water supply and sewerage development plans.

The volume of pipeline rehabilitation work has almost tripled since a few years ago and will continue to grow in the coming years. In 2024, 45 km of water and wastewater pipes were rehabilitated, 41% of the rehabilitation work was carried out using no-dig methods.

LEAKAGES AND INTERRUPTIONS TO WATER SUPPLY

One of our key targets is to keep reducing water losses in the distribution network. The Administrative Contract applying to the licensed territory in Tallinn sets out the obligation for the company to reduce the water loss rate to 20%. We have managed to keep the water loss rate at a considerably lower level than required for several consecutive years, achieving 13.67% in 2024. However, the rate of water losses has increased compared to the previous year.

Table 10: WATER LOSS RATE IN DISTRIBUTION NETWORK IN 2020–2024, %

	2020	2021	2022	2023	2024
Water loss rate	12.42	15.00	16.02	12.93	13.67

The monitoring of daily water loss helps to find leakages as fast as possible and reduce the leakage rate. Our specialists use special equipment for finding leakages which, along with the zoning of network and remote reading system, allow faster detection of leakages in the network. In order to mitigate the inconveniences resulting from an interruption to the service, we try to notify our customers always in advance of any unplanned interruptions. In 2024, we gave prior notifications of unplanned water interruptions in 99.5% of the cases. As a provider of vital services, we deem it important to provide customers with a temporary water supply with water tanks in case of interruptions.

WATER METERING

The ultrasonic flow meters we install to measure water consumption are of high quality. All new water meters comply with the current European standards and European Measuring Instruments Directive along with the relevant accuracy requirements established therein. The expert studies and verification of water meters are performed by AS Metrosert, the national central office of metrology.

We have installed a total of 25,178 water meters to customers' connection points. Verified water meters allow accurate measurement of water consumption.

Under the currently applicable Metrology Act, we are required to organise the verification of the water meters every five years if the readings of those meters serve as the basis for billing between the water company and customers.

In line with the previously prepared plan, we changed a total of 5,410 water meters in 2024. We will continue our work in 2025 to make sure that all our customers have ultrasonic water meters that are verified on time.

In line with the expectations of various stakeholders, we started the mass deployment of remote reading water meters in 2022. These meters work on an ultrasound principle and in a Narrowband Internet of Things network. In addition to consumption data, the smart meters also provide information on faults and water leaks in an operational manner, thereby speeding up the response to leaks. At the end of 2024, smart water meters had been installed for 14,449 customers. The plan is to install smart water meters for all the customer, following company's regular water meter verification program, by the end of year 2026.

Collection of Wastewater

WASTEWATER NETWORK AND COLLECTION OF WASTEWATER

Wastewater is directed to the wastewater treatment plant through a combined sewer system that collects both sewage and stormwater. Some parts of our licensed territory are also covered with a separate storm system with stormwater outlets. However, most of the stormwater is collected to the combined sewer system and ends up at the Wastewater Treatment Plant at Paljassaare.

The condition of a wastewater network is well characterised by the number of blockages. Blockages are mainly caused by sediments build-up in the wastewater network or the misuse of wastewater network by consumers. Initially, the pipelines were sized for higher flows, so today's lower water consumption has led to reductions in flow rates and flow speed, which in turn increases the risk of blockages. Continuous expansion of the operated sewer network is also affecting the total number of blockages.

Table 11: NUMBER OF BLOCKAGES IN 2020–2024, pcs

	2020	2021	2022	2023	2024
Number of blockages	485	553	628	533	441

The number of blockages in 2024 was lower compared to 2023. We have been able to achieve a steadily good level of blockages in the recent years due to numerous preventive actions, including preventive jet washing of pipelines. Jet washing uses high pressure to generate a fast flow that carries sediments inside pipes into the nearest cesspool. Sediments are then collected by jet-washing trucks and transported to the Wastewater Treatment Plant at Paljassaare. There has also been significant rehabilitation of pipelines, largely based on the analysis of blockages.

SEWER DISCHARGE SERVICE

To serve the residents whose properties have not been connected to the sewer system, the company has provided two sewer discharge stations in Tallinn where septic trucks bring sewage from septic tanks. The availability of discharge stations helps to ensure that the sewage from septic tanks ends up at the wastewater treatment plant and gets treated to the required degree. Consequently, it diminishes the risk of environmental pollution that could, in the absence of a discharge station, result from discharging sewage in a manner and place not intended for such discharge. Since the second half of 2020, the company has wastewater meters in place in its sewer discharge stations to measure all the amounts of sewage discharged.

The sewer discharge services, delivering the sewage from septic tanks to the sewer discharge stations from where it ends up at the Wastewater Treatment Plant at Paljassaare, are provided by our partners in Tallinn. Although the number of residents in Tallinn not connected to the sewer system remains below 1%, the amount of sewage transported from the septic tanks in Tallinn and its neighbouring municipalities to our discharge stations still amounted to 51,735 m^3 in 2024.

POLLUTION LOAD FROM WASTEWATER AND STORMWATER

In order to ensure a stable pollution load in the wastewater entering the Wastewater Treatment Plant at Paljassaare, we regularly monitor the wastewater discharged from sites in Tallinn and Maardu as well as in the surrounding areas, and check the compliance of pollution parameters with statutory requirements. In 2024, we took a total of 1,047 wastewater samples to identify the wastewater pollution load at various sites and 223 stormwater and other samples for monitoring purposes.

In 2024, the level of precipitation in Tallinn was 695 mm per area unit on average, which is less than the year before in 2023 (824 mm).

Climate change is accompanied by a pattern of extreme weather events, such as dry periods followed by intense downpours. This presents us with a challenge in terms of storm water drainage, as densely populated areas dominated by paved surfaces can easily become flooded during heavy downpours. This is why we are continuously developing existing infrastructure, including separate sewer systems, combined with technical and near-natural solutions to make the urban environment more resilient to extreme weather conditions caused by climate change.

In 2024, we built 6.3 km of stormwater pipes. We also continued work on a project to divert some of the stormwater collected from the streets to an artificial wetland in Tondi Park, with a clearing area and a cascade, through a controlled water intake to prevent flooding and improve the quality of the water discharged to the Baltic Sea. Increasing the water's residence time will reduce the amounts of suspended solids and thus the levels of macronutrients and other pollutants in the stormwater before it is discharged to the outlet. To assess the effectiveness of the wetland, it is planned to install on-line monitoring systems to measure water quality parameters at the inlet and outlet.

Table 12: AMOUNTS OF STORMWATER IN 2020–2024, million m^3

	2020	2021	2022	2023	2024
Amount of stormwater	4.9	3.9	2.6	5.3	4.4

According to the requirements specified in the environmental permit, we monitor 29 stormwater outlets, of which Lasnamäe, Rocca-al-Mare and Mustjõe outlets are the largest. In order to achieve the targets of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention), we try to prevent and reduce possible damage to the marine environment from the release of pollutants or waste. Every year, we clean up stormwater gullies to prevent pollutants from reaching the sea. Starting from 2020, we carry out microbiological studies to detect illegal wastewater connections made to the stormwater system to reduce the amounts of pollutants in stormwater ending up in the receiving waters. Since 2015, we have also been monitoring the concentrations of hazardous substances in wastewater and in treated effluent.

Table 13: AVERAGE POLLUTANT CONCENTRATIONS FROM OUTLETS IN 2020–2024, mg/l

	Unit	2020	2021	2022	2023	2024	Limit value
BOD_7	mg/l	5.4	3.5	2.5	3.6	3.3	15.0
COD	mg/l	37.5	23.5	18.3	23.0	21.9	125.0
Oil products	mg/l	0.1	0.1	0.1	0.1	0.1	5.0
N_{Total}	mg/l	5.2	3.4	3.5	3.5	3.4	45.0
P_{Total}	mg/l	0.5	0.3	0.2	0.3	0.2	1.0
pH	-	8.0	7.9	7.9	7.8	7.8	6–9
Suspended solids	mg/l	30.1	14.8	10.5	16.1	13.9	40.0

The pollutant concentrations depend on the amount of precipitation, seasonal variation and the time of sampling.

Wastewater Treatment

Wastewater collected from Tallinn and its surrounding areas is treated at the Wastewater Treatment Plant at Paljassaare. We work hard to maintain high standards and outperform the requirements set for the treated effluent discharged into the Baltic Sea. A total of 51.48 million m^3 of wastewater was treated at the Wastewater Treatment Plant at Paljassaare in 2024.

Table 14: AMOUNTS OF WASTEWATER TREATED IN 2020–2024, million m^3

	2020	2021	2022	2023*	2024
Amount of treated wastewater	52.34	48.20	46.54	53.10	51.48

*We have corrected the amount of wastewater treated in 2023 in the 2024 report.

