



2022
ENVIRONMENTAL
REPORT

tvo



Contents

TVO in brief.....	03
Review by the President and CEO	04
Strategy.....	05
Responsibility for the environment and climate.....	06
Environmental management.....	07
Effects of climate change on the business.....	09
Environment and energy efficiency programme	11
Supply of electricity in Finland and its climate impact	12
The environmental impacts of nuclear power.....	13
Environmental balance sheet	14
Finland’s greatest climate act.....	15
Cooling water.....	16
Raw materials and material efficiency.....	17
Production and energy efficiency.....	19
Releases into the air	22
Releases into water and soil.....	23
Waste.....	24
Environmental research and biodiversity.....	26
Cooperation with authorities.....	28
Final disposal of spent nuclear fuel	30
Sustainability contact persons.....	33
EMAS statement.....	34
Confirmation of compliance	35
Group-level policies	36





TVO in brief

Teollisuuden Voima Oyj (TVO) is a non-listed public limited liability company owned by Finnish industrial and energy companies. TVO's line of business is construction and procurement of power plants and power transmission equipment, as well as production, supply, and transmission of electricity, primarily to its shareholders under the terms specified in the Articles of Association.

TVO operates according to the cost-price principle (Mankala principle). TVO is owned by five shareholders, some of which – like TVO – operate according to the cost price principle. Electricity generated by TVO serves the needs of Finnish industrial and energy companies, some of which were owned by a total of 131 Finnish municipalities in 2022. The Olkiluoto nuclear power plant generates approximately 20 percent of all the electricity consumed in Finland.

TVO's operations are based on a strong safety culture and securing the safety of production. TVO's operational system covers production operations at the Olkiluoto nuclear power plant, maintenance and development of production capacity, construction of additional production

capacity, as well as related steering and resourcing operations. The system meets the requirements of international quality management, environmental, and health and safety standards, and it has been certified by DNV Business Assurance Finland Oy Ab. The general part of the operational system also acts as the licensee's quality management system approved by the Radiation and Nuclear Safety Authority (STUK).

The nuclear electricity produced in Olkiluoto plays a significant role in the economic development, electricity self-sufficiency, and general well-being of the whole of Finland. Nuclear electricity also plays an important role in the reduction of greenhouse gas emissions and the achievement of climate targets. The emissions generated by nuclear power are low: throughout the lifecycle, the greenhouse gas emissions remain at the same level as for hydropower and wind power. TVO is a major contributor to sustainable development and the mitigation of climate change.

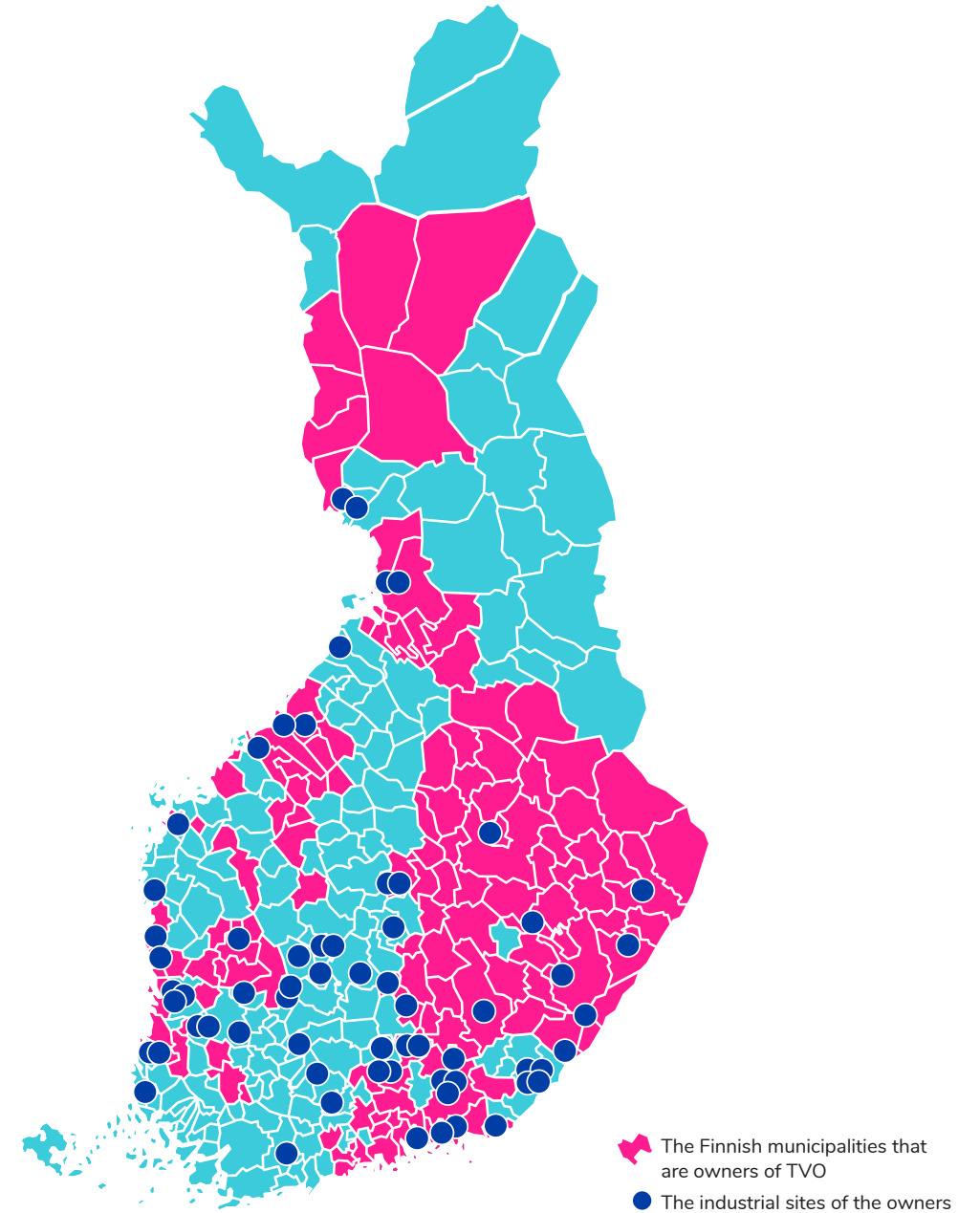
The objectives of TVO's strategy include a solid safety brand, predictable and competitive price of electricity, and satisfied customers. The goals are to maintain a competitive average electricity production

131

Electricity generated by TVO serves the needs of Finnish industrial and energy companies, some of which were owned by a total of 131 Finnish municipalities in 2022.

cost and to ensure that the operability of the plant units meets the Company's goals. The safety culture is maintained at a high level and safety is systematically upheld and developed at all stages of the nuclear power lifecycle.

The TVO Group comprises subsidiaries TVO Nuclear Services Oy (TVONS) and nuclear waste management company Posiva Oy (Posiva). TVONS is a subsidiary fully owned by TVO, providing services based on TVO's expertise and covering the entire lifecycle of a nuclear power plant. Posiva is jointly owned by TVO and Fortum Power and Heat Oy (Fortum), TVO's shareholding being 60 percent. Posiva is responsible for the final disposal of spent nuclear fuel generated at the power plants of its owners TVO (Olkiluoto NPP) and Fortum (Loviisa NPP). Posiva Solutions Oy (PSOY) is a fully owned subsidiary of Posiva, which sells Posiva's expertise generated through 40 years of multidisciplinary research.



Review by the President and CEO

Security of supply and self-sufficiency in focus

The start to the 2020s certainly cannot be said to be uneventful. First, COVID-19 made a mess of things for a couple of years and, just as things were returning to normal, war broke out in Europe. Naturally, both of these events have impacted the daily life also at Olkiluoto. Although this is quite literally a small island up in the north, our significance has certainly not decreased in recent times. Energy in general is now a more prominent topic of discussion than ever before.

I also wrote about the strong changes in the energy industry's operating environment in my previous review one year ago. The changes have continued, but new aspects have been introduced. Alongside the theme of climate change, which remains to be essential, there is now the energy price crisis in particular. Pretty much all of us have felt its effects in our electricity bills.

Without any exaggeration, it can be said that in last February, the European energy structures experienced a shock that disrupted their long-standing foundations

– perhaps even permanently. Now, less than a year later, the whole of Europe being dependent on Russian energy seems to have been a collective case of naivety. The Russian invasion of Ukraine was a surprise, even though there had been several advance indications of it. Security of supply and self-sufficiency were topics which had been discussed before, but understanding their importance was only now brought to the spotlight across Europe. In this big picture, the significance of nuclear power and TVO as a provider of steadfast nuclear power competence and predictable base load power that evens out the fluctuation of prices has reached new heights.

Furthermore, now the majority of Finns stand behind nuclear power with record-high numbers. Finnish Energy's "Energy Attitudes" survey is carried out twice per year and, in December 2022, the overall support for nuclear power reached a level of 83 percent, with 65 percent of Finns wanting to increase the amount of nuclear power and 18 percent considering that the current amount is appropriate. The support for nuclear power has grown in all demographics regardless of gender, municipality of residence, age, and political views.



Positive views on nuclear power have increased also elsewhere in Europe. In Sweden, for instance, the new government has shown thumbs up even for additional construction of nuclear power, and the topic has given rise to discussion in other countries as well. It could perhaps be said that many ideas put forward by the nuclear industry concerning the need for clean and reliable base load power have now been heard.

A contributing factor in the increasing support for nuclear power is surely also related to the fact that Finland, as the first country in the world, has solved the issue of the final disposal of spent nuclear fuel. Posiva's intensive scientific research, spanning more than four decades, has advanced to a point where Finland is beginning thoroughly researched, safe final disposal as the first one on this planet. This is a real "game changer", as Director General of the IAEA **Rafael Mariano Grossi** stated during his visit to Olkiluoto in 2020.

In late 2022, TVO was the subject of unprecedented media coverage. Naturally, this was due to Olkiluoto 3 being in the test production phase. The unit reached its full production power already early in the autumn, but eventually the start of



Although this is quite literally a small island up in the north, our significance has certainly not decreased in recent times."

actual commercial production had to be postponed to 2023. The cracks discovered in the feedwater pumps' impellers came at perhaps the most unfortunate time. On the other hand, this is a good demonstration that we take no safety risks whatsoever with nuclear power. Challenges that emerge during test production must always be thoroughly investigated so that similar incidents can be avoided in the future. Production tests carried out at the end of the year already went well, and the plant unit is operating according to plan. All this work carried out during test production is part of the responsibility that has always been at the core of all operations in the nuclear power industry.

For us, responsibility is rooted in the Group strategy, which also reflects the transformational forces of the operating environment, such as the energy price crisis and climate change. Predictable, competitive, and climate-friendly electricity production, safety in all our operations, and an energetic work community are aspects through which TVO strives to be, according to its vision, a valued pioneer of the nuclear industry.

Jarmo Tanhua



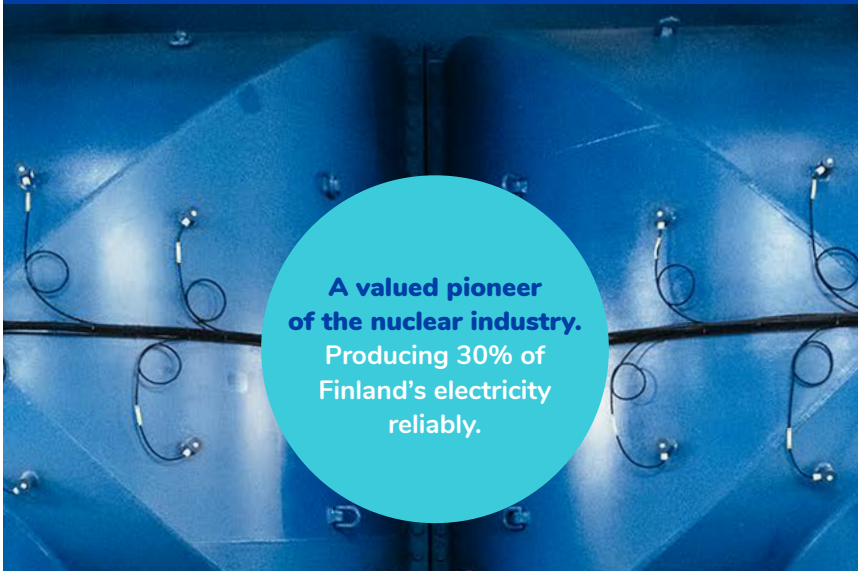
Strategy

MISSION - WHY WE EXIST



We produce climate-friendly nuclear electricity to our shareholders in a safe and competitive manner, thus creating well-being for Finland.

VISION - WHAT WE WANT TO BE



A valued pioneer of the nuclear industry. Producing 30% of Finland's electricity reliably.

VALUES - HOW WE OPERATE



- Responsibly
- Proactively
- Transparently
- Continuously improving

The TVO Group's strategy aims at predictable and competitive electricity production with a strong safety brand. The climate-friendliness of electricity production is a cornerstone of the Company's operations.

The purpose is to ensure that TVO's average electricity production cost remains competitive and that the operability of the plant units meets the

Company's goals. The safety culture is maintained at a high level and safety is systematically upheld and developed further at all stages of the nuclear power lifecycle. At Olkiluoto, electricity is produced by nuclear professionals whose competence and ability to work remain at a high level throughout their career. Everyone works as part of an energetic community by utilising modern ways of working.

As a low-emission form of electricity production, nuclear power has a significant role in achieving climate targets such as those of the Paris Agreement. It is TVO's vision that, as regular electricity production at OL3 begins, approximately 30 percent of Finland's electricity will be produced at Olkiluoto.

TVO's vision also includes being a valued pioneer of the nuclear industry, and the

management of the entire nuclear power lifecycle is an integral part of this aspiration. Posiva, a company jointly owned by TVO and Fortum Power and Heat Oy (Fortum), is the first in the world to have a solution for the final disposal of spent nuclear fuel, and industrial final disposal operations are expected to start in the mid-2020s.



The climate-friendliness of electricity production is a cornerstone of the Company's operations."

Responsibility for the environment and climate

With its Group-level policies, the TVO Group has committed to the principles of sustainable development, and environmental responsibility is an important part of the Company's management system.

TVO and Posiva carry their responsibility for the environment by identifying the environmental and energy efficiency aspects of their operations and by minimising the related adverse impacts. Operational objectives are specified in compliance with the principle of continuous improvement. Environmental research has been conducted on the Olkiluoto island since the 1970s, years before electricity production was launched. The early baseline studies created a basis for the environmental monitoring programmes aimed at facilitating environmental radiation monitoring and determination of the impact on waters. The TVO Group ensures that the personnel and other persons working at the Olkiluoto nuclear facilities have competence and expertise in matters related to the environment.

The TVO Group acknowledges the importance of its overall responsibility for the environment during all the phases of the fuel cycle. The safe use of nuclear fuel is



ensured from raw material procurement to final disposal. The Company monitors and supervises the management of environmental issues implemented by the fuel suppliers. TVO requires that the suppliers assume responsibility for the securing and development of living conditions in the surroundings of uranium production and processing plants, taking indigenous peoples into consideration. Fuel is dealt with

in a responsible manner all the way from uranium mines to final disposal, according to the principle of “from bedrock to bedrock”. The environmental responsibility of final disposal is also on financially stable ground, since nuclear power companies in Finland bear the costs of nuclear waste management, and the funds for that purpose are collected into the Finnish State Nuclear Waste Management Fund.

The aim at the Olkiluoto nuclear power plant is to prevent and further reduce the already low releases of radioactive substances. Abnormal events in the plant process are anticipated and preparedness for the prevention of environmental damage caused by them has been established.

