



2022
**ANNUAL AND
SUSTAINABILITY
REPORT**

tvo

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TVO’s Annual Report 2022

TVO’s Annual Report includes the Annual and Sustainability Report, the Corporate Governance Statement, as well as the Report of the Board of Directors and Financial Statements. The reports are published as separate files on TVO’s website: www.tvo.fi/financialpublications.



Annual and Sustainability Report

The Annual and Sustainability Report contains an overview of TVO’s business and the most important sustainability aspects and objectives, it also includes the review by the President and CEO.



Corporate Governance Statement

The Corporate Governance Statement describes the management systems and the tasks of the governing bodies.



Report of the Board of Directors and Financial Statements

The Report of the Board of Directors and the Financial Statements report on the Company’s financial performance. The Report of the Board of Directors contains the non-financial information required by the Accounting Act.



TVO in brief

TVO – nuclear power for the good of the climate

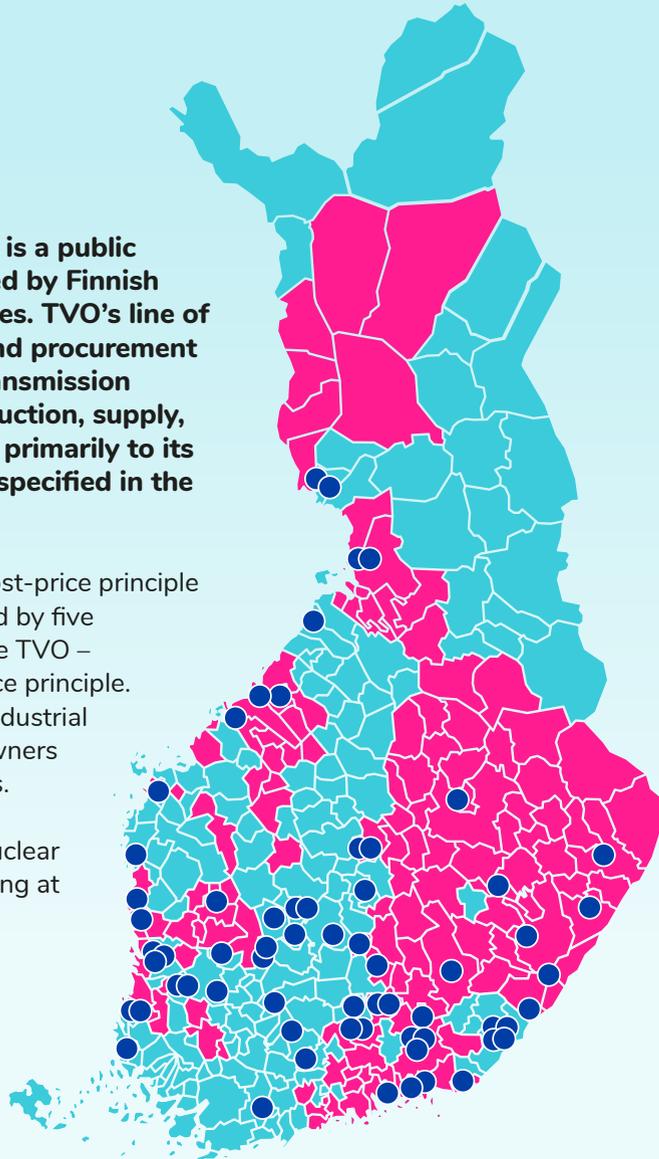
Teollisuuden Voima Oyj (TVO) is a public limited liability company owned by Finnish industrial and energy companies. TVO's line of business is the construction and procurement of power plants and power transmission equipment as well as the production, supply, and transmission of electricity primarily 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. TVO's shareholders are Finnish industrial and energy companies, whose owners include 131 Finnish municipalities.

TVO produces climate-friendly nuclear power at three plant units operating at Olkiluoto in Eurajoki: Olkiluoto 1 (OL1), Olkiluoto 2 (OL2), and Olkiluoto 3 (OL3).

 The Finnish municipalities that are owners of TVO

 The industrial sites of the owners



Key facts



Turnover

€358.2 million



Electricity production

16.35 TWh



TVO personnel

1,005 people



TVO's values:

Responsibility, transparency, proactivity, and continuous improvement.