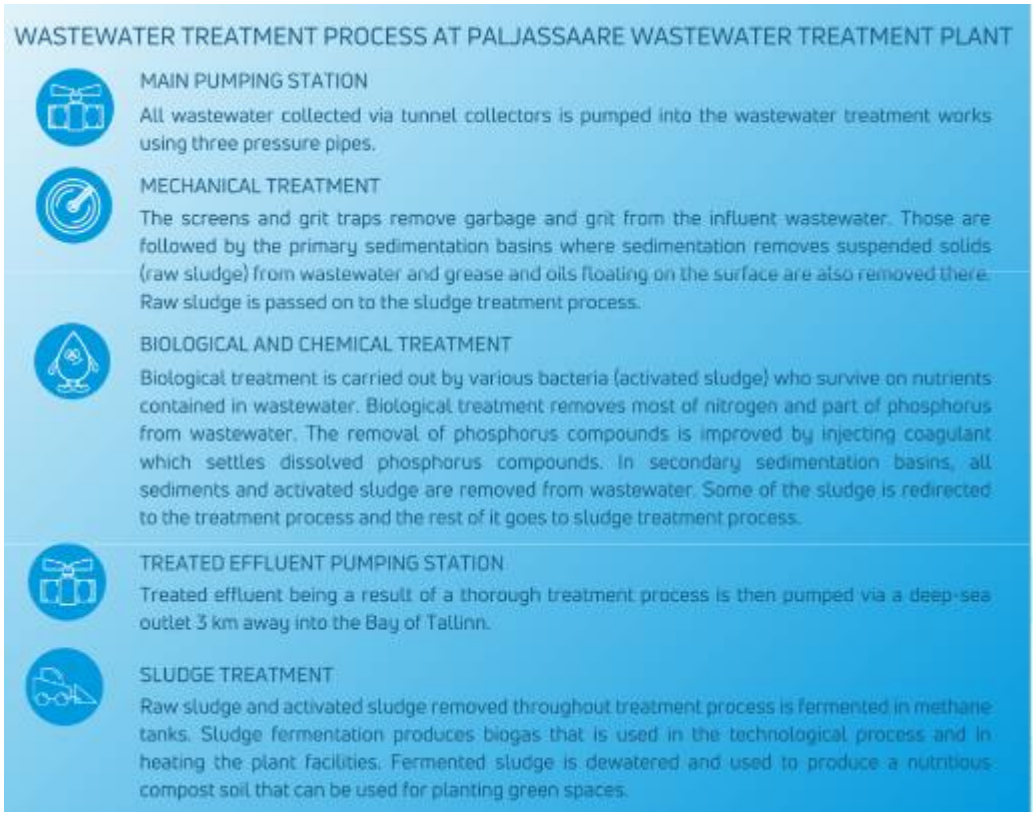


Figure 4: Description of wastewater treatment process at the Paljassaare Water Treatment Plant.

The pollutant parameters that are important for us include:

- **BOD_7** — biological oxygen demand shows the amount of oxygen it takes to decompose the organic matter in the course of 7 days;
- **COD_{Cr}** — chemical oxygen demand is an indicator of the decomposition of organic matter, measuring the amount of oxygen consumed in chemical oxidation of all the organic matter present in water;
- **SS** — suspended solids show the amount of solid matter in water which is caught in a filter with a defined mesh size;
- **N_{Total} and P_{Total}** — total phosphorus and total nitrogen are nutrient salts, which foster the growth of plankton in water. Nitrogen and phosphorus compounds serve as nutrients for plants, leading to the eutrophication of water bodies when present in high quantities;
- **oil products** — shows the amount of non-volatile oil products in water.

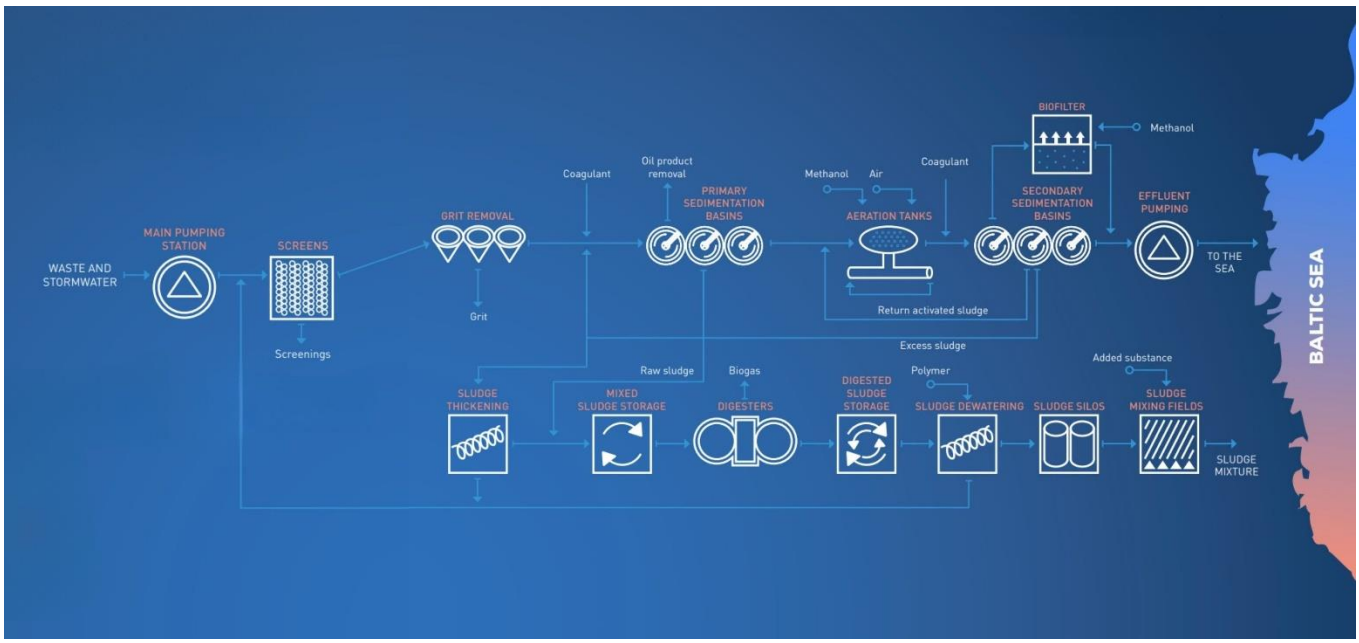


Figure 5. Wastewater treatment process at the Paljassaare Wastewater Treatment Plant.

In 2024, the volume of wastewater entering the treatment plant was lower than in 2023, but the levels of pollutants were higher. Due to momentary peak flows, situations may arise where the capacity of the treatment plant is temporarily exceeded. Exceeding the capacity of the wastewater treatment plant can in turn affect the efficiency of the treatment processes and the quality of the effluent, which is why the charts below show an increase in the quantities/concentrations of some pollutants compared to the previous year. Due to excessive rainfall, overflows must be used on occasion. In addition, hydraulic overloads disrupt biological processes because microorganisms need a normal residence time for effective treatment. As a result, the efficiency of total nitrogen removal remained unchanged compared to the previous year.

Chart 3: AMOUNTS OF POLLUTANTS RECEIVED AT THE WASTEWATER TREATMENT PLANT (blue) AND DISCHARGED FROM THE PLANT INTO THE SEA (green) IN 2020–2024, t/y