Energy and material efficiency is taken into account in all operations

Energy efficiency requirements are observed and energy efficiency is improved in all operations at Olkiluoto. The efficiency of energy consumption is monitored and continuously improved by taking energy aspects into account in project planning, the procurement of components, and the development of operating practices. Plant unit modernisation projects are implemented to improve the energy efficiency of the power plant process.

TVO participates in the Energy Efficiency Agreement and complies with the associated Action Plan for Energy Production that describes the implementation of actions designed to make the use of energy more efficient and to improve the efficiency of primary energy use as well as the total efficiency of energy production.

TVO and Posiva improve the efficiency of the use of energy and raw materials, and improve the reuse of waste. The goals are to increase the relative share of waste delivered to reuse and to decrease the amount of radioactive waste generated. TVO also strives to reduce the amount of spent fuel by optimising the use and properties of the fuel.

Sustainable utilisation of the environment is taken into account in the development of the Olkiluoto area and the expansion of operations. Surrounded by four nature conservation areas, the small island of Olkiluoto currently produces around one-fifth of all the electricity used in Finland. Once regular electricity production at OL3 starts, the production volume will increase to around one-third. The concentration of energy production in a small geographic area minimises the environmental impact and allows the preservation of other areas in their natural state.

Employees as well as companies and partners working in the power plant area are expected to demonstrate a responsible attitude towards environmental matters in accordance with Group-level policies.



Environmental management

TVO HAS IDENTIFIED THE SIGNIFICANT ENVIRONMENTAL AND ENERGY ASPECTS OF ITS OPERATIONS

Sustainable land use

Emissions in the manufacture and delivery of raw materials, products, and services

Production of climate-friendly electricity

Thermal load on the sea caused by cooling water

Spent nuclear fuel generated during operations

Storage and handling of hazardous or harmful substances

A radioactive release into the environment during a severe accident

The TVO Group's operations are managed with a certified environmental management system that complies with the international standard ISO 14001:2015 and includes an integrated energy efficiency system. TVO's environmental management system is also EMAS registered.

The goals of the management system are increasing the level of environmental protection and its continuous improvement. TVO and Posiva have identified environmental and energy aspects related to their operations and assessed their significance. The significance of environmental and energy aspects is assessed based on statutory and permit requirements as well as by observing the severity/utility, probability, and effects on stakeholder groups of

each impact. Furthermore, opportunities to influence the issue affect the assessment.

Targets for significant environmental and energy aspects have been specified in the Environment and Energy Efficiency Programme and confirmed by the Management Group. A team of environmental experts from various organisational units monitors the progress of the targets regularly. Other subjects discussed at the

team meetings include possible environmental deviations and observations, current regulatory matters, and other environmental matters. The team acts as an expert, advisor, and provider of information in environmental matters.

The feasibility of the environmental management system is assessed every six months in conjunction with the management review. If necessary, corrective

actions are defined to ensure that the targets are reached. The TVO Group identifies all statutory and other requirements pertaining to its operations and systematically monitors the requirements for any changes. Compliance with the requirements is also assessed in conjunction with management reviews. Furthermore, the operations are regularly assessed with audits by the organisation as well as external evaluators.

Targets:

Awareness of the environment and energy efficiency

- » The general guidelines for environmental safety have been prepared as instructions to both TVO employees and cooperation partners on conducting environmentally safe operations in the Olkiluoto area. The inclusion of issues related to the environment and energy efficiency in the model templates prepared for projects and modifications has promoted awareness of these issues.

Zero environmental accidents: There are no serious or significant environmental accidents, there are at least 100 proactive environmental observations.

- » The environmental accident target was reached. There were 114 proactive environmental observations, the majority of which were related to the management of municipal waste, the handling of chemicals and energy efficiency. Observations related to good practices and procedures were also recorded.

Optimal and controlled environmental load from the use of chemicals

- » Inspection and maintenance of pools preventing chemical contamination and oil trap wells in accordance with the preventive maintenance programme. A project to improve the handling of chemicals at the logistics terminal was started.

Proactive environmental safety

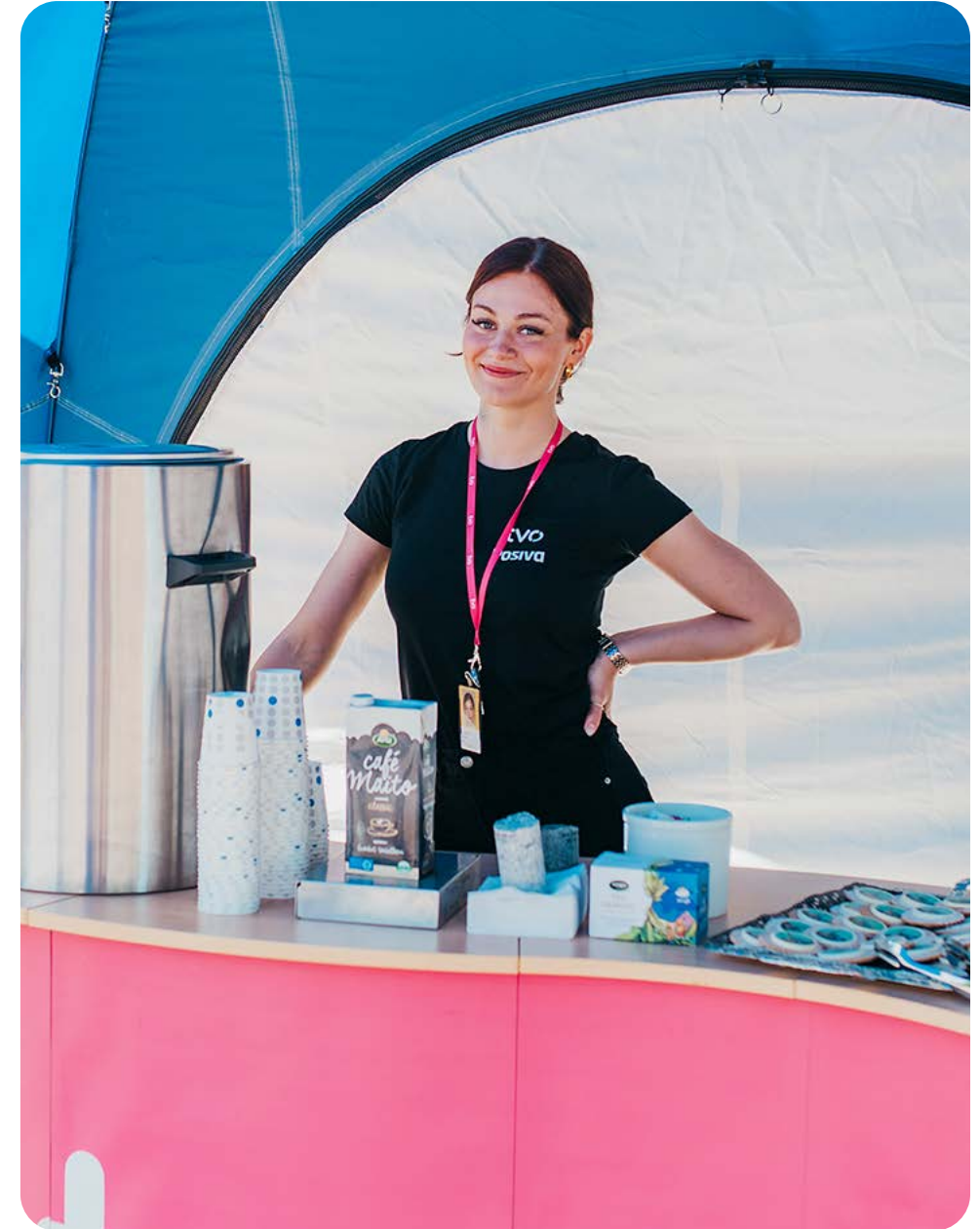
The assessment of environmental risks is part of TVO's comprehensive risk management process. Environmental risks have been identified and assessed, and no risks with significant impact were detected. TVO also utilises a proactive safety observation procedure to prevent environmental damage. A total of 114 observations regarding the environment and energy efficiency were made over the course of the year. TVO's initiative operations also support stakeholder group involvement in TVO's environmental management. All of the safety observations and initiatives are monitored, and all deficiencies are corrected without delay.

In 2022, a total of 30 litres of oil was released into the soil as a result of the breakage of working machines and equipment. All of the oil was successfully recovered. There were also minor refrigerant leaks from the cooling devices. The environmental authorities are informed of all significant environmental deviations and events. A report was provided to the environmental authority regarding malfunctions at the debris handling building for the OL1 and OL2 plant units. Modifications will be implemented at the debris handling building during spring 2023.

Active stakeholder cooperation

Stakeholders play a key role for a company that is engaged in sustainable operations. The Olkiluoto Visitor Centre normally receives some 13,000-15,000 visitors each year. The visitors are openly told about TVO's and Posiva's operations, and their questions are answered. The visitor activities resumed in spring 2022 after a two-year break due to COVID-19.

TVO publishes the "Uutisia Olkiluodosta" (News from Olkiluoto) magazine for people living in the immediate region and engages in diverse communication through digital channels. The aim is to provide understandable, open, and timely communication regarding everything that happens at Olkiluoto. Stakeholders also have the opportunity to submit feedback and questions to TVO via the TVO website. TVO replies to all inquiries that include contact details. In 2022, TVO received two expressions of concern related to environmental issues from external sources. They were related to communication on the ice condition and noise during the commissioning of OL2's new emergency diesel.





Effects of climate change on the business

TCFD (Task Force on Climate-Related Financial Disclosures) is an international reporting recommendation, which offers companies a framework for reporting on the financial risks and opportunities connected with climate change in relation to four thematic areas: governance, strategy, risk management, and metrics and targets. TVO has conducted reporting in accordance with TCFD since 2020.

Climate-friendly electricity production is one of the TVO Group's most significant sustainability aspects, as nuclear power plays a significant role in the mitigation of climate change as a low-emission form of electricity production. CO₂-free electricity production and the increase of production capacity provide TVO with significant business opportunities. The TVO Group's objective is to also assess climate change and environmentally responsible operations from the perspective of possible risks and follow the principle of continuous improvement.

Governance

The governance related to the TVO Group's sustainable development is discussed in the Annual and Sustainability Report in the chapter Responsible leadership.

With its policies, the TVO Group has committed to the principles of sustainable development, and environmental responsibility is an important part of the management system. In its Group-level policies, TVO requires a responsible attitude towards environmental matters not only from its own employees but also from all the companies and partners working in the power plant area.

Strategy

TVO's mission is to create a better quality of life in Finland by producing climate-friendly electricity with nuclear power for its shareholders in a safe and reliable manner. Thus, the mitigation of climate change is an essential part of the TVO Group's strategy. In order to support the strategy planning process, an operating environment analysis is carried out, which recognises the central role of nuclear power in achieving climate goals.

The TVO Group has made a strategic decision to invest in the production of clean electricity. This is reflected in the increase of production capacity of nuclear power with OL3 and in TVO relinquishing its share in the Meri-Pori coal-fired plant in 2020. Today, nuclear

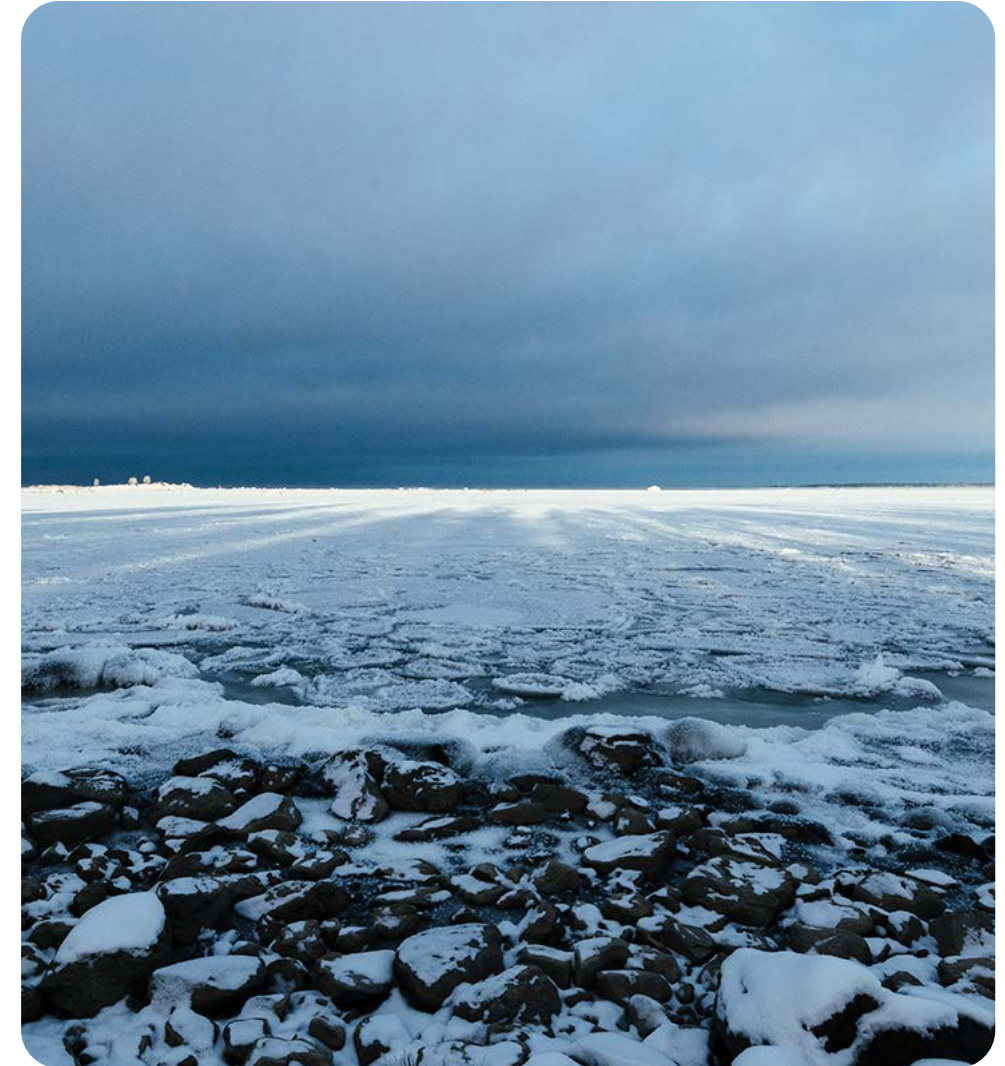


The mitigation of climate change is an essential part of the TVO Group's strategy."

power comprises 100 percent of TVO's electricity production.

Through its strategy, the TVO Group aims to support broader climate targets such as the Paris Agreement. In addition, the TVO Group aims to keep the emissions from its own operations as low as possible and is committed to promoting climate neutrality.

The future strategic opportunities include small modular reactors (SMRs), and TVO has a currently ongoing project in which it is investigating the technical and economic possibilities of using SMRs for climate-friendly electricity and heat production. TVO's R&D activities aim at advancing future technological solutions, which can also function as ways to mitigate climate change.





Risk management

Climate change does not pose significant risks to TVO’s nuclear power plants. The rising temperature of seawater is one impact that could, in the worst case, impact production as a power limitation. Seawater temperature is constantly monitored in order to ensure the effect of the cooling water.

Two Shared Socioeconomical Pathways (SSP) scenarios have been used in order to examine the impact of climate change on TVO’s operations: SSP 2.0–4.5 and 3.0–7.0. The scenarios examine the effects of climate change if the global temperature rises by 2.0–4.5 or 3.0–7.0 degrees Celsius compared with the preindustrial period. Both scenarios will have significant impacts on the Finnish climate. Climate change will introduce changes in all seasons. The geographical area in which TVO operates is not expected to undergo significant changes that would impact the plant units’ safety or production. The plants are designed to withstand sudden external threats, and scenario reviews and change planning enable preparing for upcoming challenges through plant modifications. Furthermore, there are emergency preparedness plans that address sudden external challenges.