Subsidiaries and joint ventures



An electricity production company



A consulting services company fully owned by TVO



A final disposal company owned 60% by TVO and 40% by Fortum Power and Heat Oy



A consulting services company fully owned by Posiva



The year 2022

11 April

The Olkiluoto Visitor Centre opened its doors to the public after a two-year break due to COVID-19.

31 May

The construction of Posiva's encapsulation plant building reached the stage of nuclear installations.

10 June

Annual outages completed at Olkiluoto.
A maintenance outage took place at OL1, and a refuelling outage was carried out at OL2.

24 June

The excavation of Posiva's first five actual deposition tunnels was completed in ONKALO.

6 July

The European Parliament accepted nuclear power in the EU Taxonomy on sustainable finance.
Therefore, nuclear power is classified as an environmentally sustainable investment under certain criteria.

8 December

The support for nuclear power in Finland is stronger than ever.
According to survey results published by Finnish Energy, the total support for nuclear power is at a record level of 83%.

All eyes on OL3

The most significant milestones in 2022 were reached in the commissioning of OL3, TVO's newest nuclear power plant unit.

12 Mar

Electricity production was started at OL3.

30 Mar

Tests according to the test production programme were completed at the 30% power level.

24 Sep

Tests according to the test production programme were completed at the 60%–80% power levels.

30 Sep

OL3 operated at the full 1,600 MW power for the first time.

27 Dec

Full power tests continued after a 10-week break, as the analysis of the damage to the feedwater pumps was completed.



The test production of OL3 is progressing with the goal of starting regular electricity production in March 2023.

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

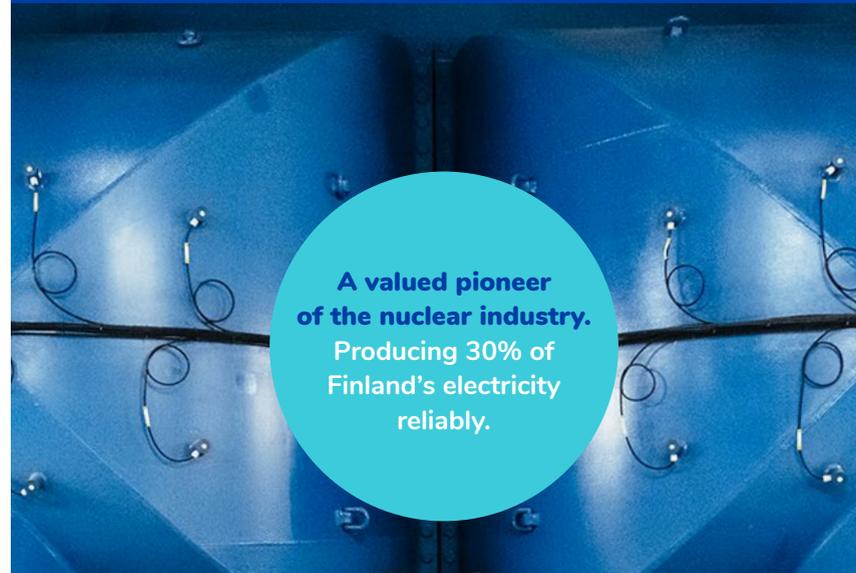
Strategy

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 on 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 at Olkiluoto in the mid-2020s.



TVO's vision 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."

Operating environment



The transition in the operating environment of the energy industry continues to point strongly in a climate-friendly direction. The electricity price crisis has led to a lot of discussion in Finland as well as internationally. The role of nuclear power is highlighted in both the mitigation of climate change as well as offering stable and predictable base load power which stabilises price fluctuations on the electricity market.

Nuclear power plays a strong role in Finland's national climate and energy strategy, which was submitted to the parliament in June. According to the strategy, Finland's electricity consumption, which will grow in the future, will

be primarily covered with nuclear and wind power. Nuclear power is also seen as a solution for reducing the emissions from district heating and the production of hydrogen.