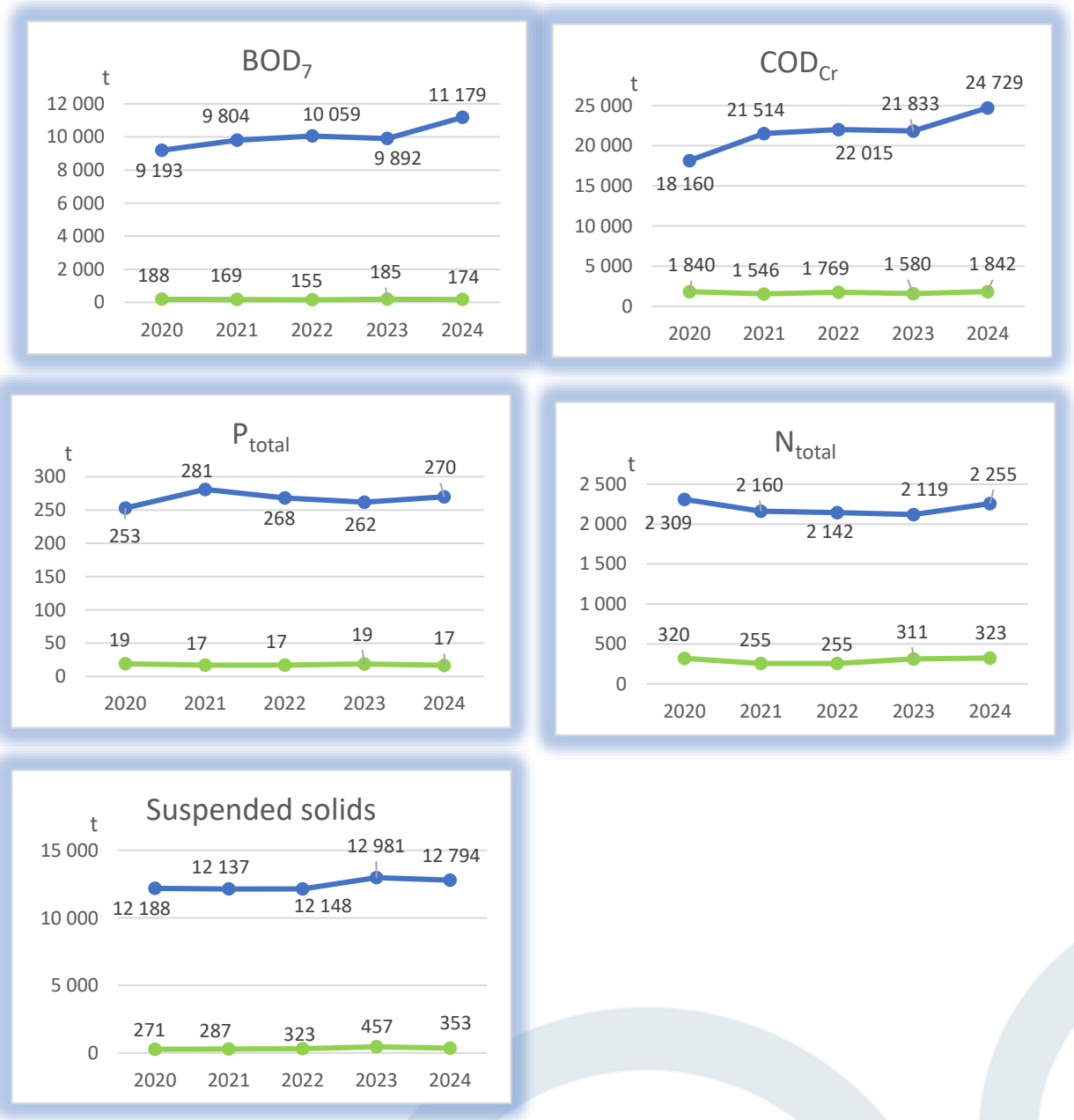
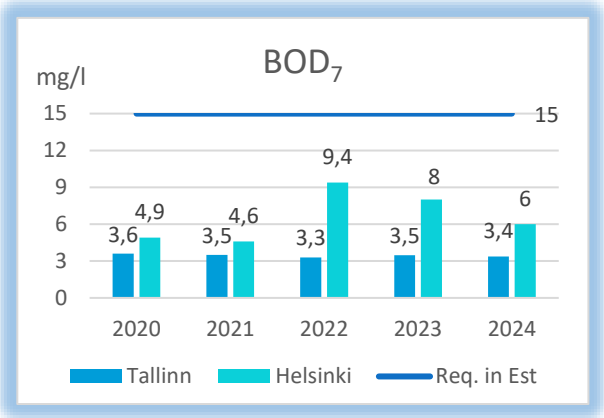
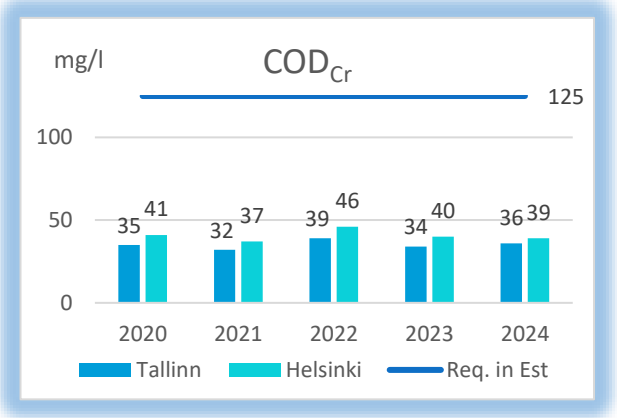
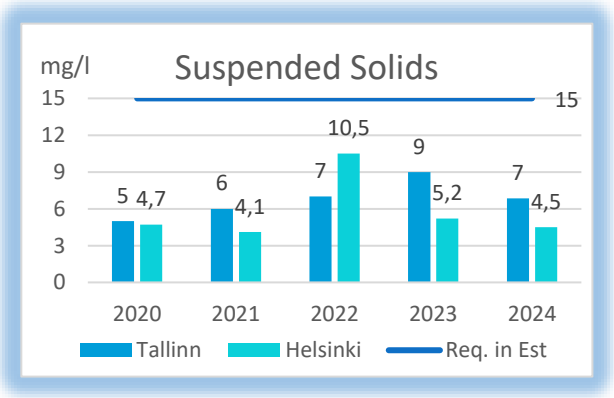
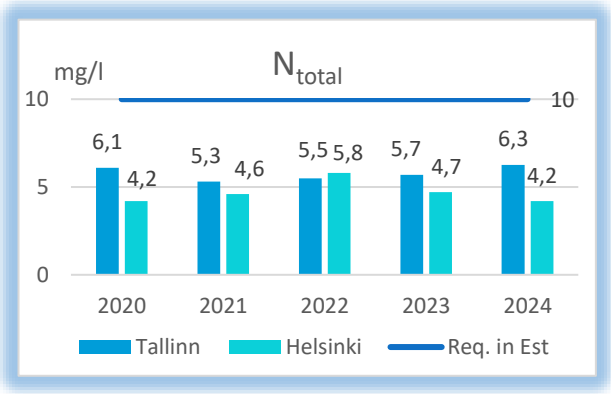


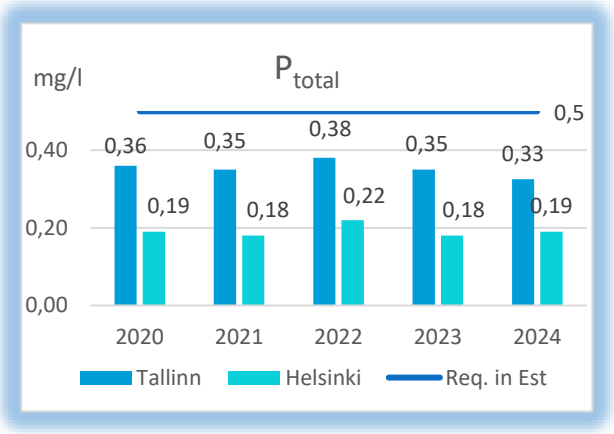
Chart 4: AVERAGE POLLUTION CONCENTRATIONS IN TREATED EFFLUENT IN 2020–2024, COMPARED TO MAXIMUM REGULATORY LIMITS AND PERFORMANCE OF HELSINKI HSY, mg/l