Probabilistic Risk Assessments (PRA) are carried out as part of risk management. The PRAs are based on STUK’s nuclear power plant guides (YVL Guides). The PRAs consider the plants’ internal threats as well

as external threats, such as impacts from weather conditions, floods, changes occurring in seawater, and seismic phenomena. STUK oversees the licensee’s risk management and the actualisation of PRAs.

Plant modifications are implemented in order to improve the nuclear plant units’ availability, safety, efficiency, and climate-friendliness. By examining climate scenarios, plant modifications can be carried out in order to prepare for the challenges due to climate change without compromising the Company’s values and strategic goals. Change planning takes into account the results from PRAs and complies with STUK’s YVL Guides.

The TVO Group also collects learnings from other operators in the nuclear sector in order to continuously improve the plants’ safety and availability and to avoid events that have previously occurred elsewhere. For example, the effects of extreme weather and climate phenomena have been taken into account in the plant units’ improvements implemented after the Fukushima nuclear accident.

Metrics and targets

Metrics and targets for climate-friendly electricity production and the climate neutrality of operations are specified in the TVO Group’s Sustainability Roadmap 2030. The progress of achieving climate neutrality is monitored through the TVO Group’s Scope 1 and 2 greenhouse gas

emissions, which have been calculated according to the Greenhouse Gas Protocol (GHG Protocol). In addition, significant metrics concerning the climate and the environment are presented in the Environmental Balance Sheet of this report (p. 14).

Furthermore, the Environment and Energy Efficiency Programme has been prepared to ensure the achievement of the environmental targets specified in Group-level policies and to improve the efficiency of the management of significant aspects related to the environment and energy. The targets and results are presented annually in the Environmental Report.

Greenhouse gas emissions

GHG emissions, t CO ₂ eq	2022
Scope 1	3,076
Scope 2	65,635

READ MORE ABOUT TCFD:
www.fsb-tcf.org

READ MORE ABOUT GREENHOUSE GAS PROTOCOL REPORTING:
www.ghgprotocol.org

Environment and energy efficiency programme



The Environment and Energy Efficiency Programme has been prepared in order to ensure the achievement of the environmental targets specified in Group-level policies and to improve the efficiency of the management of significant aspects related to the environment and energy.

The set targets are based on the production of stable and environmentally friendly electricity for society and on the minimisation of adverse environmental impacts of the operations at all stages of the electricity production chain. Actions, responsibilities, and schedules are set to ensure that the targets are met. To ensure the continuous improvement of operations, the achievement of the targets is regularly monitored.

In 2022, the focus of target setting was on implementing updated environmental guidelines used in projects and modifications, as well as monitoring their compliance. Long-term efforts on the management of radioactive releases and the thermal load of the cooling water were also continued at the power plant. The targets and results of the Environment and Energy Efficiency Programme are presented in this report in the relevant chapters.

In 2022, the operations at the Olkiluoto nuclear power plant and Posiva's final disposal facility worksite complied with legislation, environmental permits, and the environmental management and energy efficiency system, excluding the debris handling for the OL1 and OL2 plant units. The flow measurement for landfill water was also out of use for two months.

UN Sustainable Development Goals:

The TVO Group is committed to the promotion of the following climate-related UN Sustainable Development Goals:



Supply of electricity in Finland and its climate impact

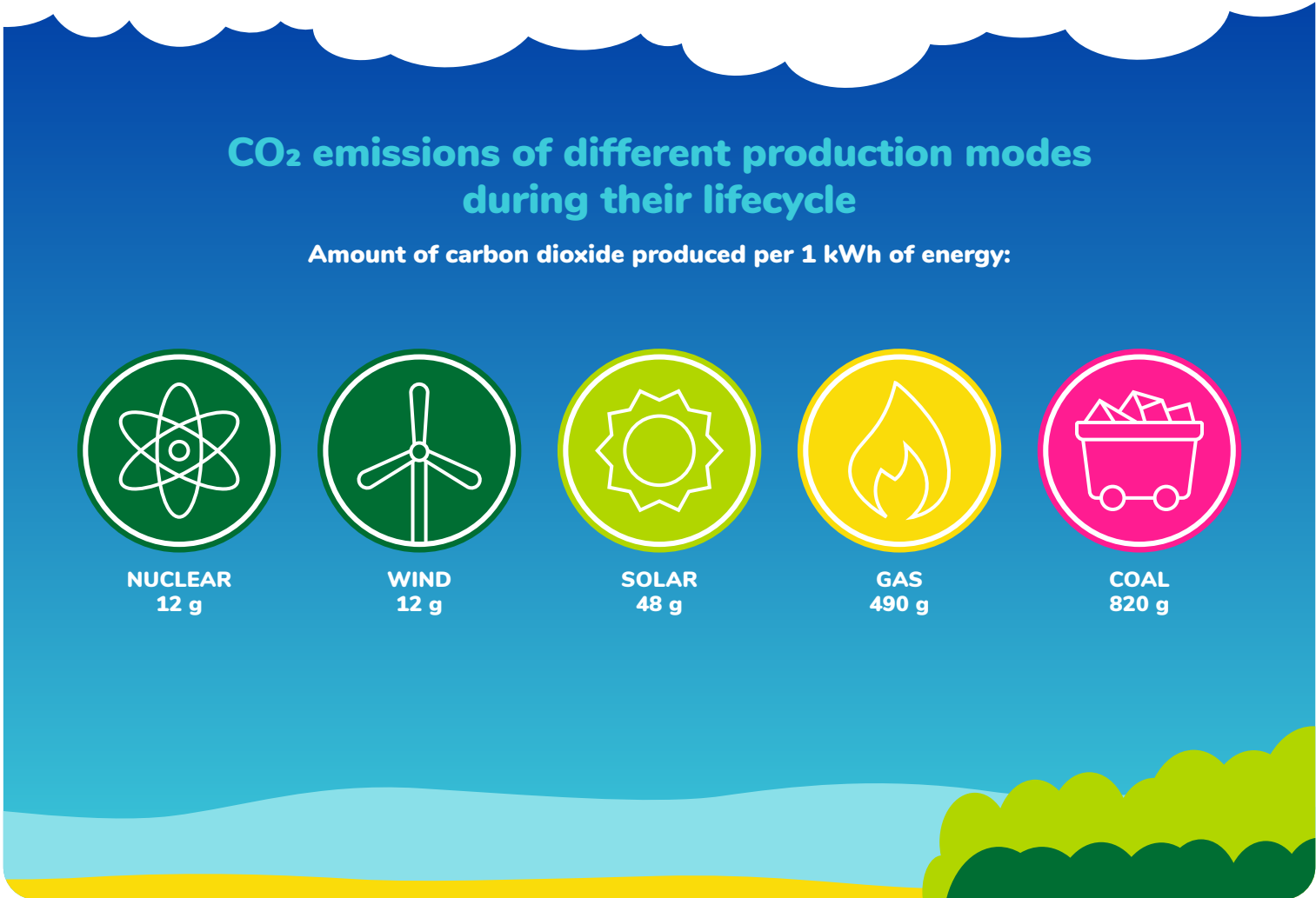
The volume of electricity production at Olkiluoto will be nearly doubled when the OL3 plant unit starts regular electricity production. This means that the low-emission nuclear electricity produced at Olkiluoto will play a significant role in the economic development, electricity self-sufficiency, and general well-being of all of Finland for decades to come.

In 2022, the share of nuclear power was about 35 percent of all the electricity produced in Finland. The combined production from Olkiluoto created about 24 percent of the electricity produced and about one-fifth of the electricity consumed in Finland in 2022.

Electricity in every weather

The electrification of society and phasing out of fossil fuels will require increasingly larger amounts of emission-free electricity even in the future. The role of low-carbon energy, such as renewable energy and nuclear power, is crucial in the mitigation of climate change. One benefit that nuclear power provides is stable production independent of the weather conditions, which supports renewable energy production forms in the electricity system.

In Finland, 72 percent of greenhouse gas emissions are generated in energy production, energy consumption, and traffic. 28 percent of the emissions are generated by the energy industry. Thus, any emission reductions in the energy industry significantly impact the total emissions in Finland.



Source: IPCC

The environmental impacts of nuclear power



The production of nuclear power generates low carbon dioxide emissions – over the entire lifecycle of nuclear power, its total emissions remain on the same level as wind power and hydropower. The long service life of nuclear power plants and their small land use requirements make them even more environmentally friendly.

Nuclear power causes some negative environmental effects as well, such as slight warming of the surrounding sea areas, minor releases into the air, water, and soil during production, and nuclear waste consisting of spent nuclear fuel.

In particular, the final disposal of nuclear waste is a key question in the use of nuclear power. The TVO Group has a unique solution for the final disposal of nuclear waste that is even known all around the world: ONKALO.

Nuclear power for a clean climate

Nuclear power plays an important role in climate change mitigation. With the current nuclear power production in the EU, approximately 580 million tonnes of CO₂ emissions are avoided annually, of which Finland's share accounts for 20 million tonnes.

Over the course of its entire history, the Olkiluoto nuclear power plant has generated 555 TWh of electricity. This production volume has prevented greenhouse gas emissions of approximately 455 million tonnes. This corresponds to all the greenhouse gas emissions in Finland during a period of approximately nine years in a scenario where nuclear power was replaced with condensing coal power, the specific emissions of which amount to 820 g/kWh.

“The long service life of nuclear power plants and their small land use requirements make them even more environmentally friendly.”



Iida Ruishalme:

“The significant threat to our nature is climate change, not nuclear power”



Biologist Iida Ruishalme sees nuclear power as a necessary means for combating climate change. Finland is well on its way towards green energy. Still, more nuclear is needed also in the future.

Biologist Iida Ruishalme became an environmental activist a few years ago when she awoke to the fact that the world would not necessarily stay the same for her children. She blogs actively on agriculture and environmental topics, bringing a scientific viewpoint to the ongoing discussion in society. She is also an active participant in the joint activities of ecomodernists in Europe.

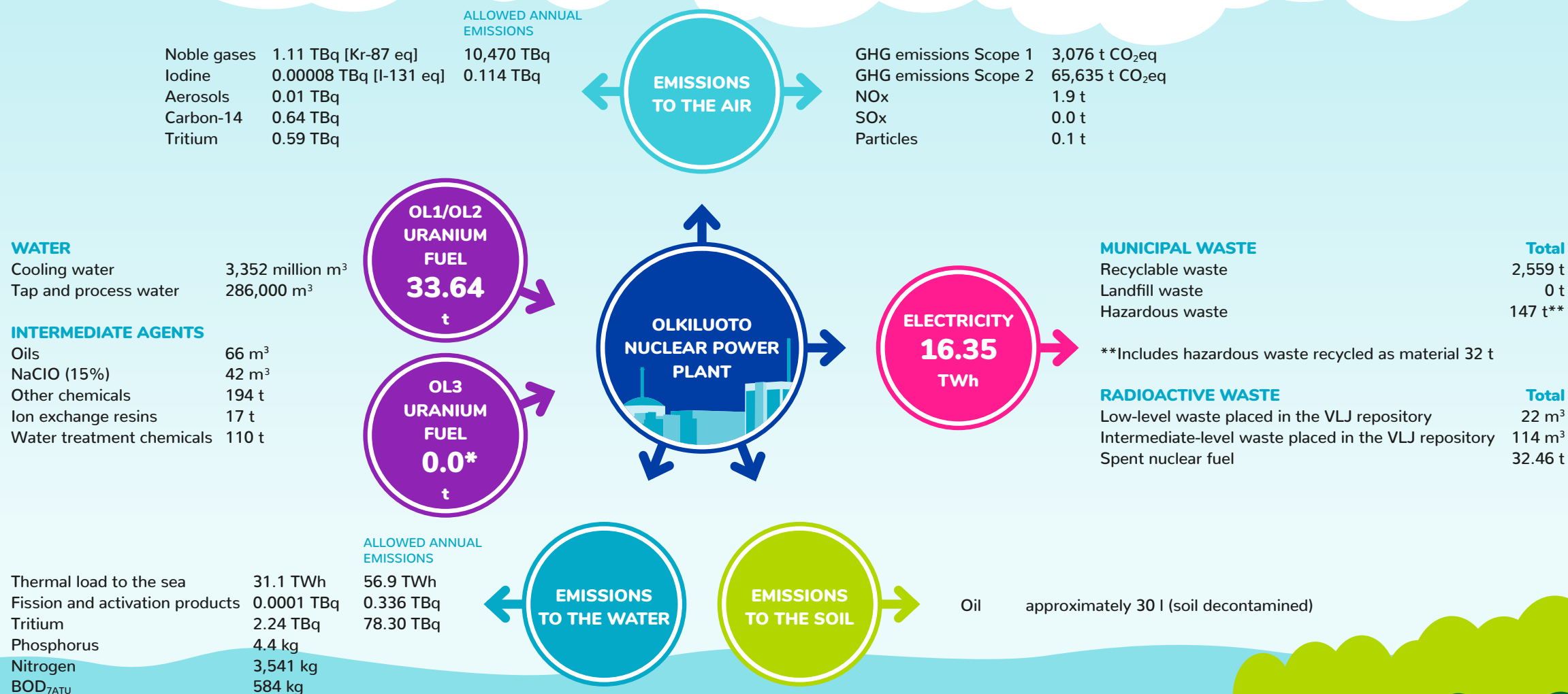
– Ecomodernists emphasise the role of new technologies in nature conservation. We consider new innovations openly and in light of the best available data. You can never know what could help and what could not, if all your thinking is prejudiced, she describes the activities of ecomodernists.

Ecomodernists also look at nuclear with high hopes, and Iida Ruishalme sees it today as a necessary means for the future of Finland and the whole world.

– We need a lot of energy if we wish to have heating, Internet, schools and hospitals also in the future. Energy is needed also for a functional circular economy, such as recycling. Energy is vital for our society, and particularly, energy with low emissions, she points out.