According to recent polls, nuclear power is widely supported by Finnish society. In a survey by Finnish Energy, 65 percent of the respondents wanted to increase the amount of nuclear power, while 18 percent considered the current production capacity to be appropriate. A survey on values and attitudes carried out by Finnish Business and Policy Forum EVA showed a similar result: 67 percent of the respondents were in favour of the additional construction of nuclear power as the best solution for increasing electricity production.

According to a forecast by the International Energy Agency (IEA), reaching net zero emissions by 2050 requires nearly doubling the global production capacity of nuclear power. The background modelling for the European Commission's 2050 climate-neutrality goal (the "Clean Planet for All" communication) predicts that the nuclear power capacity in the EU will remain on approximately the same level until 2050.

Several countries have strengthened their commitment to nuclear power on a global level as well. In February 2022, for example, France declared that it will build six new large reactors as of 2028, with an option to build eight more by 2050. Last autumn, Poland announced

that it is ordering several reactors from Westinghouse as well as from Korea Nuclear & Hydro Power. In October 2022, the new government in Sweden decided in its government programme to request Vattenfall to analyse additional construction of nuclear power. In December, the Netherlands announced its plans to build two new reactors. Outside Europe, China and India are continuing their nuclear energy programmes. Moreover, Korea and Japan have revoked their nuclear phase-out plans.

In addition to conventional large plants, several countries are interested in small modular reactors (SMRs). In Canada, for instance, Ontario Power Generation declared that it will commission the

country's first commercial SMR by 2028. In 2022, the International Atomic Energy Agency (IAEA) started the Nuclear Harmonization and Standardization Initiative, which focuses particularly on the harmonisation of SMRs. Similarly, the EU and European industry operators are preparing their own SMR partnership programme which aims at the rapid commissioning of SMRs in Europe.

During the year, nuclear power was accepted in the EU Taxonomy on sustainable finance. The Russian invasion of Ukraine has also impacted energy politics particularly in the EU. For example, the Commission has stated that hydrogen produced with nuclear power is one solution for phasing out Russian gas.

Resources:



FINANCIAL RESOURCES

- Variable and fixed costs paid by the owners (Mankala principle)
- Financing from shareholders and loan markets



INFRASTRUCTURE

- The OL1, OL2, and OL3 plant units
- Final disposal facility for spent nuclear fuel
- Other infrastructure at Olkiluoto, e.g. the operating waste repository, interim storage facility for spent nuclear fuel, and battery energy storage system



PEOPLE & COMPETENCE

- Approximately **1,000** experts
- Contractors and consultants
- Long careers and a high level of training: **11.6** training days/person
- Internationally valued nuclear power expertise based on years of experience and covering the entire lifecycle of operations
- R&D investments: EUR **17.1** million



INTELLECTUAL CAPITAL

- Corporate culture and values: nuclear professionalism
- Olkiluoto and ONKALO® brands



COMMUNITY RELATIONS

- Active stakeholder cooperation and societal influencing
- International cooperation in nuclear industry organisations