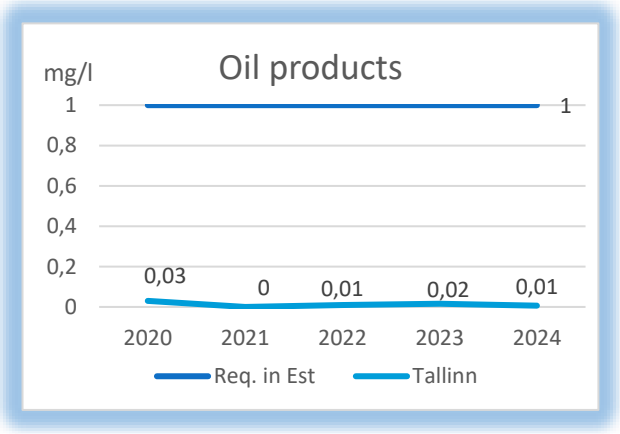
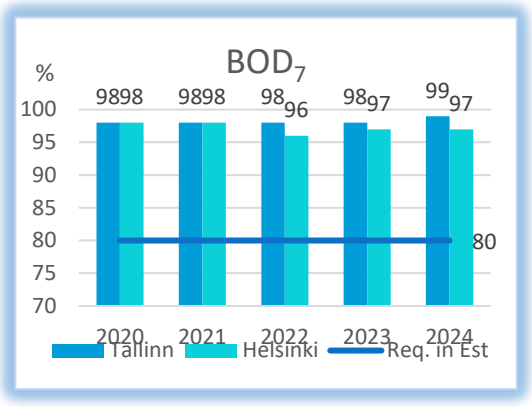
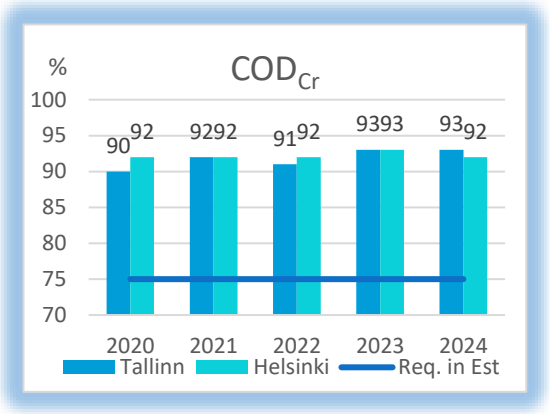
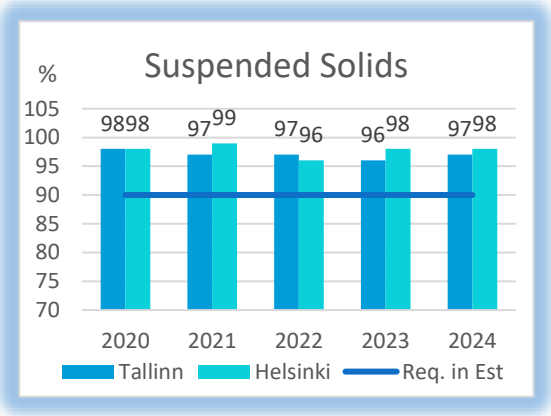
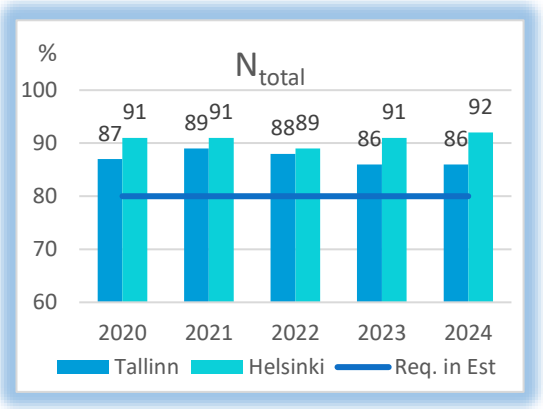


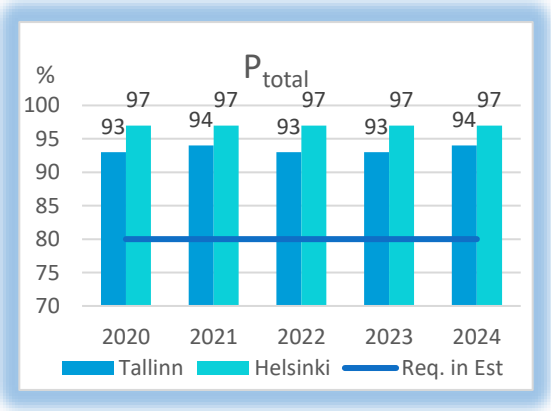
Chart 5: WASTEWATER TREATMENT PLANT'S TREATMENT EFFICIENCY IN 2020–2024, COMPARED TO MINIMUM REGULATORY REQUIREMENTS AND PERFORMANCE OF HELSINKI HSY, %

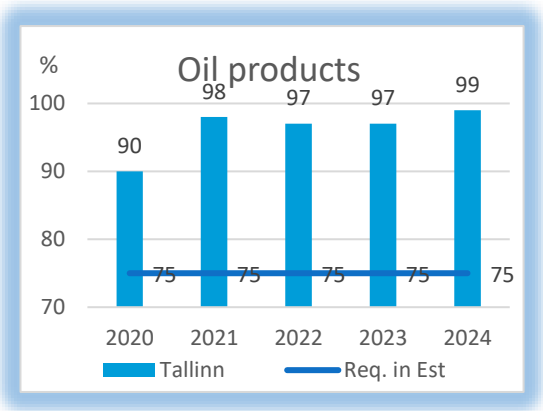












WASTEWATER DISCHARGED TO THE SEA

During 2024, a total of 211,649 m³ of wastewater diluted with stormwater was discharged directly into the sea due to exceptional weather conditions (at a ratio of at least 1:4). Due to shock loads exceeding the capacity of the biological treatment, a total of 688,473 m^3 of highly diluted and only mechanically treated wastewater was discharged into the sea through a deep-sea outlet in 2024.

Table 15: WASTEWATER TREATMENT PLANT OVERFLOWS IN 2020–2024, thousand m^3/year

	2020	2021	2022	2023	2024
Untreated wastewater discharged to the sea	234.1	288.2	0.0	211.1	211.6
Partially treated wastewater discharged to the sea	1 236	934	712	889	688

POLLUTION CHARGES

As a water company we are required to act in line with the environmental permits and pay pollution charges, the purpose of which is to prevent and reduce the potential damage caused by pollutants or waste released into the environment.

The calculation of pollution charge is established in the environmental permit and in the Environmental Charges Act, and applies to the pollutants contained in the effluent and stormwater at the particular outlets. Pollution charge calculations take into account both the receiving water coefficient of the specific outlet as well as compliance with the limit values set for pollutants. In 2024, the pollution charge paid for discharging pollutants into the receiving waters accounted for 2.7% of the cost of services sold (2023: 2.7%).

Use of Chemicals

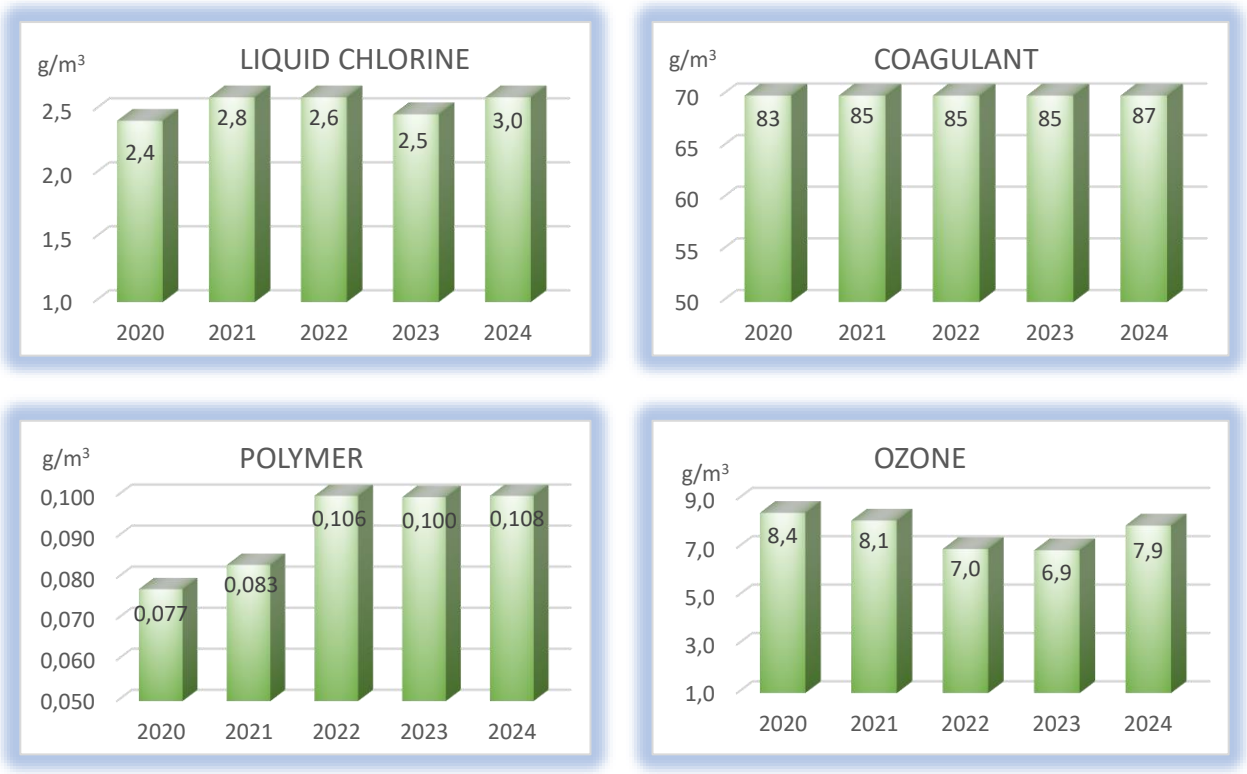
With regard to the health and wellbeing of our employees, safe handling of chemicals at the work site is extremely important for us. To this end, we have created the conditions necessary for safe storage and use of all chemicals. In 2024, we used a total of 5,999 tons of various chemicals (2023: 5,989 tons) in our operations, whereas no reported accidents with chemicals occurred which could have caused harm to people or the environment.