Read the full interview on [TVO's website](#)

Environmental balance sheet



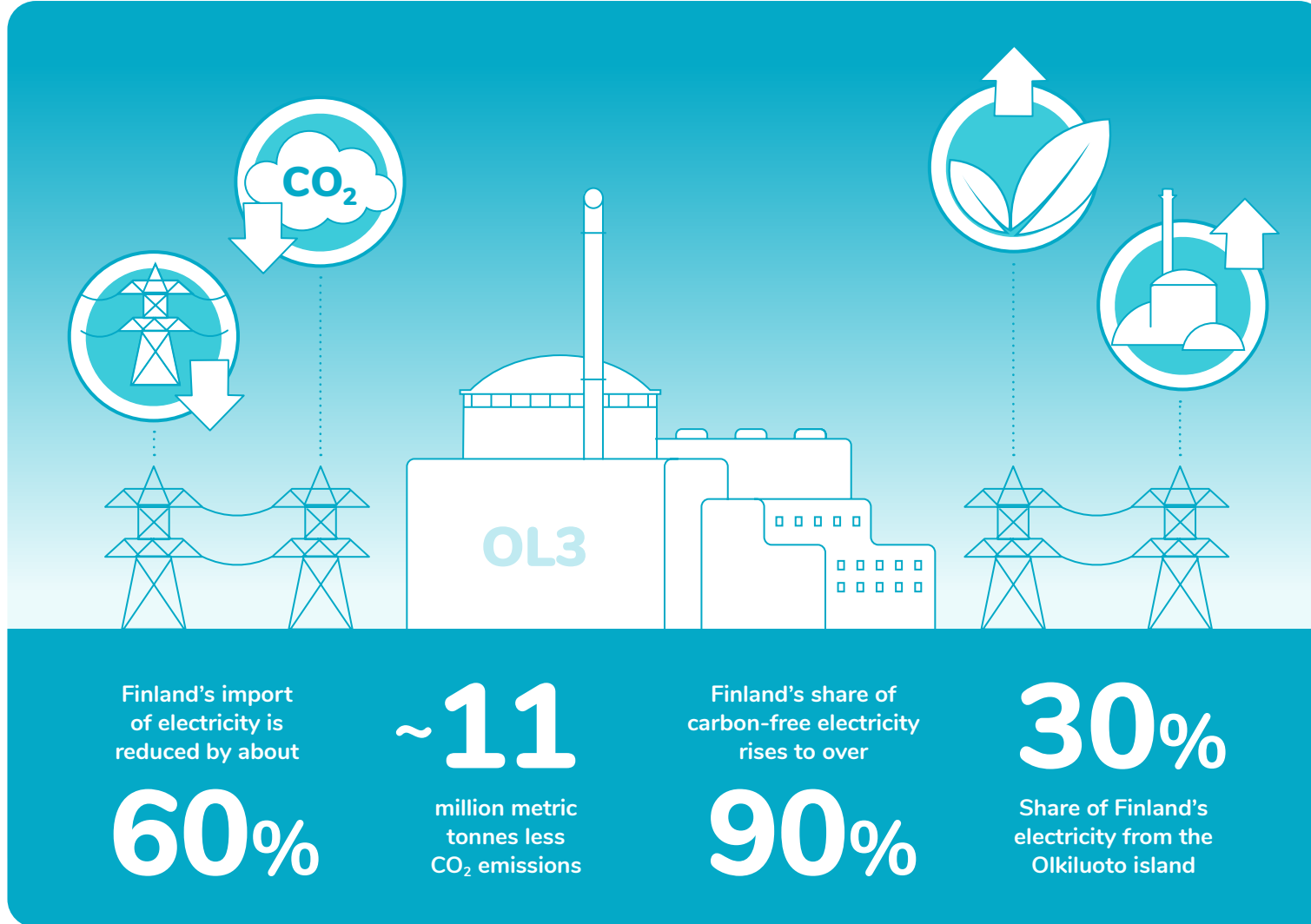
*Fuel was not loaded at OL3 during the year.



Finland's greatest climate act

The single greatest pro-climate act in Finland, the OL3 plant unit, started its electricity production in 2022. Its test production started in March, and the thousands of related tests aim at guaranteeing stable and predictable electricity production far into the future. With this third most powerful nuclear power unit in the world, approximately 30 percent of Finland's electricity will soon come from one island, where the entire lifecycle of nuclear power is managed.

OL3 was first connected to the national grid on 12 March 2022 at 12:01 at a power of approximately 103 megawatts. This started a test production programme spanning several phases in which electrical power was gradually increased with various tests taking place at different power levels. OL3 reached its full 1,600 megawatt power level for the first time on 30 September 2022. The plant unit's test production was interrupted in October, however, as damage in the internal components of feedwater pumps was discovered during repair and service work at the OL3 turbine island. The test production of OL3 continued on 27 December 2022 with the objective of starting regular electricity production in March 2023.



By replacing electricity generated with coal, OL3's production will reduce annual CO₂ emissions by approximately 11 million metric tonnes. This amount corresponds to the annual greenhouse gas emissions from traffic in Finland. Simultaneously, Finland's self-sufficiency in clean electricity grows – the share of carbon-free electricity production will rise from 87 percent to over 90 percent. OL3's electricity production will reduce the import of electricity by approximately 60 percent.

The commissioning of OL3 is reflected in some of the environmental indicators for 2022.



OL3 was first connected to the national grid on 12 March 2022 at 12:01."

Learn more about the atmosphere in the main control room at the time of connecting OL3 to the national grid on our website



Targets:

The thermal load of cooling water does not exceed 56.9 TWh annually

» The cooling water temperature remained below the target values specified in the environmental permit. The thermal load to the sea was 31.1 TWh.

Cooling water

The warming of the seawater due to the thermal load from the cooling water is the most significant negative environmental impact of the Olkiluoto nuclear power plant. The total volume of seawater used for the cooling is approximately 76 m³/sec at the OL1 and OL2 plant units and approximately 57 m³/sec at the OL3 plant unit.

In 2022, 3,352 million cubic metres of seawater were used for cooling, and the resulting thermal load on the sea was 31.1 TWh. Seawater temperature is monitored as required by the environmental permit. One of the permit conditions is that the seawater temperature must not exceed the target value of 30°C when measured as a weekly rolling average at a distance of 500 metres from the cooling water discharge channel. Limit values have also been specified for the amount of cooling water (max. 4,415 million m³) and the thermal load (max. 56.9 TWh) in the environmental permit. None of the permit limits were exceeded in 2022.

As the cooling water passes through a plant unit, its temperature increases by approximately 10°C, after which it mixes with seawater. The cooling water does

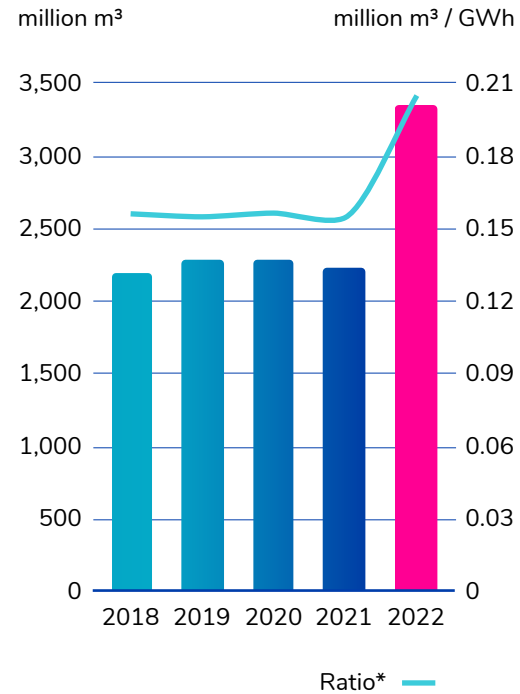
not come into direct contact with the power plant's process water. Throughout the operation of the power plant, TVO has monitored the impact from cooling water and conducted related surveys. The cooling water accumulates in an extensive sea area in the surface layer, from where part of the heat transfers into the air. Depending on the weather conditions, an increase in temperature can be observed at an approximate distance of 3–5 kilometres from the cooling water discharge location.

The cooling water also causes changes in the ice conditions, as the cooling water discharge area remains unfrozen throughout the winter. The size of the unfrozen and weak ice area varies depending on the winter weather. Warnings about the unfrozen area are issued to the local residents in newspapers and with ice warning signs. The warm cooling water extends the growth period in the unfrozen sea area and increases its overall biological production. Other biological effects caused by the cooling water are minor.

The solid material is extracted from the cooling water at the debris handling building. During 2022, malfunctions

Water usage

Cooling water

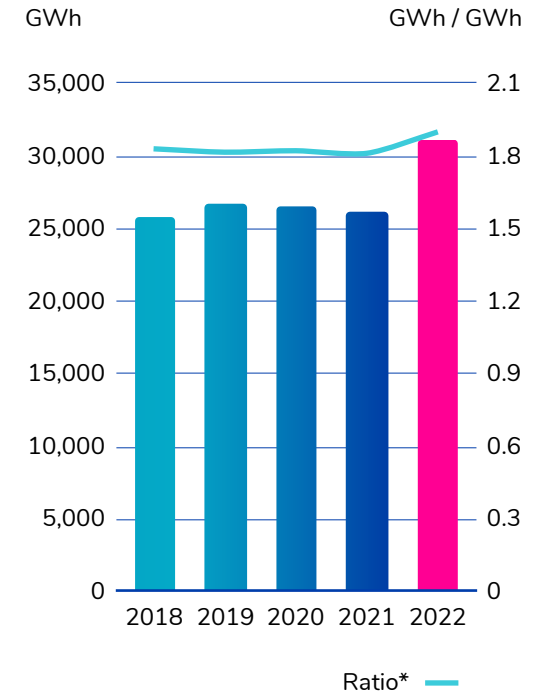


*The ratio is given per GWh of electricity produced.

occurred at the debris handling building for the OL1 and OL2 plant units.

Emissions

Thermal load on the sea



*The ratio is given per GWh of electricity produced.

Modifications will be implemented at the debris handling building in spring 2023.



Targets:

Suppliers' environmental responsibility

- » Supplier's performance of environmental and energy efficient aspects was not improved as planned.

Development of supplier monitoring in Olkiluoto

- » The activities of the cooperation and safety forum for contractors operating in Olkiluoto were continued. Environmental plans were prepared for projects and the control of work areas was carried out based on the plans.

Raw materials and material efficiency

TVO ensures the safe use of the uranium used as nuclear fuel at all stages of the electricity production chain from responsible procurement to safe final disposal. TVO's OL1 and OL2 plant units require an annual total of approximately 35 tonnes of low-enriched uranium for fuel. In the future, OL3 will need approximately 32 tonnes of fuel annually.

TVO uses a diversified nuclear fuel procurement chain, meaning that separate contracts are concluded for the different procurement stages, usually with several suppliers for each stage. Procurement operations are based on long-term contracts with leading suppliers. Uranium is only acquired from suppliers who meet the strict requirements specified by TVO.

Material efficiency through recycling

The TVO Group procures products that are durable and have a long lifespan and takes into account opportunities for their recycling and potential reuse at the end of their service life. The procurement operations ensure safe, competitive, and reliable production and the long-term operation of the plant units.

The purchased products and services must meet the TVO Group's requirements concerning quality, occupational safety, and the environment. The availability of products and services necessary for the Group's operations is ensured by means of long-term agreements that are based on mutual trust and partnership.

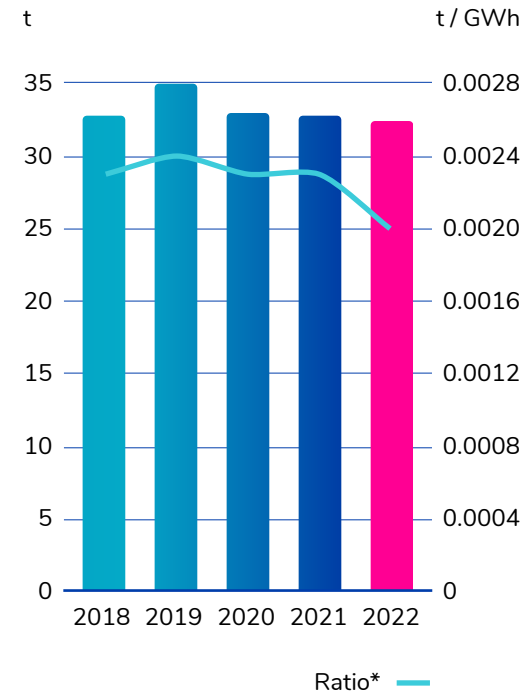
Intermediate agents in production

Chemicals are extensively stored and processed by TVO. The Olkiluoto nuclear power plant is a safety report establishment. The intermediate agents include the fuel (oil) for the emergency diesel generators, the reserve power boiler plant, and vehicles as well as the sodium hypochlorite (NaClO) used for hydroid control in the seawater systems. The ion-exchange resin used to clean the process water as well as solvents used at the plant including bitumen, nitrogen, hydrazine, and ammonia water are among the intermediate agents to be reported.

Reducing water consumption

In addition to the seawater used as cooling water, the Olkiluoto power plant makes use of fresh water, which is used as tap water and process water. The

Material efficiency Nuclear fuel spent



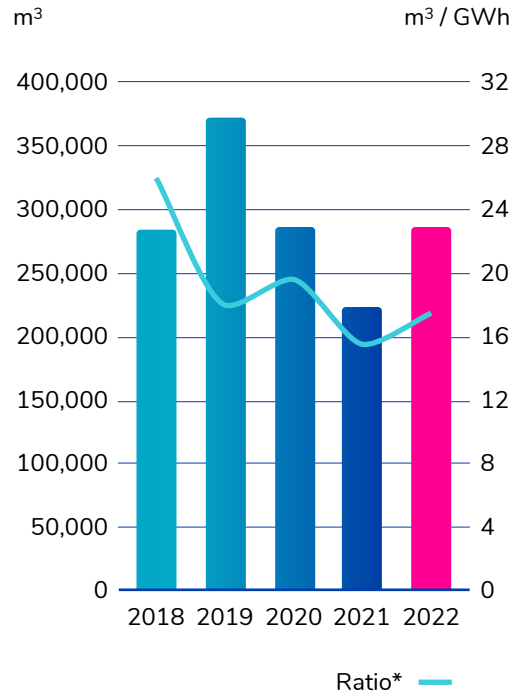
*The ratio is given per GWh of electricity produced.



process water that boils in the reactor must not contain any salts, impurities, or particles that could damage the reactor internals. Olkiluoto has all the necessary plants for water treatment: a water treatment plant, a demineralisation plant, a laboratory, and a wastewater treatment plant. The tap water and process water are treated at the water treatment plant. Ion exchange and reverse osmosis methods are used to purify all the water used at Olkiluoto. Process water is continuously recirculated and purified.

During annual outages, the fuel pool water is stored in storage pools and later reused. The recirculation of water reduces TVO's need for clean process water and the amount of process wastewater discharged from the plant by approximately 30,000 m³ each year. During the reporting year, 286,000 m³ of fresh water was taken from the Eurajoki river for use at the power plant.

Water usage
Untreated water



*The ratio is given per GWh of electricity produced.

Intermediate agents	2022	2021	2020	2019	2018
Oils (m ³)	659	1,046	748	732	657
NaClO (15%) (m ³)	42	42	48	39	45
Other chemicals (t)	194*	148	223	118	137
Ion exchange resins (t)	17	13	15	15	15
Water treatment chemicals (t)	110	112	83	104	153

*For OL3, includes only other chemicals procured by TVO.





Production and energy efficiency

Targets:

Production of climate-friendly electricity: Production goal for 2022: 24,874 GWh and with the completion of OL3, 1/3 of electricity in Finland. The TVO Group's operations are climate neutral by 2030.

» The OL1, OL2, and OL3 plant units produced electricity amounting to 16,351 GWh, which means the production goal was not reached. The start of commercial electricity production at OL3 was postponed until spring of 2023.

Total energy saving target for the agreement period 2017–2025: 150 GWh

- » The energy saving target was achieved already in 2019. TVO continues to be committed to improving energy efficiency, through carrying out a minimum of four location reviews annually and plant measurements after the annual outages in Olkiluoto. The target was achieved.
- » The project of the areal heating network at OL3 was started and the heating network will be extended in the Olkiluoto area by 20 GWh by the year 2024.

In 2022, the combined electricity production of the Olkiluoto plant units, OL1, OL2, and OL3, was 16,351 GWh. The combined load factor of OL1 and OL2 was 93.0 percent. TVO produced approximately 20 percent of all the electricity consumed in Finland.

The plant units operated safely. The net production for OL1 was 6,932 GWh and the load factor was 89.1 percent. The net production for OL2 was 7,532 GWh and the load factor was 96.8 percent. A record production result was reached at OL2. The net production for OL3 was 1,887 GWh and the load factor was 16.9 percent during test production.

OL3 was connected to the national grid for the first time in March 2022. Regular electricity production will start in March 2023.

Improving energy efficiency

For several years, the TVO Group has participated in the voluntary Finnish Energy Efficiency Agreement for Industries. TVO signed the agreement for the first time in 1998. In accordance with the agreement, efforts have been focused on the continuous improvement of energy efficiency at the plant units and in the Olkiluoto area.

TVO has also signed the Energy Efficiency Agreement for 2017–2025. During this period, the associated Action Plan for Energy Production aims to implement actions designed to make the use of energy more efficient, as well as to improve the efficiency of primary energy use and the total efficiency of energy production. TVO's energy savings target for the 2017–2025 agreement period is a total of 150 GWh, which corresponds to the average annual consumption of about 7,500 single-family homes with electric heating. This target was already achieved in 2019, so an additional savings target of 500 MWh was set for 2022–2023.