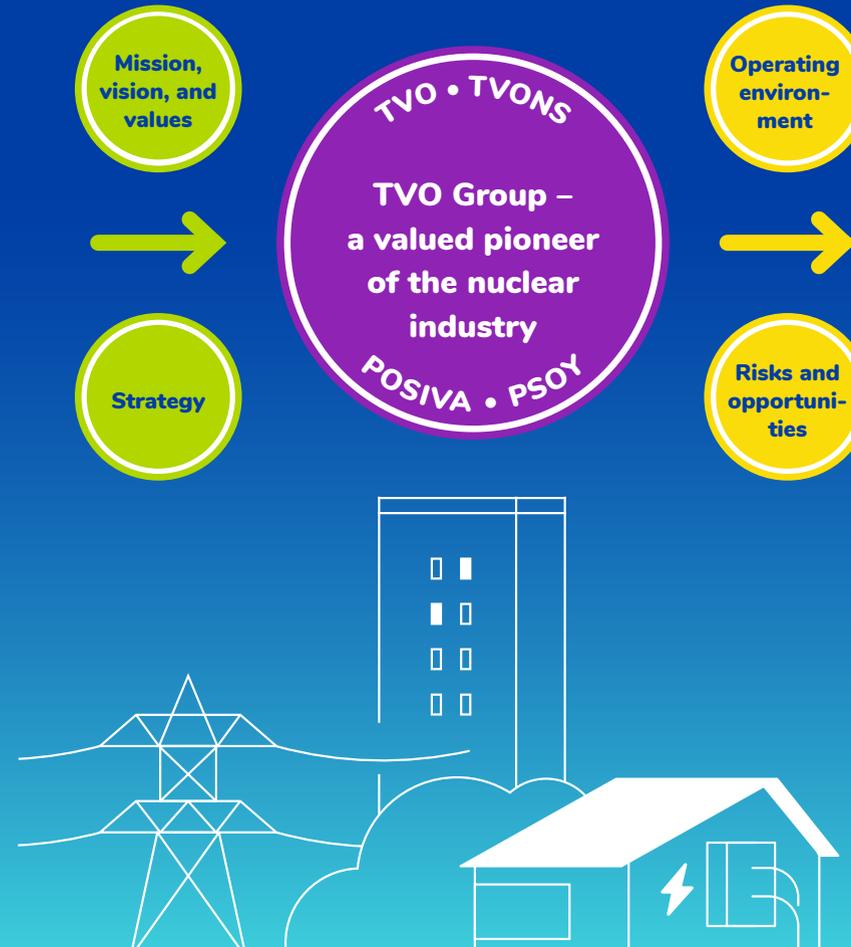


NATURAL RESOURCES

- Use of seawater as the plant units' cooling water: **3,352** million m³
- Uranium fuel: **33.64** t
- Olkiluoto's built environment: ca. **170** hectares

Value creation

The TVO Group utilises different resources, thus creating societally significant impacts through its operations.



Impacts:



FINANCIAL IMPACTS

- Electricity delivered to shareholders: **16,316** GWh
- TVO Group turnover: EUR **358.2** million
- Investments: EUR **339.0** million
- Business opportunities for partners and suppliers in Satakunta and elsewhere
- Property tax to the municipality of Eurajoki: EUR **16** million



PEOPLE & COMPETENCE

- Sick leave percentage: **3.8%**
- Employee satisfaction **68.7/100** (personnel survey, 2021)
- Strengthening and upholding nuclear power expertise
- Pioneering final disposal in the world
- Close collaboration with educational institutions
- Exemplary safety culture
- High load factors: **93.0%**



COMMUNITY RELATIONS

- Support for nuclear power at a record high level in Finland: **83%** views nuclear power positively ("Energy Attitudes" survey, Finnish Energy)
- TVO's reputation index **82/100** in the stakeholder survey (2021)
- Regional economic impacts in Satakunta



NATURE

- Ca. **13** million t CO₂ emissions avoided with electricity production
- Stable nuclear power increases the resilience of the electricity system and works as a platform for increasing renewable electricity
- The final disposal solution for spent fuel enables the production of sustainable nuclear electricity
- Efficient land use: produced electricity in relation to Olkiluoto's built environment: **9,618** GWh/km²
- The thermal load of cooling water to the local sea area **31.1** TWh

* The figures presented in the model concern the year 2022, unless stated otherwise.

Sustainability at the core of all operations

Responsibility is an integral part of the TVO Group's strategy and one of its values. For the licensee of a nuclear power plant, a high level of responsibility is a prerequisite for operations at all organisational levels.

The significant sustainability aspects identified in the TVO Group lay the foundation for the further development of operations, and they have been used as the basis for the TVO Group's Sustainability Roadmap 2030. The TVO Group is committed to the promotion of six UN

Sustainable Development Goals that are relevant to its operations.

The Group's sustainable development efforts emphasise social value creation and, in 2022, this aspect has focused on the commissioning of OL3. With regular electricity production at OL3, Olkiluoto will produce approximately 30 percent of Finland's electricity while safely managing the entire nuclear power lifecycle – from bedrock to bedrock.