WATER TREATMENT CHEMICALS AND THEIR USE

- **Chlorine** is an effective disinfecting chemical with a long-term aftereffect. The Regulation No 61 (“Drinking Water Quality and Testing Requirements and Analysis Methods"), issued by the Minister of Social Affairs on 24 September 2019, specifies that the concentration of free chlorine added to the drinking water, produced out of surface water, can be up to 1.0 mg/l leaving the plant and up to 0.5 mg/l at consumer taps. We add chlorine in the final stage of the water treatment process to ensure the microbiological purity of the water and to help maintain water quality in the city’s water distribution network. Chlorine has a strong oxidising effect and is extremely poisonous for aquatic microorganisms. Due to the chlorine stored and used, AS Tallinna Vesi classifies as a company with the risk of category B major accident in Estonia. By applying the necessary safety measures, we have minimised the likelihood of chlorine accidents.
- **Ozone** is a good and quick oxidiser, which effectively breaks down organic matter and microorganisms in raw water and improves the colour of water. Ozone is produced locally on site from ambient air and only in necessary quantities. With a closed process and absence of stock reserve, the environmental risk is taken to minimum.
- **Coagulants and polymers** are chemicals we use in the treatment process in significant amounts and in liquid form. These chemicals are added within treatment to remove smaller particles (e.g., suspended solids and organic substance) from water. The coagulation process significantly reduces the concentration of organic matter in water.
- **Sodium hypochlorite (NaOCl)** is an effective chemical with a longer-term aftereffect, used by the company mainly during summer in additional disinfection of drinking water in water pumping stations. NaOCl is added to drinking water to ensure microbiological purity of the water and to help maintain water quality in the city’s water distribution network. Chlorine is added to the water before the water pumping station’s reservoir to allow adequate contact time for chlorine in the reservoir.

Water quality in Lake Ülemiste is strongly dependent on the weather. However, long-term observations have indicated periodic changes in water quality also over the years. The prolonged warm period in 2024 led to a microbiological proliferation in the lake, which put more strain on the treatment process of the water treatment plant. The high levels of ammonium in the lake early in 2024, combined with the prolonged warm period, have increased the use of chemicals in the treatment process.

Chart 6: AVERAGE USE OF WATER TREATMENT CHEMICALS PER UNIT OF PRODUCT IN 2020–2024, g/m³

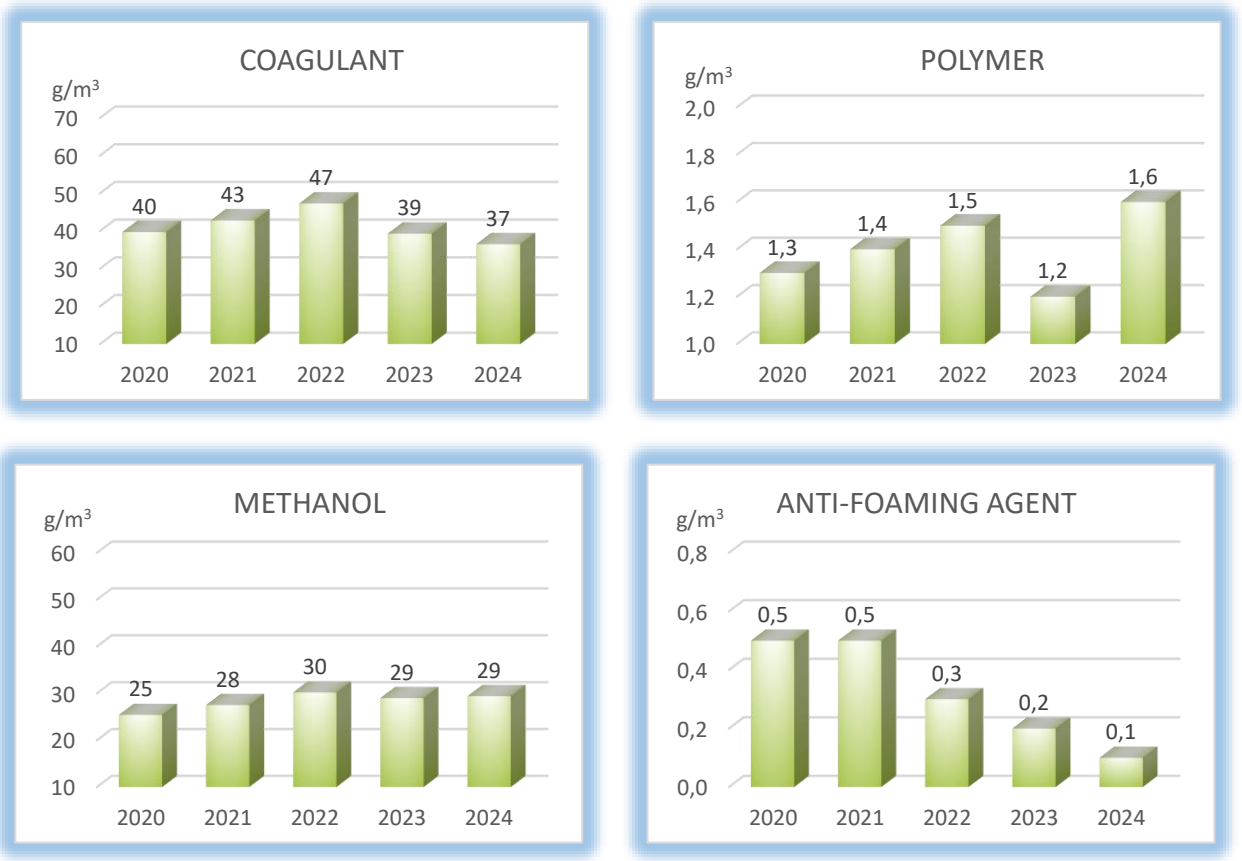


WASTEWATER TREATMENT CHEMICALS AND THEIR USE

- **Methanol** is used at the wastewater treatment plant to increase the nitrogen removal efficiency of the bacteria participating in the biological treatment process. Due to the extremely explosive methanol used in the wastewater treatment, AS Tallinna Vesi classifies as a hazardous company in Estonia.
- **Coagulants and polymers** are chemicals used in the wastewater treatment process in large quantities. Coagulants are used for the chemical treatment of wastewater to remove phosphorus. Polymers are used to change the characteristics of sludge by accelerating the dewatering process.
- **Anti-foaming agent** is used to remove foam in digesters.

The amount of chemicals used in the wastewater treatment process is dependent on the pollution levels of incoming wastewater, which in turn are affected by the weather. The higher the concentration of pollutants in incoming wastewater and the lower the regulatory limits for pollutants in the treated effluent, the higher is the amount of chemicals used in the wastewater treatment process. In 2024, the increase in the amount of polymer and the decrease in the use of antifoaming agent was due to the reconstruction of the digesters, which resulted in only one digester operating for most of the year.

Chart 7: AVERAGE USE OF WASTEWATER TREATMENT CHEMICALS PER UNIT OF PRODUCT IN 2020–2024, g/m³



Waste Management

WASTE GENERATION

A total of 48,201 tons of waste was generated in the company in 2024. Sludge from the wastewater treatment process and excavated soil and stones from the pipeline construction constitute the largest part of waste generated.

Table 16: MAIN TYPES AND AMOUNTS OF WASTE IN 2020–2024, t

Type of waste	2020	2021	2022	2023	2024
Mixed municipal waste	62.0	81.5	65.5	76.6	62.0
Paper and cardboard *	5.6	6.1	7.0	4.1	4.7
Packages *	1.5	1.5	1.5	1.5	1.7
Biodegradable waste*	7.8	7.1	6.8	8.5	11.5
Waste from screens	882.2	900.7	905.6	788.0	735.4
Wastewater sludge*	37,883.8	39,600.5	37,869.9	38,895.1	40,639.3
Sediments from grit traps	178.7	471.0	243.3	286.6	324.2
Excavated soil and stones	8,012.9	9,366.7	12,503.8	9,084.8	6340.9
Asphalt waste	179.9	130.8	137.8	68.1	35.8
Mixed building waste	2.3	7.0	47.5	13.8	9.2
Concrete and bricks	0.0	11.7	1.5	0.0	0.0
Metal scrap*	32.7	97.0	41.0	38.8	17.6
Hazardous waste	3.9	5.8	4.0	2.6	3.5
Other waste	6.3	17.0	17.8	10.9	15.4
Total	***47,259***	***50,704***	***51,853***	***49,280***	***48,201***

* - possible to reuse

Since the sewage sludge generated in the wastewater treatment process accounts for a very large proportion of the total amount of waste we generate, we continued to treat it further for recovery in 2024. Sludge stabilisation process (anaerobic digestion of sludge in digesters) produces biogas which is used for heating the buildings, as well as to produce heat and electricity needed in the technological process. We analyse the samples of greening soil made from sewage sludge at least four times a year, as required by the Regulation No 29, issued by the Minister of Environment on 31 July 2019. The results of the treated sludge analyses were publicly available on the company's website during the period when the greening soil was handed out.