The TVO Group has an Energy Efficiency Group, whose tasks include the examination, monitoring, and development of energy savings measures. Furthermore, the Energy Efficiency Group is responsible for ensuring that the energy savings targets are met.

Energy efficiency measures carried out in 2022 included the renovation of the ventilation in the OL2 entrance building and the energy efficiency improvements in the maintenance building. As a result of the energy efficiency measures, the expected saving in energy consumption will be

OL1	2022	2021	2020	2019	2018
Net production (GWh)	6,932	7,404	7,310	7,542	6,755
Capacity factor (%)	89.1	95.1	93.7	96.9	87.8
Efficiency (net) (%)	35.6	35.6	35.5	35.5	35.3

OL2	2022	2021	2020	2019	2018
Net production (GWh)	7,532	7,033	7,277	7,209	7,334
Capacity factor (%)	96.8	90.4	93.3	92.7	94.3
Efficiency (net) (%)	35.4	35.5	35.4	35.5	35.4

OL3	2022	2021	2020	2019	2018
Net production (GWh)	1,887	-	-	-	-
Capacity factor (%)	16.9	-	-	-	-
Efficiency (net) (%)	28.3	-	-	-	-

approximately 518 MWh in the future. During the year, energy reviews were also performed at the accommodation village, main gate, generator storage, and the Posiva project office, for example. A minimum of four location reviews are performed each year, and they are used as

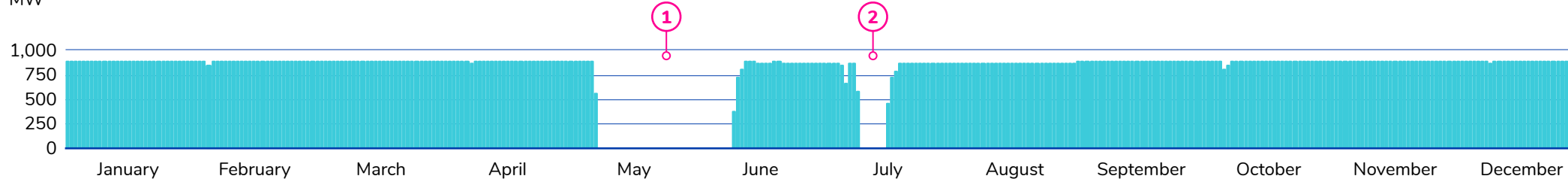
the basis for selecting the modifications to be performed. Plant measurements were performed at OL1 and OL2 after the annual outages. The expansion of the district heating network to OL3 was started at the end of the year.



OL1 Production

Average output

MW

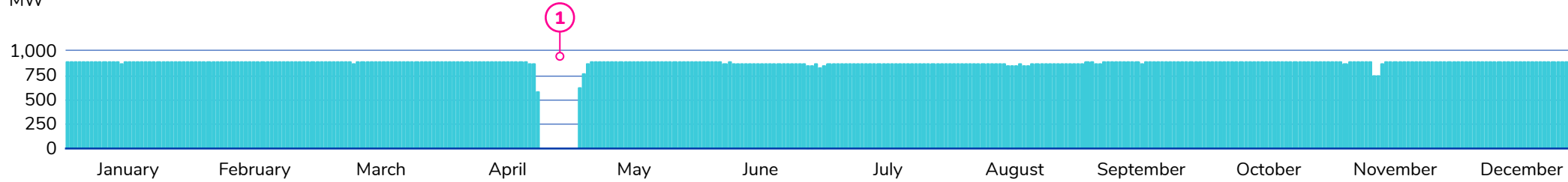


- 1. Annual outage
- 2. Cold shutdown to remove damaged fuel

OL2 Production

Average output

MW

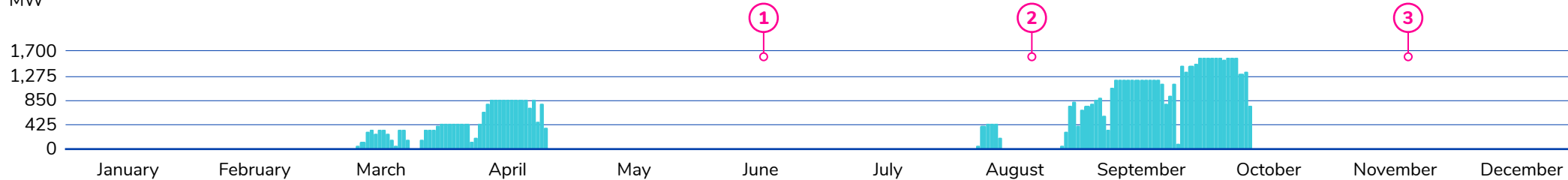


- 1. Annual outage

OL3 Production

Average output

MW



- 1. Generator and turbine island repair works
- 2. Automation updates at the turbine island
- 3. Turbine island maintenance outage



TVO and Posiva carry out activities related to energy efficiency as part of their normal operations. For TVO, the highest potential for savings involves the improvement of the efficiency of the electricity production process; this has been implemented in the long term by means of modernisation projects at the plant units throughout their operational history. Another area for improvement is the reduction of in-house energy consumption at the site in Olkiluoto. The TVO Group's environmental management system incorporates the energy efficiency system ETJ+ that is used to continuously improve energy efficiency across all functions.

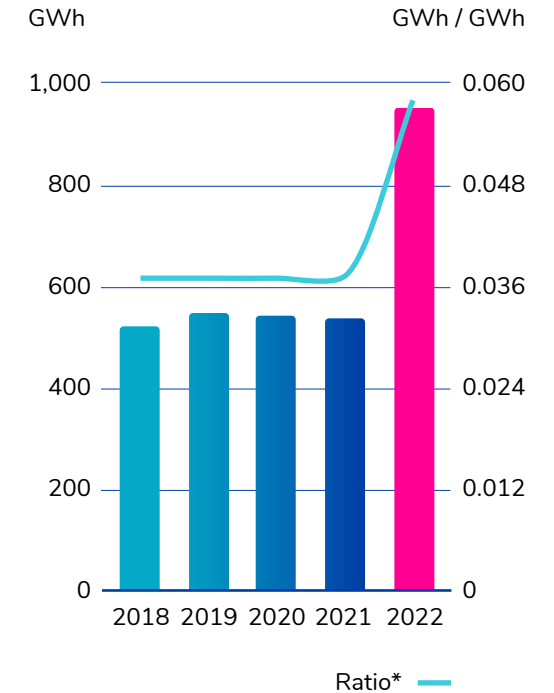
District heating is currently obtained from the OL1 and OL2 plant units. It is lost heat coming from the plant units. Approximately 20 GWh of heat was directed to the external network to be used for heating buildings. In the coming years, the OL3 plant unit will also be included in the district heating network.

The electricity used in Olkiluoto consists of electricity produced in-house and electricity purchased from the power market. The plant units use electricity generated in their own production. Currently, electricity is purchased from the power market for the Olkiluoto outdoor areas, Posiva, and the plant units when they are not in production operation. The distribution of production methods in the electricity purchased from the power market is calculated according to the residual



distribution from the Energy Authority. In 2021, the percentages were as follows: nuclear power 48.58, fossil-based energy sources and peat 44.47, and renewable energy sources 9.95.

Energy efficiency TVO's electricity consumption



*The ratio is given per GWh of electricity produced.

20 GWh

district heating from the plant units to buildings in Olkiluoto.



Targets:

Keeping radioactive emissions into the air clearly below the limits set by the authorities

» Radioactive emissions into the air remained clearly below the limits set by the authorities. The targets of TVO's own ALARA programme were not reached for air emissions.

Reducing air emissions of emergency diesel generators and reserve boilers

» A fuel that contains a biocomponent has been approved for use. This reduces Scope 1 emissions according to the GHG protocol.

Releases into the air

With regard to the management of releases of radioactive substances, TVO always strives to keep any releases well below the limits set by the authorities as well as TVO's own target limits, which are more stringent than the official limits. TVO takes part in Finland's fight against climate change by producing low-emission base load electricity.

Radioactive releases into the air

Noble gas emissions into the air amounted to 0.01 percent and iodine emissions into the air amounted to 0.07 percent of the allowed limit value specified by the authorities.

The theoretical radiation dose caused to neighbouring residents in Olkiluoto is estimated to remain clearly below the threshold value. In 2021, the radiation dose was 0.16 µSv (threshold value: 100 µSv).

Greenhouse gases and other releases into the air

The Olkiluoto nuclear power plant is included in the European Union's emissions trading scheme that aims at monitoring greenhouse gas emissions and achieving CO₂ reduction goals. Posiva

Radioactive emissions to the air	2022	2021	2020	2019	2018
Noble gas TBq (Kr-87 equivalent)	1.11	0.20	0.97	1.76	0.91
% of allowed amount	0.01	0.002	0.01	0.02	0.01
Iodine TBq (I-131)	0.00008	0.00013	0.00012	0.0008	0.0005
% of allowed amount	0.07	0.13	0.12	0.74	0.48
Aerosols TBq	0.01	0.00005	0.0002	0.00006	0.0006
Tritium TBq	0.59	0.40	0.34	0.82	1.32
Carbon-14 TBq	0.64	0.54	0.65	0.64	0.93

Emissions to the air (t)	2022	2021	2020	2019	2018
GHG emissions Scope 1 (CO ₂ eq)	3,076	3,897	3,254	-	-
CO ₂ emissions included in emissions trading scheme	1,439	2,436	1,751	1,388	1,505
GHG emissions Scope 2 (CO ₂ eq)	65,635	68,743	29,677	-	-
NO _x	1.9	3.2	2.2	2.2	1.8
SO _x	0.0	0.0	0.0	0.0	0.0
Particles	0.1	0.2	0.1	0.2	0.1

also plays an important role in the mitigation of climate change since the final disposal solution is a part of the lifecycle of nuclear power.

The power plant's verified CO₂ emissions are generated by the releases of the reserve boilers and the emergency diesel generators. The purpose of the emergency diesel generators is to automatically ensure the power supply of the plant in a possible but unlikely loss-of-power

situation. In order to ensure safety, the emergency diesel generators are regularly tested in compliance with the Technical Specifications, which means that their emissions cannot be lowered.

The replacement of the emergency diesel generators at OL1 and OL2 will reduce particulate emissions to the atmosphere. This largest modernisation project in the history of Olkiluoto reached a milestone in summer 2020, when the ninth emergency

diesel generator was deployed. This unit is independent of OL1 and OL2, and it will enable the replacement of the eight original generators one by one. Three emergency diesel generators had been replaced by the end of 2022.

Going forward, the emergency diesel generators and reserve boilers will switch to using a fuel that contains a biocomponent, which makes them more climate friendly. This transition is included in the goals of the Environment and Energy Efficiency Programme for 2022–2024.

The TVO Group has continued the calculation of greenhouse gas emissions in accordance with the GHG Protocol. Scope 1 emissions include direct emissions from the Company's operations, and they take into account the emissions from the emergency diesel generators, reserve boilers, vehicles, machinery and equipment, as well as refrigerant leaks. Scope 2 accounts for indirect emissions generated by the Company's energy consumption. The majority of Scope 2 emissions are from electricity purchased for OL3.

In 2022, calculations were started for the TVO Group's Scope 3 emissions. Scope 3 emissions include indirect emissions connected with the Company's operations from sources which are not owned by the Company itself. The calculations for Scope 3 emissions will be continued in 2023 with the aim of reporting the results as part of the annual reporting in 2023.



Targets:

Development of water supply

» The objective of the construction project of a parallel raw water line is to secure the supply of raw water and the reliable operation of water management at the Olkiluoto nuclear facilities. From the year 2023 onward, sanitary water from Olkiluoto will be led to Rauma for treatment. The project proceeded as planned in 2022. The larger wastewater treatment unit makes more effective purification of wastewater possible and reduces the impact of wastewater on water bodies.

Keeping radioactive emissions into the water clearly below the limits set by the authorities

» Radioactive emissions into the water remained clearly below the limits set by the authorities. The targets of TVO's own ALARA programme were reached for water emissions.

Releases into water and soil

The releases of radioactive fission and activation products into water amounted to 0.04 percent and tritium emissions to 2.9 percent of the allowed annual limit value specified by the authorities.

Low levels of tritium were observed in water and air samples taken from the operating waste repository (VLJ repository) in May 2022. The tritium amounts detected in the repository were low and estimated to be comparable to the amount of background radiation in nature.

Sanitary wastewater is treated at the Olkiluoto wastewater treatment plant before it is discharged into the sea. In 2022, the amount of treated sanitary wastewater was 79,387 m³. The phosphorus load discharged into the seawater was 4.4 kg, the nitrogen load was 3,541 kg and the biological oxygen demand (BOD_{7ATU}) was 584 kg. The treatment of sanitary wastewater is based on the permit regulations specified for the purification efficiency and loads discharged into water bodies, as well as regulatory requirements. Emissions from the sanitary wastewater treatment plant were a fraction of the nutrient load of the Eurajoki river running to the north of Olkiluoto. Water quality measurements are taken by a third party.

In the June and December samplings, the wastewater treatment plant's processing requirements were not met in terms of the residual concentration of organic matter and the purification performance. The environmental permit regulation issued on a yearly level was met.

TVO has an ongoing project where, going forward, wastewater from Olkiluoto will be routed for processing to the Maanpää wastewater treatment plant in Rauma via a transfer sewer system that runs from Eurajoki to Rauma. The processing of wastewater in a larger unit allows for its more efficient purification and reduces the load caused on the water systems. The total value of the project is approximately EUR 5.9 million. The goal for the 2022–2024 period of the Environment and Energy Efficiency Programme is for the project to be completed in summer 2023.

Releases into the soil

Over the course of the year, a total of approximately 30 litres of oil ended up in the soil due to failures of machinery and equipment. All of the oil was recovered.

Radioactive emissions to water	2022	2021	2020	2019	2018
Fission and activation products TBq	0.0001	0.0002	0.0004	0.0001	0.0001
% of allowed amount	0.04	0.06	0.15	0.04	0.04
Tritium TBq	2.24	1.68	1.55	1.59	1.62
% of allowed amount	2.9	9.2	8.5	8.7	8.9

Wastewater treatment	2022	2021	2020	2019	2018
Amount of water (m ³)	79,387	89,957	90,304	83,545	89,558
Concentration (mg/l)¹⁾					
BOD _{7ATU}	7.4	3.3	4	6.6	10
Phosphorus	0.05	0.05	0.07	0.37	0.12
Treatment efficiency average (%)¹⁾					
BOD _{7ATU}	97	99	98	97	96
Phosphorus	100	100	99	96	99
Load on the sea area (kg)					
Phosphorus	4.4	4.4	6.2	31	11
Nitrogen	3,541	4,380	4,745	2,993	4,380
BOD _{7ATU}	584	296	365	548	913
Water treatment chemicals (t)	23	26	29	32	35

¹⁾ The permit regulation for the sanitary wastewater: The maximum BOD_{7ATU} value of wastewater discharged into the seas is 13 mg O₂/l and the maximum phosphorus concentration is 0.52 mg P/l. The minimum treating efficiency for the BOD_{7ATU} value and phosphorus is 95%. All values are calculated as annual averages.



Targets:

Reducing low- and intermediate-level waste and clearance from regulatory control

» The planning to construct a disposal repository for very low-level waste (VLLW) at Olkiluoto was continued and the temporary storage for VLLW was completed during the summer in the power plant area. Procedures were continued for the development of sorting of operating waste.

Development of circular economy: Minimising municipal solid waste and reuse of waste as material (minimum 55% of total amount of waste, excluding waste sludges)

» Waste reused as material accounted for ca. 57% of the total amount of waste. Also, dishes, furnitures and computer displays removed from use, for example, were given way to employees and donated to charity. The volume of crushed surplus concrete used in earth works amounted to 9,420 t.