In this chapter:

- 10 Responsible leadership
- 13 Sustainability Roadmap 2030
- 16 Environmental management
- 17 Effects of climate change on the business
- 19 Stakeholder cooperation
- 21 Responsible procurement operation
- 23 Research and development



Responsible leadership

The cornerstones of responsible leadership and operating practices are TVO's values, on which the Group-level policies and the Code of Conduct are based. TVO's objective is to operate in a responsible, transparent, and proactive manner while continuously improving its operations.

Responsible leadership takes into account the entire TVO Group, including the jointly owned company Posiva and its subsidiary Posiva Solutions (PSOY). The objectives and principles of responsible business operations, including the policies and the Code of Conduct, also apply to subsidiaries and jointly owned companies.

The TVO Group complies with valid laws, regulatory guidelines, and principles of good governance in all its operations. The regulations by the Radiation and Nuclear Safety Authority (STUK) and requirements laid down in the nuclear power plant guides (YVL Guides) are also followed. Everybody working at the TVO Group is required to comply with the legislation as well as the regulatory guidelines and regulations, the principles of good governance, and the Group's voluntary commitments.

The Codes of Conduct updated in April 2021 and approved by the Boards of Directors of the TVO Group companies lay down the TVO Group's principles of responsibility in business operations as well as in interactions within the Group and the surrounding society. There are separate Codes of Conduct issued for the TVO Group's personnel and for partners and subcontractors. The TVO Group's subcontractors are informed of the Code of Conduct by, for example, including the Code of Conduct in the contracts signed with subcontractors and partners. The Group's employees and subcontractors working in Olkiluoto complete training related to the Code of Conduct as part of their introductory training. The TVO Group has a procedure in place for reporting any Code of Conduct violations and suspicions of the misuse of insider information, also anonymously. All reports of possible Code of Conduct violations are processed by TVO's Internal Auditing in a manner that guarantees under all conditions the rights and privacy of the person making the report and the person suspected of a possible Code of Conduct violation or misuse of insider information. Any possible events that violate the Code of Conduct are addressed by supervisors, the Company management or internal audit.



TVO's operational system covers the production operations at the Olkiluoto nuclear power plant, maintenance and development of production capacity, construction of additional production capacity, and the related steering and resourcing functions. 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 that has been approved

by STUK. The implementation, functionality and effectiveness of the operational system is regularly tracked through internal audits and management reviews.

TVO's operational system meets the requirements of the following procedures and standards, among others:

- » Quality management system ISO 9001:2015, STUK YVL A.3 Management system for a nuclear facility
- » Environmental management system ISO 14001:2015, EMAS Regulation 1221/2009, and Commission Regulation 2017/1505
- » Energy efficiency system (ETJ+)
- » Occupational health and safety management system ISO 45001:2018

LEARN MORE:

- [Group-level policies](#)
- [Code of Conduct](#)

Sustainability efforts occur on several levels

The management of and the efforts taken in relation to the most significant aspects of sustainability concern the entire organisation of the TVO Group, including the Management Group, the business units and the service functions.

The highest decision-making authority in matters concerning sustainable development belongs to TVO's Board of Directors. Among other things, TVO's Board of Directors approves the Group's strategic objectives and operational guidelines, such as its values, Group-level policies, and the Code of Conduct. The most important aspects of sustainability are dealt with in the meetings of the Board of Directors and the Committees appointed by the Board from among its members; for example, the Nuclear Safety Committee deals with matters related to the promotion of safety culture. The Audit and Finance Committee's responsibilities include monitoring the development of shareholder value. The work of the OL3 Committee focuses on the monitoring and promotion of the power plant project designed to ensure the supply of electricity for society and a positive impact on the climate.

The Board of Directors deals with sustainability issues regularly according to its annual schedule. Every Board meeting deals with nuclear and occupational safety matters. In 2022, the Board has also covered topics related to sustainability reporting, risk management, safety and safety culture, legal matters, and internal audit in its meetings. The Board has covered and approved the non-financial information in the Report of the Board of Directors 2022, including the Group's material sustainability aspects. The Board takes into account the views



of stakeholders in its work, for example through the results of the stakeholder survey and the materiality analysis for sustainability.