In addition to sludge, the wastewater treatment process produces significant amounts of other types of waste, such as waste from screens, which we hand over to our waste handling partner. The amount of waste generated within the wastewater treatment process is directly affected by the incoming wastewater flows, the weather, and the efficiency of cleaning the streets and territories in the city. However, people also have an important role to play here as they can avoid throwing waste and hazardous substances into the sewers.

Excavated soil, stones, and asphalt waste account for the majority of waste resulting from the maintenance and repair work carried out on the networks. The amount of waste from construction and excavation work is again dependent on the amount of work. The volume of excavation work decreased in 2024, largely due to the fact that 41% of all sewer rehabilitation work was carried out using no-dig methods.

We collect and sort other types of waste, which account for a smaller proportion of the total amount of waste generated, and hand them over to waste handlers. Paper and cardboard, biodegradable waste, hazardous waste, metal, and mixed municipal waste are collected separately.

SEWAGE SLUDGE

The company has an integrated environmental permit (KKL-509326), issued in 2020, for handling the sewage sludge produced in the wastewater treatment process. The permit establishes technical and environmental requirements for the waste handling process.

Table 17: INTEGRATED ENVIRONMENTAL PERMIT ISSUED TO AS TALLINNA VESI

Number of integrated environmental permit	Valid until	Description
KKL-509326	indefinite term	Issued for the recovery of waste on composting fields at Paljassaare, procedure code R12o – biological treatment preceding the recovery of waste

In 2024, a total of 40,639 tons of stabilised sewage sludge were taken out from the wastewater treatment process and composted to produce the greening soil (by mixing with milled peat and applying aerobic digestion in windrows). In 2024, the company handed out 42,773 tons of sewage sludge that had been stabilised and had undergone aerobic digestion in composting windrows (hereinafter referred to as 'greening soil'). The main users of greening soil included companies Tubren Agro OÜ, Oru Agro OÜ and M8 Invest OÜ.

Table 18: AMOUNTS OF SEWAGE SLUDGE AND GREENING SOIL IN 2020–2024, t/y

Type of sludge	Quantities				
	2020	2021	2022	2023	2024
Sewage sludge taken out from the wastewater treatment process, stabilised and dewatered	35,200	39,395	37,870	38,895	40,639
Greening soil handed out (recovery of sewage sludge)	45,796	42,402	39,242	37,888	42,773

Energy Consumption

ELECTRICITY CONSUMPTION

The majority of electricity is used to run the company's core processes: operating the water treatment plant, wastewater treatment plant and pumping stations on the network.

Although we have been making significant investments aimed at reducing electricity consumption, the energy consumption is still inevitably and closely connected to the operation of our core processes. Those are in turn affected by changes in consumption and licensed territories, as well as by the natural conditions.

From the second half of 2021, we only use electricity produced from renewable sources at our facilities and in the treatment processes. At the end of 2023, a combined heat and power (CHP) plant installed at the wastewater treatment plant was commissioned, which enables to produce heat from biogas as well as most of the electricity used in the wastewater treatment process. In addition to using the energy generated from the wastewater to power the treatment plant, the energy will be also used to power the company's electric cars. In 2024, the CHP plant produced 7,235 MWh of heat and 8,168 MWh of electricity, with the electricity produced accounting for 18.8% of the electricity consumed by the company. Compared to the baseline year (2020) used in the Climate Impact Reduction Plan, electricity consumption has increased by 4.7%.

Table 19: ELECTRICITY CONSUMPTION IN 2020–2024, MWh

Unit	2020	2021	2022	2023	2024
Water Treatment	10,988	11,181	10,787	10,895	11,401
Wastewater Treatment	22,224	21,865	21,635	23,055	23,748
Networks pumping stations, incl. Maardu	7,554	7,602	7,159	7,622	7,519
Other	622	716	721	889	664
Total	***41,388***	***41,363***	***40,301***	***42,461***	***43,332***

Chart 8: ELECTRICITY CONSUMPTION PER UNIT OF WATER PRODUCED AT WATER TREATMENT PLANT IN 2020–2024, kWh/m³

The prolonged warm period in 2024 led to a microbiological proliferation in the lake, which increased the electricity consumption of the treatment plant.

Chart 9: ELECTRICITY CONSUMPTION PER UNIT OF WATER PRODUCED AT WASTEWATER TREATMENT PLANT IN 2020–2024, kWh/m³

Amount of electricity used in the wastewater treatment process depends largely on the weather. In wastewater treatment, electricity is mainly spent on pumping wastewater and producing air, i.e., aerating activated sludge in the biological treatment stage. In 2024, the wastewater entering the treatment plant had higher pollution levels and therefore the electricity consumption in the treatment process increased.

HEAT ENERGY CONSUMPTION

In addition to heating the premises, we also need heat energy to keep our core operations running. The water treatment plant was connected to the district heating network in the second half of 2024. Offices in Ädala Street also use central heating powered by natural gas. Most of the heat energy needed at the wastewater treatment plant is covered by biogas generated as a by-product on site.

Biogas is a by-product generated during the digestion of sewage sludge in digesters at the wastewater treatment plant. The second of the two digesters was reconstructed in 2024, and the final tuning of the equipment and process will be completed in 2025. The biogas produced is used to generate electricity and heat energy on site, which is then used to heat the wastewater treatment plant's premises and keep the operations running.

Before the CHP plant was installed, we had to combust part of the biogas or use small amounts of natural gas in addition due to the specifics of biogas production. In 2024, 77.7% of the biogas produced was directed to the CHP plant for the production of electricity and heat, while 21.9% was directed to the boiler house for the production of heat only. The remaining 0.4% had to be combusted due to technological downtime, which prevented the entire biogas production from being consumed by boilers or gas engines at any given time. In 2023, 42% of the biogas produced was combusted.

Table 20: HEAT ENERGY CONSUMPTION IN 2020–2024, MWh

Unit	2020	2021	2022	2023	2024
Water Treatment	2,685	3,206	3,215	3,202	3,035
Wastewater Treatment	14,311	12,092	11,776	10,765	11,810
incl. heat energy from biogas	14,217	11,991	11,688	10,655	11,761
Offices in Ädala Street	1,215	1,398	1,334	1,272	1,217
Total	***18,211***	***16,696***	***16,325***	***15,239***	***16,062***

Chart 10: BIOGAS PRODUCTION IN 2020–2024, thousand m³

TRANSPORTATION AND FUEL CONSUMPTION

Road transport accounts for the largest part of our need for transportation. We have a total of 112 vehicles to carry out a wide range of work and to travel between company locations and service sites. The largest group of vehicles are passenger cars and commercial vehicles, which also include minivans and team vehicles. In 2024, the company used 89 commercial vehicles and passenger cars and 23 other special vehicles (tractors, loaders, heavy-duty vehicles, etc.). In 2024, the company had 14 electric vehicles in use (1 electricity/petrol; 1 electricity/diesel). We will continue to purchase electric vehicles to reduce our carbon footprint, especially now that we generate our own electricity from wastewater. Electric cars will gradually replace older and more polluting cars.

Table 21: NUMBERS OF VEHICLES AND FUEL CONSUMPTION IN 2020–2024

	2020	2021	2022	2023	2024
Total number of vehicles, pcs	96	100	99	111	112
Petrol for vehicles, l	32,153	32,099	37,844	31,826	25,393
Diesel for vehicles, l	59,226	61,298	56,452	51,563	47,696
Fuel used by vehicles in total, l	**91,379**	**93,397**	**94,296**	**83,389**	**73,089**
Other petrol, l	4,015	3,306	3,237	2,652	2,354
Other diesel, l	96,430	96,095	119,266	86,456	37,108
Fuel used in total, l	**191,824**	**192,798**	**216,799**	**172,497**	***112,551***

*'Other petrol' and 'Other diesel' include fuel used by special vehicles. We have also retrospectively corrected the amount of 'Other diesel' in the 2024 report.

We continue to control the fuel consumption mainly through fuel limits set for car users and the GPS-tracking devices. Some of the cars are being shared by employees, i.e., all employees with specific authorisation are allowed to use the cars for their work assignments. This enables the company to cut down the costs and contribute to the saving of natural resources. Furthermore, all new cars we purchase meet current emission standard requirements. The number of business travel made by our staff inside and outside Estonia is relatively small.