Waste

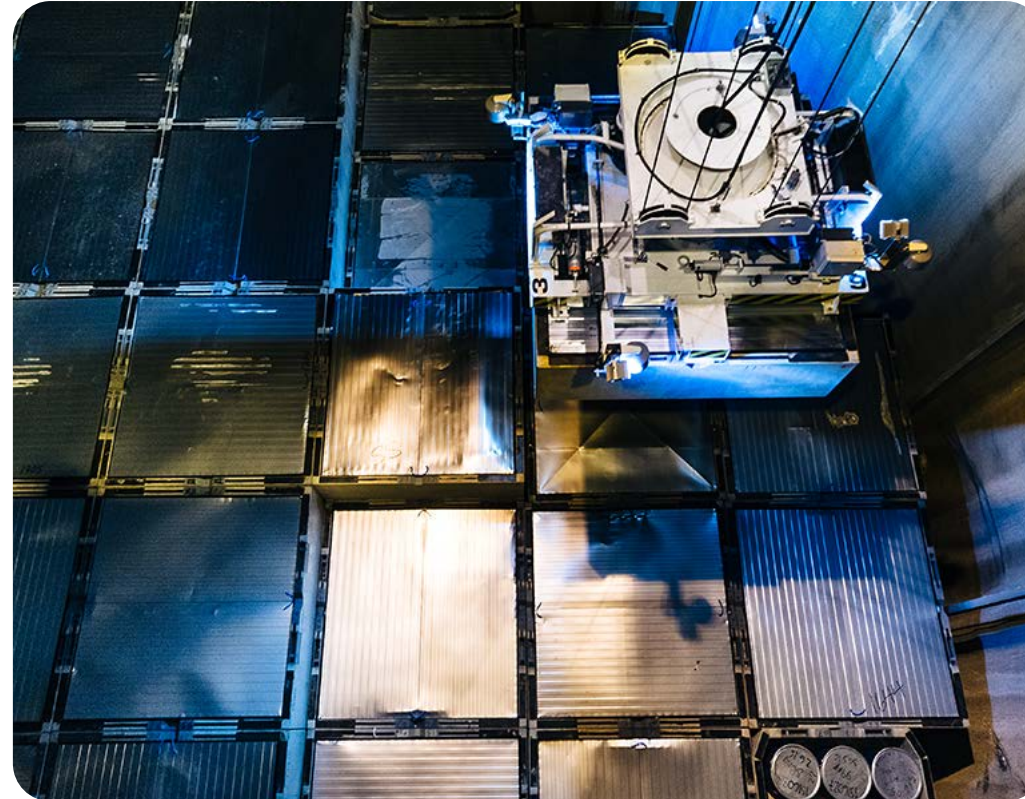
The TVO Group is committed to reducing the amount of waste and promoting its utilisation. Radioactive waste is isolated from the organic environment until its radioactivity has decreased to a harmless level. The TVO Group disposes of the radioactive waste it generates in a responsible manner.

Radioactive waste

The waste produced at the power plant is classified, based on its radioactivity, into waste exempted from control, low- and intermediate-level operating waste, high-level spent fuel, and decommissioning waste.

Waste exempted from control contains such a small amount of radioactive substances that the waste can be reused or delivered to the Olkiluoto landfill for final disposal. This waste is produced during the operation and maintenance of the power plant. In 2022, no maintenance waste was exempted from control. Approximately 40 tonnes of metal and mixed scrap were exempted from control.

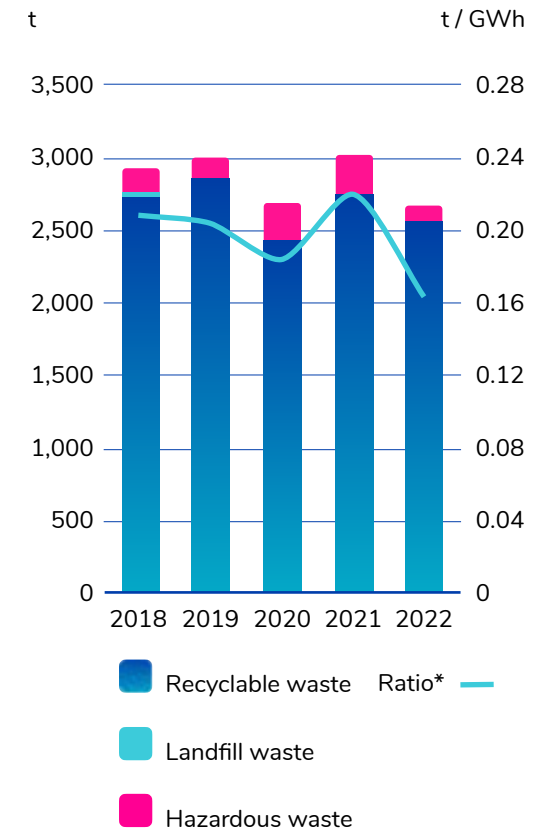
Protective equipment used in operating and maintaining the power plant,



components removed from the process, and insulating materials are low-level waste. Such waste is tightly packaged and placed in the operating waste repository (VLJ repository) located at an approximate depth of 100 metres in the

plant area. TVO is planning to construct a disposal repository for very low-level waste (VLLW) at Olkiluoto. It will reduce the amount of low-level waste placed in the VLJ repository.

Waste Municipal waste



*The ratio is given per GWh of electricity produced.



The ion exchange resins used for the treatment of the process water at the power plant are classified as intermediate-level waste, which is incorporated in bitumen and placed in the VLJ repository. In 2022, intermediate-level waste amounting to 114 m³ and low-level waste amounting to 22 m³ was placed in the VLJ repository.

TVO uses an operating waste management manual that contains the procedures and instructions for the handling, storage, and final disposal of radioactive waste. The employees working with operating waste management receive training on the subject on the basis of separate training requirements and induction programmes.

The total amount of high-level radioactive waste generated during the reporting year was 32.46 t. Once the spent fuel is removed from the reactor, it is cooled in the fuel pool inside the

reactor hall for a few years, after which it is transferred to the spent fuel interim storage located in the plant area (KPA storage). In the KPA storage, the fuel is stored under water, which provides shielding against radiation as well as cooling. The fuel is kept in an interim storage at Olkiluoto until it can be placed in final disposal in the Olkiluoto bedrock. The final disposal will start in the mid-2020s. Posiva is the first company in the world to commission a safe final disposal solution for spent nuclear fuel.

In order to construct the final disposal repositories, approximately 500,000 solid cubic metres of Olkiluoto bedrock have been excavated by 2022. The majority of blasted stone has been utilised for construction on the Olkiluoto island and in the local area. The objective in all the preparations for final disposal, such as method research and the construction of facilities, is to minimise the impacts on the surrounding nature.

Decommissioning waste is waste produced in connection with the disassembly of the power plants at the end of the operating life. The final disposal of decommissioning waste will also take place at Olkiluoto.

Municipal waste

The operation of the power plant also generates municipal waste and hazardous waste. The TVO Group is committed to

the reduction of the amount of waste and to the improvement of the reuse of waste. This is a requirement for everybody working at Olkiluoto. The goal is to route any usable products for reuse, and donations to charity are also made. The generation of waste is considered already at the procurement stage, with the aim to reduce the volume of waste generated. The TVO Group focuses on procuring products that are durable and have a long lifespan and takes into account opportunities for their recycling and potential reuse at the end of their service life.

All waste generated at Olkiluoto is sorted and processed. The sorted waste is recycled as materials whenever possible, or reused as energy. Only waste that cannot be reused in any manner is taken to the landfill. In 2022, no such waste was generated. The optimal use of chemicals is one of the ways aiming at reducing the amount of hazardous waste. All hazardous waste is collected in the hazardous waste storage to be sent to an appropriate waste treatment plant.

In 2022, the total volume of waste was 2,674 tonnes. Waste suitable for recycling as materials or reuse as energy amounted to 96 percent of the total amount of waste, and the share of hazardous waste was 4 percent. Most of the hazardous waste was batteries and WEEE (waste electrical and electronic equipment) as well as oil-water mixtures and glycol.

Radioactive waste	2022	2021	2020	2019	2018
Low-level (m ³) ¹⁾	22	0	92	150	92
Intermediate-level (m ³) ¹⁾	114	0	18	7	53
Operating waste cleared after monitoring (t)	0	0	0	0	44

¹⁾ Operating waste placed in the VLJ repository during the year.

Amount of spent fuel in the OL1 and OL2 storage polls and interim storage, cumulative	2022	2021	2020	2019	2018
Number of assemblies (pcs)	9,914	9,724	9,524	9,328	9,122
Assemblies (t)	1,660.7	1,629.6	1,597.5	1,564.9	1,531.2

Municipal and hazardous waste OL1, OL2, and OL3 (t)	2022	2021	2020	2019	2018
Mixed waste to energy	135	209	176	126	232
Landfill waste to TVO's landfill	0	0	0	0	44
Paper and cardboard	69	73	111	69	75
Energy waste	193	203	205	194	230
Biowaste	110	98	86	66	100
Wood	153	180	220	407	276
Metal	194	172	119	955	251
Glass	3	4	5	4	5
Plastic	3	3	4	2	-
Cable refuse	4	9	20	11	45
Crushed brick and concrete	23	210	8	5	439
Screening	8	11	38	25	36
Hazardous waste	147 ¹⁾	298 ¹⁾	243	151	165
Sludge ²⁾	1,632	1,627	1,425	990	1,038

¹⁾ Includes hazardous waste recycled as material 32 t.

²⁾ Sludge from the wastewater treatment plant, sand water & shellfish water mixture (solid matter 8-10%).

96%

The share of waste reused as materials and energy of the total amount of waste.



Targets:

Sustainable land use and biodiversity

- » The concentration of energy production in a small geographic area minimises the environmental impact and allows the preservation of other areas in their natural state.
- » A steering group for infrastructure and land use adapts infrastructure designed and implemented in the area to the natural environment, paying particular attention to natural sites and nature conservation areas.
- » During the year, places that increase biodiversity were mapped. A new natural meadow will be established in Olkiluoto in spring 2023.

Environmental research and biodiversity

The island of Olkiluoto is one of the most researched areas in Finland, and its diverse nature is charted in detail. Environmental research has been conducted on the island since the 1970s, years before electricity production was launched. The early baseline studies created a basis for the environmental monitoring programmes aimed at facilitating environmental radiation monitoring and determination of the impact on waters.

Environmental radiation safety at the Olkiluoto nuclear power plant is continuously monitored with many different methods and through the cooperation of several parties. Around 300 samples are taken from the environment of Olkiluoto each year to be analysed in compliance with an environmental radiation monitoring programme approved by STUK. There are also several radioactivity monitors in the immediate vicinity of the plant. They continuously measure radiation and are connected to STUK's automatic network for monitoring external radiation.

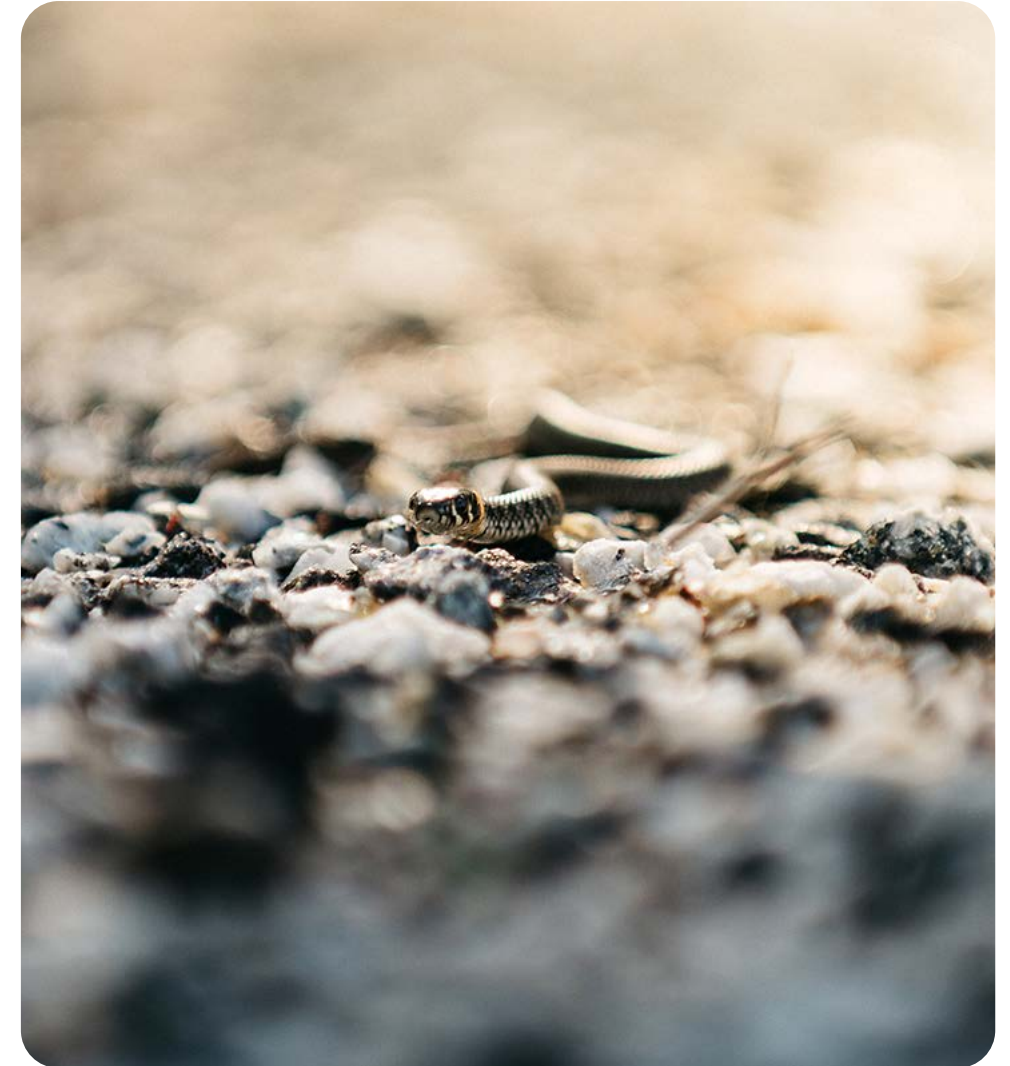
Over 100 water samples are taken each year from the sea area surrounding Olkiluoto. These samples are subjected to approximately 1,500 different water quality

analyses. Furthermore, the condition of fish stocks in the sea area is monitored by, for instance, fishing for record-keeping purposes and surveys among professional and recreational fishermen. Test fishing takes place every four years in the areas surrounding Olkiluoto in accordance with the environmental monitoring plan. The state of aquatic flora is monitored by means of transect line diving every six years.

All the Olkiluoto plant projects have undergone extensive environmental impact assessments (EIA). The final disposal of spent nuclear fuel has been studied since the 1980s, and it has also been evaluated through environmental impact assessments. The most recent EIA concerns the construction of a near-surface final disposal repository for very low-level waste at Olkiluoto.

Centralising production secures biodiversity

Climate change also has a major impact on biodiversity. As a producer of climate-friendly electricity, TVO safeguards and maintains the diversity of nature. About 24 percent of all electricity produced in Finland and about 20 percent of all electricity consumed in Finland is





generated on the small island of Olkiluoto, surrounded by four nature conservation areas. The concentration of energy production in a small geographic area minimises the environmental impact and allows the preservation of other areas in their natural state.

The total surface area of the Olkiluoto island is 900 hectares, of which areas constructed for nuclear power and final disposal amount to approximately 170 hectares. The total quantity of non-water-permeable areas is 43 hectares. TVO does not own any nature conservation-oriented areas.