As part of the Board's self-evaluation carried out once a year, the Board evaluates its own operations, among other things, in internalising the Company's mission, strategic goals, operational guidelines, and operating principles and handling key issues, as well as in operating in accordance with the corporate governance

system. The self-assessment also evaluates the emphasis on the importance of safety and the monitoring of the state of the safety culture.

The President and CEO, with the approval of the Management Group, is responsible for the objectives and planning relating to the TVO Group's sustainability. The Management Group is in charge of the implementation of the strategy, strategic projects, and strategic goals, as well as the development of new business

opportunities. Furthermore, it assists the President and CEO in the planning and management of the Group's strategic operations.

In 2022, the main responsibilities of the Management Group concerning the different areas of sustainability were as follows:

- » Social responsibility and stakeholder relations: **Jaana Isotalo**, Senior Vice President, HR, Training, Communications and Corporate Relations
- » Economic responsibility: **Anja Ussa**, Senior Vice President, Finance, IT, Business Development and Assistant Services
- » Environmental responsibility: **Veli-Pekka Nurmi**, Senior Vice President, Safety and Security Services
- » Business ethics and compliance: **Ulla-Maija Moiso**, Senior Vice President, Legal Affairs
- » Risk management: **Lauri Piekkari**, Senior Vice President, Treasury and Risk Management

Sustainability objectives are also taken into account in the Management Group's remuneration. In 2022, the Management Group's performance bonuses were linked to the introduction of proactive safety metrics and the goal of zero accidents leading to absence during the annual outages.

Managerial and supervisory personnel have the task of initiating discussions about the Group's policies as well as the

values and responsibilities on which they are based, and of controlling that laws and regulatory provisions are complied with in the activities of each responsibility area. Regarding legal and ethical issues, employees can turn to the legal unit, the internal auditing unit, or the safety unit. The internal auditing unit also ensures that legislation and regulatory requirements are taken into account in the organisation's activities.

The TVO Group also has a Sustainability Team, which includes members from the Management Group and experts of different responsibility areas. The duties of the Sustainability Team include the following:

- » making decisions on sustainability goals, policies, operating plan, and indicators
- » considering stakeholder expectations
- » monitoring the sustainability goals, actions, and indicators
- » preparing, monitoring, and developing the implementation of the corporate social responsibility policy and Code of Conduct
- » reporting sustainability issues to the President and CEO and Management Group once or twice per year.

Material sustainability aspects

With the help of a materiality analysis for sustainability, the impacts on the environment, people, and economy that are the most relevant for the TVO Group's stakeholders have been identified. In



In addition to its personnel, the TVO Group's most important stakeholders include its shareholders, the authorities, investors, decision-makers, the local community, subcontractors, the media, and the general public. The TVO Group's materiality analysis was updated in autumn 2022, and the guidelines in the Global Reporting Initiative (GRI) Standards (2021) were used as the basis in the definition of materiality.

The materiality analysis comprised various work stages: background research, stakeholder interviews, and a targeted online survey to the stakeholders.

The background research for the materiality analysis included an analysis of the operating environment and peer companies, which considered, among other things, the TVO Group's operating environment analysis carried out in connection with the preparation of the strategy, ESG assessments concerning TVO, a 2021 stakeholder survey, the biodiversity roadmap published by Finnish Energy in June 2022, the EU taxonomy criteria for nuclear power, and feedback received from risk management and visitor activities.

During stakeholder interviews, representatives of the TVO Group's internal and external stakeholders were interviewed with the aim of understanding their views on both positive and negative impacts of the Group on the environment, people, and economy. Both actual and potential

impacts were discussed during the interviews. Thereafter, an online survey was sent to a broader distribution of the Group's stakeholders with the same aim of understanding the Group's different impacts. The distribution included representatives of the personnel, Management Group, Board of Directors, shareholders, subcontractors, authorities, investors, political decision-makers, and local actors.