Emissions to Air

Tallinna Vesi has been issued two environmental protection permits regulating emissions to ambient air. The pollution sources at the Ülemiste Water Treatment Plant are regulated by the environmental permit No KL-506050, while the pollution sources at the Paljassaare Wastewater Treatment Plant are subject to the integrated environmental permit No KKL-509326 from the second half of 2020, which regulates emissions to air from combustion units, grit traps, primary clarifiers, aeration tanks, secondary clarifiers, as well as from the sludge and composting fields. The company pays a pollution charge for the pollutants released into ambient air.

Table 22: ENVIRONMENTAL PROTECTION PERMITS ISSUED TO AS TALLINNA VESI, REGULATING EMISSIONS TO AMBIENT AIR

Number of permit	Valid until	Description
Environmental protection permit No KL-506050	indefinite term	Applies to the sources of pollution at the Ülemiste Water Treatment Plant – boiler house chimney, ozonation, diesel generator. Establishes the list of pollutants emitted to ambient air and their annual emission limit values.
Integrated environmental permit No KKL-509326	indefinite term	Applies to the sources of pollution at the Paljassaare Wastewater Treatment Plant, e.g., chimneys, ventilation pipes, composting fields, primary/secondary clarifiers, etc. Establishes the list of pollutants emitted to ambient air and their annual emission limit values.

Table 23: EMISSIONS TO AMBIENT AIR FROM POLLUTION SOURCES AT WATER TREATMENT PLANT IN 2021–2024, t

Pollutant	Limit value, t/y*	Limit value, t/y**	2021	2022	2023	2024
Nitrogen dioxide	1.954	1.446	0.855	0.894	0.698	0.349
Carbon monoxide	1.846	0.547	0.801	0.812	0.624	0.244
Volatile organic compounds	0.125	0.066	0.054	0.056	0.042	0.017
Carbon dioxide	1688	935.023	736.28	736.34	737.87	456.43
Sulphur dioxide	0.62	0.62	0	0	0.0047	0.004
Nickel	0.002604	0.002604	-	-	0	0.0000084
Fine particulate matter (PM10)	0.078	0.078	-	-	0.0028	0.004
Very fine particulate matter (PM2.5)	0.078	0.078	-	-	0.0028	0.004
Total solid particles	0.521	0.52	0.002	0.003	0.0042	0.0054

* Applied until 19/12/2024

**Applied from 20/12/2024

Table 24: EMISSIONS TO AMBIENT AIR FROM POLLUTION SOURCES AT WASTEWATER TREATMENT PLANT IN 2020–2024, t

Pollutant	Limit value, t/y	2020	2021	2022	2023	2024
Nitrogen dioxide	4.49	6.57	4.02	3.95	3.6	4.29
Carbon monoxide	3.15	6.21	2.82	2.76	2.52	3.01
Volatile organic compounds	14.50	3.96	14.45	14.41	14.35	14.22
Carbon dioxide	5789.49	5,715	5,262	5,167	4,710	5623
Hydrogen sulphide	3.82	14.1	3.7	3.7	3.7	3.55
Ammonia	79.34	19.9	79.3	79.3	78.5	79.31
Sulphur dioxide	11.98	3.3	11.2	10.9	10	11.92
Total solid particles	4.35	0.87	4.0	3.8	3.9	4.11

Environmental Performance Indicators

In line with the EMAS (Regulation (EU) 2018/2026) requirements, we have outlined below the core indicators characterising our performance in key environmental areas, such as energy efficiency, material efficiency, water, waste, biodiversity and emissions. At least three elements have been presented for each core indicator:

• a figure **A** indicating the total annual input/output in the given area;

• a figure **B** indicating the total amounts of pure water sold and wastewater and stormwater treated at the wastewater treatment plant throughout the year (million m^3);

• a figure **R** indicating the ratio A/B.

Table 25: ENVIRONMENTAL PERFORMANCE INDICATORS IN 2022–2024

Core environmental performance indicators	Year	Consumption (rounded), i.e., annual input (Figure A)	Annual output of the company (Figure B)	Ratio R (A/B)
Electricity				
Electricity consumption, MWh	2024	43,332	69.3	625
	2023	42,461	71.0	598
	2022	40,301	64.1	628
Heat				
Heat produced from natural gas, MWh	2024	2,022	69.3	29
	2023	4,585	71.0	65
	2022	3,303	64.1	51
Heat produced from biogas, MWh	2024	11,761	69.3	170
	2023	10,654	71.0	150
	2022	11,688	64.1	182
Chemicals consumption				
Liquid chlorine, t	2024	79	69.3	1.1
	2023	65	71.0	0.9
	2022	70	64.1	1.1
Coagulant, t	2024	4,186	69.3	60
	2023	4,316	71.0	61
	2022	4,463	64.1	70
Polymer, t	2024	183	69.3	2.6
	2023	178	71.0	2.5
	2022	144	64.1	2.2
Ozone, t	2024	211	69.3	30
	2023	182	71.0	2.6
	2022	185	64.1	29
Methanol, t	2024	1,510	69.3	22
	2023	1,535	71.0	22
	2022	1,404	64.1	22
Anti-foaming agent, t	2024	7	69.3	0.1
	2023	12	71.0	0.2
	2022	13	64.1	0.2
Water				

Water used in processes, thousand m^3	2024	2,624	69.3	38
	2023	2,601	71.0	37
	2022	2,318	64.1	36
Surface water abstraction, thousand m^3	2024	26,650	69.3	384
	2023	26,337	71.0	371
	2022	26,603	64.1	415
Groundwater abstraction, thousand m^3	2024	2,646	69.3	38
	2023	2,656	710	37
	2022	2,732	64.1	43
Waste				
Mixed municipal waste, t	2024	62.0	69.3	0.9
	2023	76.6	71.0	1.1
	2022	65.5	64.1	1.0
Recycled paper and cardboard, t	2024	4.7	69.3	01
	2023	4.1	71.0	0.1
	2022	7.0	64.1	0.1
Recycled packages, t	2024	1.7	69.3	0.02
	2023	1.5	71.0	0.02
	2022	1.5	64.1	0.02
Recycled biodegradable waste, t	2024	11.5	69.3	0.2
	2023	8.5	71.0	0.1
	2022	6.8	64.1	0.1
Waste from screens, t	2024	735	69.3	11
	2023	788	71.0	11
	2022	906	64.1	14
Sewage sludge, t	2024	40,639	69.3	586
	2023	38,895	71.0	548
	2022	37,870	64.1	590
Sediments from grit traps, t	2024	324	69.3	47
	2023	287	71.0	4.0
	2022	243	64.1	38
Excavated soil and stones, t	2024	6,341	69.3	91
	2023	9,085	71.0	128
	2022	12,504	64.1	195
Asphalt waste, t	2024	36	69.3	1
	2023	68	71.0	1
	2022	138	64.1	2
Mixed building waste, t	2024	9.2	69.3	0.1
	2023	13.8	71.0	0.2
	2022	47.5	64.1	0.7
Concrete and bricks, t	2024	0.0	69.3	0.0
	2023	0.0	71.0	0.0
	2022	1.5	64.1	0.0
Recycled metal, t	2024	17.6	69.3	0.3
	2023	38.8	71.0	0.5
	2022	41.0	64.1	0.6
Hazardous waste, t	2024	3.5	69.3	0.1
	2023	2.4	71.0	0.0
	2022	4.0	64.1	0.1

	2024	15.4	69.3	0.2
Other, t	2023	10.9	71.0	0.2
	2022	17.8	64.1	0.3
Biodiversity				
	2024	355.6	69.3	5.1
Total use of land (land owned by the company), ha	2023	355.4	71.0	5.0
	2022	355.4	64.1	5.5
	2024	118.1	69.3	1.7
Total sealed area, ha	2023	118.1	71.0	1.7
	2022	118.1	64.1	1.8
Emissions to air				
	2024	4.6	69.3	0.1
Nitrogen dioxide, t	2023	4.3	71.0	0.1
	2022	4.8	64.1	0.1
	2024	3.3	69.3	0.0
Carbon monoxide, t	2023	3.1	71.0	00
	2022	3.6	64.1	0.1
	2024	14.2	69.3	0.21
Volatile organic compounds, t	2023	14.4	71.0	0.20
	2022	14.5	64.1	0.23
	2024	6,079	69.3	88
Carbon dioxide, t	2023	5,448	71.0	77
	2022	5,903	64.1	92
	2024	11.9	69.3	0.17
Sulphur dioxide, t	2023	10.0	71.0	0.14
	2022	10.9	64.1	0.17
	2024	4.1	69.3	0.06
Total solid particles, t	2023	3.9	71.0	0.05
	2022	3.8	64.1	006
	2024	4	69.3	0.1
Hydrogen sulphide, t	2023	4	71.0	01
	2022	4	64.1	0.1
	2024	79	69.3	1.1
Ammonia, t	2023	79	71.0	1.1
	2022	79	64.1	1.2
Environmental education				
	2024	841	69.3	14.9
Number of children in the discussion groups	2023	1,035	71.0	14.6
	2022	960	64.1	15.0

Best Environmental Management Practices and Environmental Performance Indicators

The Environmental Report for 2024 takes into account the Commission Decision (EU) 2019/61, which sets out the best environmental management practices and environmental performance indicators for water metering, water leakages, energy-efficient wastewater treatment and energy recovery from wastewater treatment that are related to significant environmental aspects.