Promoting biodiversity

A biodiversity study is completed on the island of Olkiluoto every ten years. The next comprehensive study will take place in 2023. A nature investigation was carried out in the island's western part in 2020. The biotopes occurring at Olkiluoto are mostly barren with few species, but the four nature conservation areas surrounding the power plant area add to biodiversity. In places, the bird population on the island of Olkiluoto and in its surrounding areas is diverse and plentiful, and the constructed areas offer nesting opportunities for some notable bird species. In 2022, waterside vegetation surveys and test fishing were carried out in the sea area. Energy production and the construction of the spent nuclear fuel disposal facility have had no significant impact on

the nature of Olkiluoto, which is barren and poor in species for the most part.

Biodiversity is promoted as part of the Environment and Energy Efficiency Programme, which includes, for instance, the principle of aligning the needs of the natural environment and any infrastructure being planned and to be placed in the area during land use planning, with special emphasis on locations relevant in terms of nature and nature conservation areas. The TVO Group's Sustainability Roadmap also includes goals concerning biodiversity, in relation to efficient land use and projects promoting biodiversity. A new natural meadow will be established in Olkiluoto in spring 2023.

TVO and Posiva aim to improve biodiversity in connection with their operations and cooperate with stakeholders within different projects. The impacts of the power plant's cooling water are mitigated with an annual fishery fee of EUR 11,000.

Biodiversity is also considered when planning decommissioning. The Centre for Economic Development, Transport and the Environment and the municipality of Eurajoki monitor the environmental permits, according to which detailed landscaping plans are required for the decommissioning of the power plant or a specific area. The plan for the landscaping takes into account restoring the area to its natural state and other goals regarding biodiversity, and they are approved by the authorities.



Targets:

Management of nuclear safety risks

» Risks are actively identified and measured for their probability and consequences by means of up-to-date Probabilistic Risk Assessment (PRA). The identified risks are mitigated applying the Safety As High As Reasonably Achievable (SAHARA) principle.

Cooperation with authorities

The operation of a nuclear power plant is subject to licences and permits, and it is governed by the authorities. The authority supervising nuclear and radiation safety in Finland is the Radiation and Nuclear Safety Authority, STUK.

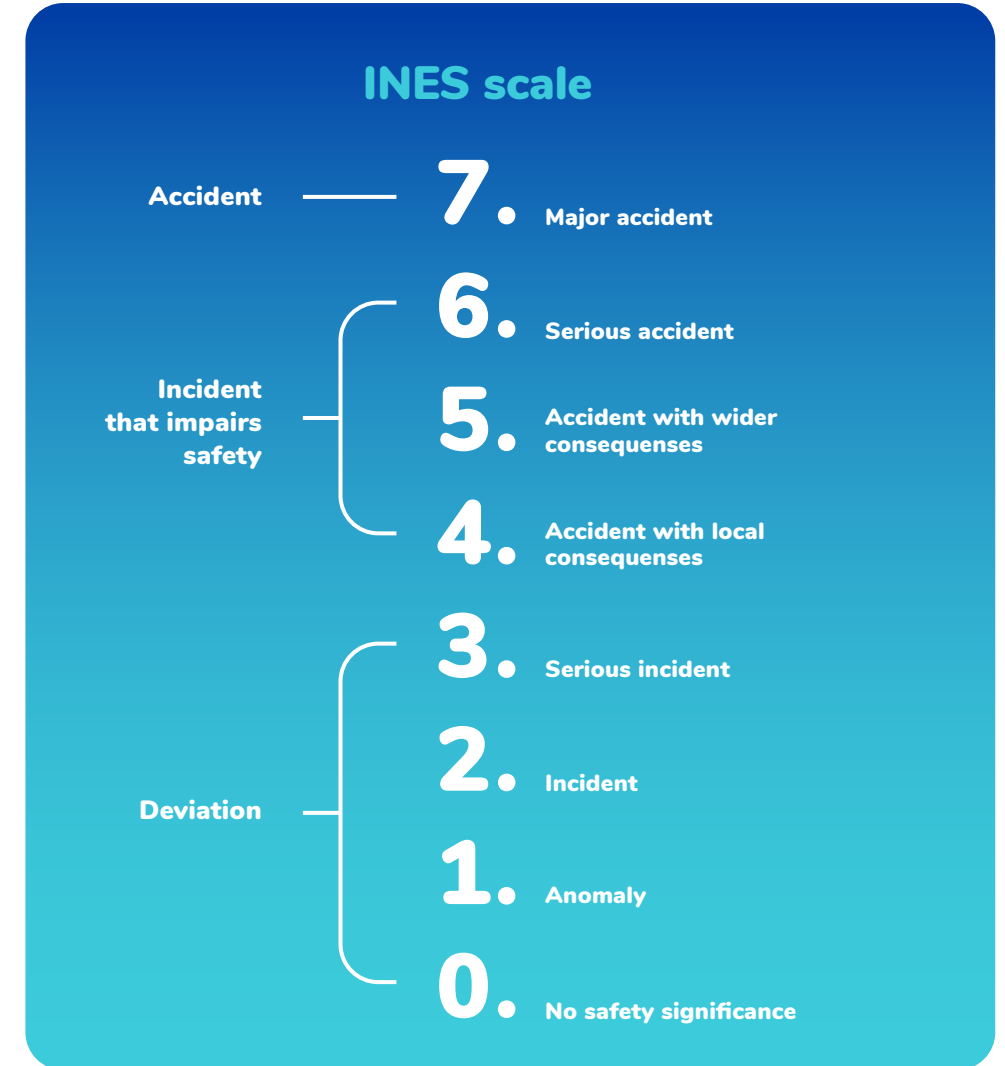
The competent environmental permit authority is the Southern Finland Regional State Administrative Agency, and the supervising authority is the Southwest Finland Centre for Economic Development, Transport and the Environment. Other authorities involved in the management of environmental matters include the environmental department of the municipality of Eurajoki and the Ministry of Economic Affairs and Employment, which acts as TVO's liaison authority in EIA procedures.

Radiation monitoring samples taken from the Olkiluoto environment are submitted to STUK for analysis. TVO annually prepares a report on the waste and emissions caused by its operations and submits the report to several regional and national authorities. TVO annually reports its environmental investments and environmental protection activity expenses to Statistics Finland. After verification, the annual carbon dioxide emissions of

the emergency diesel generators and reserve boilers are reported to the Energy Authority. Energy saving measures are reported to Motiva. The Finnish Safety and Chemicals Agency (Tukes) acts as the supervising authority for the industrial processing and storage of hazardous chemicals.

Events affecting nuclear safety

The Olkiluoto nuclear power plant units operated safely throughout the year. TVO classifies events affecting nuclear safety in accordance with the international INES scale (0–7). In 2022, 17 events rated as INES level 0 (no nuclear or radiation safety significance) and two events rated as INES level 1 (anomaly, exceptional incident with safety effects) took place at the Olkiluoto plant. TVO analyses and investigates all events that may have affected nuclear safety and defines the corrective actions for their causes. TVO publishes news on any significant events that may be of public interest on its website. TVO also follows events at other nuclear facilities around the world. The activities of the Olkiluoto nuclear power plant are constantly developed on the basis of any event observations made.





Permits govern the activities

In addition to legislation pertaining to nuclear energy and radiation safety, operations are also regulated by requirements laid down in environmental legislation. Operating the Olkiluoto nuclear power plant is subject to a permit according to the Environmental Protection Act, and cooling water intake is subject to a permit according to the Water Act. The permits are valid until further notice.

Environmental and water permit decisions cover power plant operations and its emergency power generation systems. The permit conditions control the nuclear power plant's cooling water volume and the amount of heat contained in it, wastewater treatment efficiency, the processing of waste, operations in the event of operational occurrences and emergencies, as well as monitoring and reporting. In addition, there are separate environmental permits for the supporting operations of the Olkiluoto nuclear power plant, such as the landfill area and the quarry material storage area. The municipality's environmental authority carried out periodical inspections of these areas in October 2022, which concluded that the activities were in compliance with the environmental permits.

Licences according to the Chemicals Act have been granted for the handling and storage of hazardous chemicals. The reserve boilers of the Olkiluoto nuclear power plant, as well as the emergency diesel generators of the OL1, OL2, and OL3 plant units (a total

of 16 generators), are included within the scope of the emissions trading system. In compliance with the Finnish Emissions Trading Act, TVO submits an annual verified emissions report and a verifier's statement to the emissions trading authority.

TVO is planning to construct a disposal repository for very low-level waste (VLLW) at Olkiluoto. In addition, the Olkiluoto water management project for securing the supply of raw water and building a transfer sewer for wastewater has progressed according to plan, and its commissioning will take place during 2023. The expansion of the district heat network to OL3 was started in late 2022.

Compliance with environmental legislation

The TVO Group continuously monitors statutory regulations and other requirements pertaining to its operations. People in charge of different areas are responsible for ensuring that the organisations receive sufficient up-to-date information about statutory requirements and their impact on the TVO Group's operations. Compliance with the requirements is regularly assessed in internal and external audits as well as in management reviews. In 2022, the TVO Group's operations complied with environmental legislation, licences, and permits, excluding the debris handling for the OL1 and OL2 plant units. The flow measurement for landfill water was also out of use for two months.



Final disposal of spent nuclear fuel

Targets:

Responsible nuclear waste management

- » The final disposal facility's operating licence application was submitted to the Finnish Government in December 2021, and its processing has advanced according to plan.
- » Posiva has the best knowledge and expertise in the final disposal of spent nuclear fuel, and it is the most desired international reference and valued partner.

The types of nuclear waste generated at a nuclear power plant include waste exempted from control, low- and intermediate-level operating waste, and high-level spent nuclear fuel. Posiva is responsible for the final disposal of spent nuclear fuel generated at the power plants of its owners: TVO (Olkiluoto NPP) and Fortum (Loviisa NPP).

Compared to the amount of produced energy, the volume of waste and its space requirements are low. The principle of nuclear waste management is to isolate the waste from organic nature until the radioactivity of the waste has decreased to an insignificant level.

The responsibility for nuclear waste management lies with the nuclear power companies. They must carry out the necessary nuclear waste management measures for their own waste and cover their costs. According to the Finnish Nuclear Energy Act, the nuclear waste generated in Finland must be treated, stored, and placed in final disposal in Finland, and the import of other countries' nuclear waste into Finland is prohibited.



Responsibly from bedrock to bedrock

Spent nuclear fuel from the nuclear power plants of TVO and Fortum will be packed in copper canisters and placed in final disposal in the Olkiluoto bedrock at a depth of approximately 430 metres. Posiva manages the research into the final disposal of its owner companies' spent nuclear fuel, the construction and operation of a disposal facility, and the eventual closure of the facility.

In 2019, Posiva started the EKA project, which aims at initiating final disposal operations in the mid-2020s. The project involves constructing an above-ground encapsulation plant and installing the systems necessary for starting final disposal in the underground ONKALO facility, obtaining the requisite operating licence for the final disposal concept, the facility complex and its systems, and preparing the supply chains needed for production before starting the actual final disposal of spent nuclear fuel. The EKA project has a

strong impact on vitality – the cost estimate of the large-scale construction project is approximately EUR 500 million, and its employment impact is approximately 2,500 person work-years. At its highest, the project will employ approximately 500 people.

The final disposal facility's operating licence application was submitted to the Finnish Government in December 2021, and its processing has advanced according to plan. The most significant events in 2022 included the completion of the encapsulation plant's construction work ready for installations, as well as the completion of the excavations of the first five deposition tunnels in June at a depth of 430 metres. The underground installations of civil and building technology also progressed well and on schedule.

The manufacture of the encapsulation plant's central systems is under way. In 2022, installations included the handling cell's drying station and the canister's welding station. A disposal hole drilling rig has been taken into use at the final disposal repository. Due to delivery delays of some systems, the trial run of final disposal (practicing final disposal with non-radiating fuel element copies) planned for the end of 2023 was postponed by six months.

Finland is the only country to proceed to the implementation of final disposal, which makes the EKA project unique on a worldwide scale. Therefore, Posiva also plays an important role in the mitigation of climate change as part of the lifecycle of nuclear power. Several countries employing nuclear energy have disposal facilities for low- and intermediate-level waste, but the final disposal of high-level spent nuclear fuel has not been started anywhere else in the world.

Posiva's subsidiary Posiva Solutions Oy (PSOY) sells this expertise, which has been generated through 40 years of multidisciplinary research. PSOY provides tailored expert services for final disposal and ready-made solution and service models for nuclear waste management companies together with a broad network.

Long-term safety is based on the multi-barrier principle

Final disposal is based on employing multiple release barriers. Release barriers ensure that the nuclear waste cannot be released into organic nature or become accessible to humans. A deficiency of a single barrier or a predictable geological or other change will not jeopardise the performance of the isolation. The release barriers include the physical state of the fuel, the final disposal canister, the bentonite buffer, the backfilling of the tunnels, and the surrounding rock.



The long-term safety of the solution is paramount in the final disposal of spent nuclear fuel. It is evaluated and demonstrated with the safety case. According to the international definition, a safety case refers to all of the technoscientific documentation, analyses, observations, examinations, tests, and other evidence for justifying the reliability of the assessments made on the long-term safety of final disposal. Plenty of time has been reserved for the preparation and practical execution of final disposal, and safety is evaluated at many stages. The final disposal of spent nuclear fuel will continue for approximately one hundred years.

According to legislation, a party with a nuclear waste management obligation must present to the Ministry of Economic Affairs and Employment at regular intervals a plan on how they intend to carry out the measures pertaining to nuclear waste management and their preparation.

Posiva's owners submitted the annual report for nuclear waste management in 2021 to the Ministry of Economic Affairs and Employment at the end of March 2022. The nuclear waste management scheme for 2022–2026 was submitted to the Ministry in June 2022, which contains an estimate of the nuclear waste management costs for the purposes of financial provision.

**FOR MORE INFORMATION ON POSIVA,
PLEASE VISIT:
www.posiva.fi**



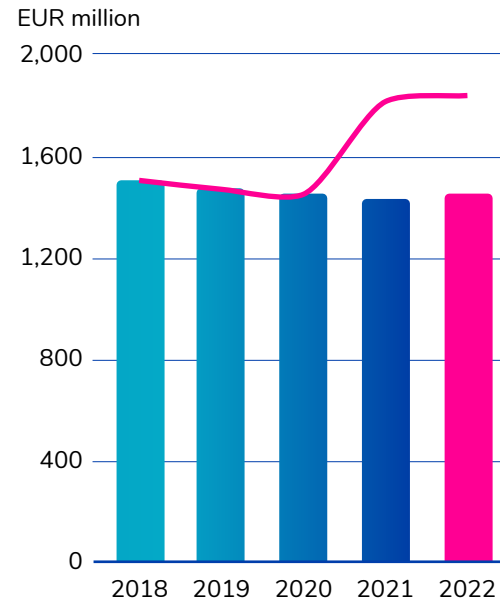
Advance collection of waste management funds

The costs of nuclear waste management and final disposal of spent fuel are collected in the price of nuclear electricity from shareholders and placed in a fund for future use.

In Finland, nuclear power companies bear the costs of nuclear waste management, and the funds for that purpose are collected into the Finnish State Nuclear Waste Management Fund. Each year, the Ministry of Economic Affairs and Employment determines the share of each nuclear power company in the Fund as well as the waste management fee to be paid to the Fund. The liability share of the nuclear power companies in the Fund is decreased by the investments they make in final disposal.

The annual fee payable to the Fund is determined on the basis of the difference between the amount of accumulated nuclear waste for final disposal and the measures implemented for nuclear waste management. The fee is also increased or decreased on the basis of how well the Fund succeeds in its investments: if the investment profit is higher than expected, the waste management fee is correspondingly reduced. The objective is to collect enough assets in the Fund for the final disposal of accumulated nuclear waste.