DEPLOYING WATER METERING

Water meters are installed for all consumers who have signed a contract. The water supply network is continuously monitored to allow quick reaction to any changes in the network. Consumers are invoice based on the water meter readings.

Table 26: ENVIRONMENTAL PERFORMANCE INDICATORS IN DEPLOYING WATER METERING

Environmental performance indicators[1]	Benchmarks of excellence[2]	Tallinna Vesi's environmental performance indicators
Penetration rate of water metering (% of consumers, % of water consumption covered by metering)	The penetration rate of water meters at household or final user level is 99% or higher	All consumers who have signed a contract have water meters installed
Percentage of smart meters among all water meters in use (%)	In areas of water scarcity (at least part of the year) (1), water meters at household/end-user level are smart meters	By the end of 2024, 60% of customers had smart meters installed. The target is to cover the entire service area with smart meters by the end of 2026.
Reduction in water use by final users after installation of water meters and/or smart meters (l/user)	All new buildings are equipped with water meters (smart meters in water-scarce areas)	All buildings have water meters

MINIMISING WATER LEAKAGES

In order to minimise water leakages, the water distribution system is continuously monitored:

1) carry out a detailed water balance of the water distribution system and manage water pressure, avoiding high levels: pumping stations are equipped with SCADA control system;

2) analyse the water distribution network and divide it into adequate district metering areas to detect water leakages: multi-zone sensors in use, which measure pressure, flow rates and noise;

3) respond promptly and adequately to the identified faults and leakages on the network: after detecting and locating the leak, information is transmitted momentarily to plan the repair;

4) establish a database to list and geo-reference all technical installations, the age of pipes, types of pipes, hydraulic data, previous interventions, etc.: Tekla geo-reference system in place, which collects the said data.

[1] Commission Decision (EU) 2019/61, published ELT L 17, 18.1.2019, page 35, i97); i99)

[2] Commission Decision (EU) 2019/61, published ELT L 17, 18.1.2019, page 35, b31); b33)

Table 27: ENVIRONMENTAL PERFORMANCE INDICATORS IN MINIMISING WATER LEAKAGES

Environmental performance indicator[3]	Tallinna Vesi's environmental performance indicator
Percentage of water loss out of the system input volume (%)	Water loss rate in the network was 13.67% in 2024

ENERGY-EFFICIENT WASTEWATER TREATMENT

According to the best environmental management practices:

1) at the average dry weather wastewater flow of 5,000 m^3/t, the capacity of the biological treatment is up to 14,000 m^3/t, which is twice the average dry weather wastewater flow;

2) wastewater is biologically treated at nitrifying conditions, performing nitrification and denitrification, as well as chemical phosphorus removal;

3) incoming wastewater and treated effluent discharged are monitored on a daily basis;

6) primary and excess sludge are stabilised in anaerobic digesters;

7) anaerobically stabilised sludge is dewatered;

8) energy-efficient fine bubble aeration systems in the biological stage and energy-efficient pumps are in use.

Table 28: ENVIRONMENTAL PERFORMANCE INDICATORS IN WASTEWATER TREATMENT

Environmental performance indicators[4]	Benchmarks of excellence[5]	Tallinna Vesi's environmental performance indicators
Concentrations in the discharged final effluent or removal efficiencies of COD, BOD_5, ammonia, total nitrogen and total phosphorus (mg/l, %)	Removal efficiencies achieved are: at least 98% for BOD_5, at least 90% for COD, at least 90% for ammonia, at least 80% for total organic nitrogen compounds, and at least 90% for total phosphorus	Removal efficiencies achieved in 2024: BOD_5* – 98%, COD – 92%, N_{Total} – 85%, P_{Total} – 93%
Electricity use of the wastewater treatment plant per mass of BOD_5 removed (kWh/kg of BOD_5 removed)	-	2.52 kWh/kg
Electricity use of the wastewater treatment plant per volume treated (kWh/m^3 of wastewater treated)	-	0.31 kWh/m^3
Annual electricity use of the wastewater treatment plant per population equivalents (PE) (kWh/PE/year)	Electricity use of the wastewater treatment plant is: 1) lower than 18 kWh/PE/year for large municipal wastewater treatment plants (with a size of more than 10,000 PE); 2) lower than 25 kWh/PE/year for small municipal wastewater treatment plants (with a size of less than 10,000 PE).	39.9 kWh/PE

[3] Commission Decision (EU) 2019/61, published ELT L 17, 18.1.2019, page 35, i100)

[4] Commission Decision (EU) 2019/61, published ELT L 17, 18.1.2019, page 36, i102); i103); i104); i105)

[5] Commission Decision (EU) 2019/61, published ELT L 17, 18.1.2019, page 36, b35); b36)

UNAEROBIC DIGESTION OF SLUDGE AND OPTIMAL ENERGY RECOVERY

Primary and excess sludge is stabilised in anaerobic digesters and biogas produced from sludge is used to heat the buildings and anaerobic digestion processes.

At the end of 2023, a combined heat and power plant was completed at the wastewater treatment plant. The CHP uses the biogas produced as a fuel and, under the best conditions, it will be able to cover the entire heat demand of the plant and at least one third of its electricity demand. Future plans include the installation of solar panels to further increase power generation capacity. In 2024, the CHP plant produced 7,235 MWh of heat and 8,168 MWh of electricity.

Table 29: ENVIRONMENTAL PERFORMANCE INDICATORS IN ENERGY RECOVERY

Environmental performance indicators[6]	Benchmarks of excellence[7]	Tallinna Vesi's environmental performance indicators
Percentage of electricity and heat needs of the wastewater treatment plant met by own-generated electricity and heat from biogas on an annual basis (%)	Own-generated electricity and heat from biogas cover 100% of the energy demand at municipal wastewater treatment plants with a size of more than 100,000 PE without on-site thermal sludge drying, and 50% in the case of plants with on-site thermal sludge drying	100% of heat and 34% of electricity
Electrical efficiency of the generator fuelled with biogas (%)	–	No generator
Specific biogas production (Nℓ/kg organic dry matter input)	–	No biogas valorisation

[6] Commission Decision (EU) 2019/61, published ELT L 17, 18.1.2019, page 37, i108); i109); i110)

[7] Commission Decision (EU) 2019/61, published ELT L 17, 18.1.2019, page 37, b39)

Significant Changes in the Environmental Report

At the beginning of 2025, we renewed the guiding principles of the company.

Compared to the significant environmental aspects in 2024, two changes have been made in the assessment of the environmental aspects in 2025. A new significant negative aspect was identified: noise and odour disturbances from the wastewater treatment plant. A new significant positive aspect was also identified: reducing pollutants in wastewater due to an efficient treatment process.

The amounts of wastewater treated in 2023 have been corrected in Table 14.

Amounts of 'Other diesel' for 2021-2023 have been corrected in Table 21. Accordingly, the carbon footprint figures in Table 4 and in Chart 1 were corrected.

In connection with the renewal of environmental protection permit No KKL-506050, the limits for emissions to air indicated in Table 23 were updated in 2024.

In connection with the introduction of CHP technology, the integrated environmental permit No KKL-509326 was renewed in 2024. This permit came into effect on 10/01/2025.

Validation of the Environmental Report

Bureau Veritas Estonia OÜ, an accredited verifier EE-V-0002, having inspected the Environmental Management System and the Environmental Report for 2024 of AS Tallinna Vesi, confirms that the information and data in the organisation's Environmental Report are reliable, credible and correct and meet the requirements of the Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme. The Commission Regulation (EU) 2017/1505 of 28 August 2017 and the Commission Regulation (EU) 2018/2026 of 19 December 2018 amending the annexes I, II, III and IV to the Regulation (EC) No 1221/2009 of the European Parliament and of the Council, have been applied to this report.

The Environmental Report has been validated on 06/05/2025

Janno Semidor

EMAS Verifier

Bureau Veritas Eesti OÜ