TVO's fund target in the Finnish State Nuclear Waste Management Fund confirmed by the Ministry of Economic Affairs and Employment



— Liability confirmed by the Ministry of Economic Affairs and Employment



In Finland, nuclear power companies bear the costs of nuclear waste management.”



Development Director Tiina Jalonen:

”The operating licence application encapsulates 40 years’ worth of research”



Posiva’s work aiming at the final disposal of nuclear fuel is progressing on schedule. One big milestone was reached at the end of 2021, when the company submitted an operating licence application to the Ministry of Economic Affairs and Employment. It is a crystallisation of the research work carried out over 40 years to ensure safe final disposal. Posiva has previously been granted two decisions-in-principle and a construction licence.

The submitted operating licence application cannot be considered light evening reading. It contains a total of 364 pages of hard facts and a huge amount of summarising to even get there. There have been quite a number of projects, studies, and reports over more than four decades.

– The application itself refers to documentation, which in turn refers to background reports. If all of these were added together, the number of pages would be in the dozens of thousands, says Posiva’s Development Director Tiina Jalonen.

According to Jalonen, the fact that Olkiluoto is the first in the world to launch final disposal is not only due to the excellence of the people at Posiva.

– We in Finland have had the ability to think about the overall benefit to society, Jalonen says. The willingness to implement a final disposal solution has also been strong, and it has been found on all sides.

Read the full interview on [Posiva’s website](#)



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EMAS statement

TVO's Environmental Report is based on the requirements laid down in the EMAS Regulation and serves as a verified environmental statement of the operation of the Company.

The environmental report for 2022 provides a comprehensive presentation of the environmental impact of TVO's operation, the Company's objectives with respect to environmental protection, and their achievement, as well as the key environmental indicators.

DNV Business Assurance Finland Oy Ab (FI-V-0002) has in the capacity of an accredited, independent and objective party verified the information presented in the Environmental Report on the 10th of February 2023.

TVO publishes the Environmental Report in Finnish and English.

The information to be reported for 2023 will be published in the spring of 2024.



**Todennettu
ympäristöasioiden
hallinta**
REG.NO. FI - 000039

The Olkiluoto power plant has been EMAS (Eco-Management and Audit Scheme) registered with the code FI-000039 (NACE code 35)

Requirement	Report page
A clear and unambiguous description of the organization registering under EMAS and a summary of its activities, products, and services, and its relationship to any parent organizations as appropriate.	Review by the President and CEO TVO in brief
The environmental policy and a brief description of the environmental management system of the organization.	Group-level policies Environmental management
A description of all the significant direct and indirect environmental aspects which result in significant environmental impacts of the organization and an explanation of the nature of the impacts as related to these aspects.	Responsibility for the environment and climate The environmental impacts of nuclear power Environmental balance sheet Environmental management
A description of the environmental objectives and targets in relation to the significant environmental aspects and impacts.	Environmental management
A summary of the data available on the performance of the organization against its environmental objectives and targets with respect to its significant environmental impacts. Reporting shall be on the core indicators and on other relevant existing environmental performance indicators.	Environmental management Supply of electricity in Finland and its climate impact The environmental impacts of nuclear power Cooling water Raw materials and material efficiency Production and energy efficiency Releases into the air Releases into water and soil Waste Environmental research and biodiversity Final disposal of spent nuclear fuel
Other factors regarding environmental performance including performance against legal provisions with respect to their significant environmental impacts.	Environmental management Cooperation with authorities Cooling water Releases into the air Releases into water and soil Waste Final disposal of spent nuclear fuel
A reference to the applicable legal requirements related to the environment.	Cooperation with authorities
The name and accreditation number of the environmental verifier and the date of validation.	Confirmation of compliance



Confirmation of compliance

DNV Business Assurance Finland Oy Ab has, as an accredited certifier (FI-V-0002), reviewed the environmental management system at Teollisuuden Voima Oyj's Olkiluoto power plant. Based on this review, DNV Business Assurance Finland Oy Ab states that the environmental system with the programs and audit procedures as well the updated environmental statement including the indicators fulfil the requirements of Regulation (EC) No. 1221/2009 as well as Commission regulation (EC) 2017/1505.

Scope and methodology of verification

The updated Environmental Statement 2022 (called Environmental Report 2022) was verified at the Olkiluoto location of Teollisuuden Voima Oyj remotely the 6th of February 2023. The audit of the environmental management system according to ISO 14001:2015 that was continued on-site at Olkiluoto at the 6th-9th of February 2023 is acknowledged to be a part of the verification process.

The scope of the report and the accuracy of the information contained therein were verified by means of a written report and practical inspections. Key personnel at the

plant were interviewed, and the information contained in the report was compared with information found in reviewed source material.

The updated Environmental Statement 2022 has the same structure as the Environmental Report 2021. The content and environmental indicators can easily be compared year by year. The statement provides a clear and accurate image of Teollisuuden Voima Oyj's operations and their impact on the environment. The environmental system is implemented by setting goals. Achievement of the goals and implementation of the system is monitored by the environmental team and management reviews. The updated Environmental Report 2022 with environmental indicators, which describe the impact of the system, meet the EMAS 1221/2009 requirements for updated environmental statement as well as the requirements of EU 2017/1505 for annexes I-III and requirements of EU 2018/2026 for the annex IV.

The dedicated level of Teollisuuden Voima Oyj's commitment to a high standard of safety, quality and environmental protection, and continuous improvement is shown in the updated Environmental Report 2022.

At Kirkkonummi, the 10th of February 2023

DNV Business Assurance Finland Oy Ab
EMAS-accredited verifier
FI-V-0002

Esa Notkonen
Lead Auditor, Verifier

Group-level policies

The Group-level policies have been approved in the meeting of the TVO Group's Management Board on 9 November 2020.

Safety culture

TVO Group and its entire personnel are committed to a high standard of safety culture.

Safety culture is comprised of organisational practices and individuals' attitudes. Thanks to the safety culture, all factors that affect the nuclear power plant's safety will receive attention in proportion with their significance and are given priority in decision making.

Group-level policies

TVO Group and its personnel comply in their actions with the policies defined by the Group.

Applicable laws, decrees, and official regulations as well as international agreements are strictly followed. TVO Group sets objectives for its operations, which are stricter than those set out in the applicable laws.

Issues are dealt with transparently within the Group. Reporting of development needs, detected shortcomings, nonconformances and errors is encouraged.

TVO Group requires its partners and their personnel working at Olkiluoto to be committed to the high safety culture and high-quality operating methods. This means that the companies and personnel in a direct or indirect contractual relationship engage in responsible operations according to TVO Group environmental, nuclear safety and quality policy, and information security principles.

Policy on nuclear safety and quality

The nuclear safety and quality policy includes nuclear safety, radiation protection, nuclear material supervision and quality.

NUCLEAR SAFETY

TVO Group is committed to maintaining operating conditions where efficient procedures can be implemented by taking safety, quality, and costs into account. This ensures the capacity to also produce competitive electricity in a safe and reliable manner over the long term.

TVO Group's operations shall not cause any damage to people, the environment or property.

RADIATION PROTECTION

In all their radiation protection activities, TVO Group and its personnel are committed to following the ALARA (As Low As Reasonably Achievable) principle. According to the principle, individual and collective radiation doses are kept as low as possible by practical measures.

Restricting the amount of doses and keeping the amount of radioactive emissions as low as possible are already accounted for when designing the structures and functions. All employees shall observe matters affecting radiation protection in their work.

In addition to authority guidelines, the development of radiation protection operations also takes international recommendations into account.

NUCLEAR SAFEGUARDS

TVO Group takes good care of nuclear material and ensures that it does not get into the hands of unauthorized persons.

QUALITY

Work practices of a high standard are followed within TVO Group, which creates a basis for safe and economically efficient operation.

The professionals in nuclear industry who work at TVO Group are expected to show unfaltering compliance with procedures and verified execution of their own work. On the level of individual employees, this refers to a prudent approach to work, i.e., compliance with the STAR principle (Stop, Think, Act, Review). The personnel shall be aware of the safety significance of their work and utilise methods developed for the management of human errors which are employed in the Group.

Risk management is implemented on a regular and consistent manner. Any risks affecting operation, and in particular safety, are identified already at the operational planning phase.

We consider our internal and external customers equally important. We perform all work tasks appropriately, according to schedule, and with high quality.

TVO Group develops co-operation with its suppliers so that the safety, availability, and environmental friendliness of the plant units remain at a high international level.

Corporate social responsibility policy

The corporate social responsibility policy covers the environment, energy efficiency, procurement, personnel, occupational health and safety, and communication.

ENVIRONMENT AND ENERGY EFFICIENCY

TVO Group operates in accordance with the principle of sustainable development and produces environmentally friendly nuclear electricity. The Group recognises the environmental and energy aspects of its operation and minimises the related adverse impacts at all phases of electricity production. Operational objectives are specified in compliance with the principle of continual improvement. TVO Group monitors the impact that its operations have on the state of the environment, and when necessary, launches immediate corrective actions.

TVO Group ensures that the personnel and other persons working at the Olkiluoto nuclear facilities have competence and expertise in matters related to the environment and energy efficiency.

The objective of TVO Group is to prevent and further reduce the already low emissions of radioactive substances. Abnormal events in the plant process are anticipated and preparedness for the prevention of environmental damage caused by them has been established.

TVO Group acknowledges the importance of its overall responsibility for all the phases of the fuel cycle. The Group monitors and supervises the management of environmental issues implemented by the fuel suppliers. TVO Group requires the suppliers to assume responsibility for the securing and development of living conditions in the surroundings of uranium production and processing plants, taking indigenous peoples into consideration. Fuel management extends from the uranium mines all the way to final disposal according to the “from bedrock to bedrock” principle.

TVO Group is committed to improving the efficiency of energy production. The Group monitors its own energy consumption and improves its efficiency by taking energy aspects into account in the operations. Plant unit modernisation projects are implemented to improve the energy efficiency of the power plant process.

Opportunities for improvement of energy efficiency are considered in investments, modifications and procurement. The level and performance of energy efficiency are also reported on in the annual environmental report. TVO Group minimises the amount of waste through the improvement of the use of raw materials and the reuse of waste. The goal is to increase the relative share of waste delivered for reuse and to decrease the amount of radioactive waste. TVO Group also takes efforts to reduce the amount of spent fuel through optimisation of the use and properties of fuel.

Sustainable utilisation of the environment is taken into account in the development of the Olkiluoto area and expansion of operations. The design and construction of any new nuclear power plant units aims to minimise harm and disruption to the environment.

PROCUREMENT

TVO Group employs procurement activities of a high standard to ensure safe, competitive and reliable production as well as the long service life of the plant units.

The products and services purchased by the Group are required to meet the requirements for safety, quality and the environment which the Group has specified. The availability of requisite products and services is ensured by means of long-term agreements based on mutual trust and partnership.

Factors particularly emphasised by TVO Group in the selection of suppliers include the continuity of the supplier’s operation, security of supply, management of quality and environmental aspects, as well as competitiveness, with domestic and local suppliers given priority. Supplier assessments are based on the safety significance of the products and services to be ordered. The quality of deliveries is monitored, and when necessary, corrective actions are taken without delay.

TVO Group conducts its relations with the supplier chain and business partners in a responsible and ethical manner. TVO Group expects its partners to uphold a high level of safety culture and responsible practices in their own operations.

PERSONNEL

The objective of TVO Group is to ensure that the whole personnel is motivated, carry out their tasks in a responsible manner and commit to observing the agreed practices and procedures.

TVO Group makes sure that the human resources of the Group are competent and adequate to guarantee the achievement of the objectives specified for the Group.

TVO Group offers the employees opportunities for self-development in their work and profession and for the improvement of their competence by taking advantage, according to their own

individual needs, of the training programmes provided by the Group. TVO Group offers competitive rewards and encourages employees to work profitably, to meet their goals, and to work to a high standard every day.

TVO Group provides its personnel with opportunities for the maintenance of their work ability. The principles of the HR policy are implemented through good cooperation with the personnel. The objective of TVO Group is to ensure the equality and well-being of the work community where no discrimination is approved and which promotes the implementation of equality.

HEALTH AND SAFETY

The goal of health and safety activities in TVO Group is to promote health and occupational safety by a proactive approach.

A good atmosphere is maintained in the work community within the Group, ensuring good working conditions as well as equality of treatment. We do not approve of any form of harassment or bullying in the workplace.

The goal of every employee in terms of occupational safety is to look after the safety of oneself and others. When making decisions related to occupational safety, TVO Group is committed to consultation and participation of workers, and their possible representatives.

COMMUNICATION

TVO Group increases mutual trust by supporting open and responsible interaction with all of its stakeholders in the local region, the Finnish society and the international cooperation network of the nuclear industry.

The Group promotes public knowledge about and acceptance of nuclear power by participating in social debate and communicating transparently about operations and events at the Olkiluoto nuclear facilities.

TVO Group uses internal communication to support an interactive work community culture and ensures that the personnel understand the goals and policies of the Group and are aware of the Group’s financial and production situation. TVO Group’s contact with stakeholders is based on high ethical principles and thus reinforces confidence in the operation of both the Group and the stakeholders, posing no threat to the reputation or objectivity of either.

Sponsorship of culture, sports, research and non-profit activities is part of the corporate social responsibility of TVO Group. Factors considered in the selection of cooperation partners and sponsorship recipients include reputation, values and compatibility with the strategic objectives and principles of the Group. Finnish origin, a groundbreaking role, reliability, and interaction are some of the key selection criteria.



Production policy

The production policy covers the operation and maintenance of the plant, and the expansion of the production capacity.

OPERATION AND MAINTENANCE

The objective of the operation and maintenance activities implemented by TVO Group is to ensure uninterrupted, predictable and competitive electricity production. Nuclear and operating safety are always given priority.

Plant safety and reliability are developed systematically. Modification and renovation projects are implemented at the plant in accordance with pre-approved plans to ensure as long a service life as possible for the plant.

Systematic test and inspection activities of an appropriate scope are carried out to verify the safe and reliable operation of the plant. Plant maintenance operations are implemented in a well-planned manner, predicting potential disruption situations, and preparing for the measures the situations require.

EXPANSION OF PRODUCTION CAPACITY

TVO Group follows development in nuclear power technology and participates in international cooperation both with power plant suppliers and with nuclear power companies.

The electrical output of the existing plant units in Olkiluoto will be increased where possible by taking advantage of the latest available technology.

The best economically feasible technology that minimises environmental impacts over the entire life cycle of the plant unit is applied in the design and implementation of Olkiluoto 3.

Corporate security policy

The corporate security policy covers the safety of production and operation, personnel safety and facility security, rescue and emergency preparedness, and information security.

SAFETY OF PRODUCTION AND OPERATION, PERSONNEL SAFETY, AND FACILITY SECURITY

Procedures related to safety and security are implemented in a systematic, proactive and comprehensive manner. The procedures are designed to guarantee the safe operation of the plant, as well as the physical integrity of the personnel and others working at the plant.

RESCUE AND EMERGENCY PREPAREDNESS

TVO Group maintains and develops preparedness for special conditions. Exercises in rescue and emergency operations are arranged systematically and regularly.

TVO Group maintains at all times its awareness of risks related to the company, the personnel and the operating environment.

INFORMATION SECURITY

Information security procedures are in TVO Group designed according to the significance and risk of each function. The objective is to secure nuclear safety, financial interests and the privacy protection of the personnel, to verify the availability of correct and reliable information, and to avoid any damage resulting from information processing.

TVO Group's information security procedures cover the availability, authenticity, and confidentiality of information, as well as procedures for the management of access rights.

Group employees are granted access rights to the Group's information and information systems as required for the performance of their work tasks. Disclosure of information to third parties is only allowed when this is in the interest of the Group. Information disclosed by other parties is in TVO Group processed using at least the information security procedures used or required by the disclosing party.