The results from different stages were prioritised according to the significance of the impacts, and processed and verified in meetings by the Sustainability Team and the Board of Directors' Audit and Finance Committee. As a result of prioritising the different impacts, a list of material sustainability aspects was created, reflecting the Group's most significant impacts on the environment, people, and economy:

1. Safe, climate-friendly, and stable electricity production
2. Responsible final disposal of spent fuel and exporting competence
3. Transparent and ethical business
4. Responsibility in the supply chains and partnerships
5. Creation of added economic value
6. The support and development of employees' competence
7. Healthy and equal work community
8. Biodiversity and sustainable land use
9. Minimising releases into the air, water, and soil
10. Circular economy; energy and material efficiency

Sustainable Development Goals

Based on the most significant impacts from its operations, the TVO Group is committed to the promotion of six UN Sustainable Development Goals (SDGs):



There are a total of 17 UN SDGs. The goals aim at achieving a more sustainable and equal world by 2030.

Sustainability Roadmap 2030



The TVO Group has in place the Sustainability Roadmap 2030, which defines the targets for its sustainable development efforts. The roadmap's targets and indicators are based on the Group's material sustainability aspects. Furthermore, the targets support the UN Sustainable Development Goals.

The Sustainability Roadmap was developed and introduced in the TVO Group in 2021. The roadmap was developed through interviews with the Group's personnel, workshops organised in the Sustainability Team, and discussions with members of the Management Group. The finalised roadmap was approved by the TVO Group's Management Group.

The roadmap includes specific targets defined for the TVO Group's different sustainability aspects for the purpose of furthering these aspects within the Group. Moreover, corresponding UN SDGs were also determined for each target. With the help of the roadmap, the TVO Group aims at target-oriented sustainable development by specifying both short and

long-term targets. The outlook until the year 2030 enables the systematic planning of sustainable development in the longer term.

The Sustainability Roadmap will be updated in 2023 based on the results of the materiality analysis for sustainability, which was updated in autumn 2022.

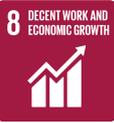
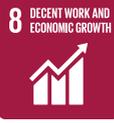


The roadmap's targets are based on the Group's material sustainability aspects."

Sustainability Roadmap 2030

SDG	TARGET: CLIMATE-FRIENDLY ELECTRICITY FOR SOCIETY	ACTUAL RESULT 2022
 	Climate-friendly electricity production <ul style="list-style-type: none"> In 2022, OL3 is in commercial use, which enables the production of about 30% of Finland's electricity in Olkiluoto, as well as the avoidance of about 23 million metric tonnes of CO₂ emissions annually (compared with coal). 	<ul style="list-style-type: none"> OL3 was connected to the national grid and electricity production started on 12 March 2022. Commercial operation is to start in March 2023.
	Responsible nuclear waste management <ul style="list-style-type: none"> Posiva's final disposal activities begin according to plan in the mid-2020s. Final disposal is carried out on an industrial scale – about 400 tU spent fuel is disposed safely and according to cost estimates by 2030. 	<ul style="list-style-type: none"> The operating licence application for the final disposal facility was submitted to the Finnish Government in December 2021, and its processing has advanced according to plan. The progress of Posiva's project is described in more detail in the chapter "Final disposal of spent nuclear fuel" (p. 52–54).
	Emissions <ul style="list-style-type: none"> The TVO Group's operations are climate neutral by 2030. The thermal load of cooling water does not exceed 56.9 TWh annually. Radioactive emissions to air and water are kept clearly below authority limits (continual). 0 environmental accidents (in the serious/significant category) annually. 	<ul style="list-style-type: none"> The TVO Group's Scope 1 greenhouse gas emissions were 3,076 t CO₂eq. Scope 2 emissions were 65,635 t CO₂eq. The thermal load of cooling water was 31.1 TWh. Radioactive emissions were clearly below authority limits. There were 0 environmental accidents.
	Biodiversity <ul style="list-style-type: none"> Efficient land use: share of produced electricity with respect to the surface area of built environment ca. 15,647 GWh/km² from 2023 onwards. At least one voluntary project promoting biodiversity carried out annually. 	<ul style="list-style-type: none"> The amount of produced electricity with respect to the surface area of Olkiluoto's built environment was 9,618 GWh/km². Preparations were made during the year for establishing a new natural meadow at Olkiluoto in 2023.
	Circular economy <ul style="list-style-type: none"> Minimisation of waste volume and recycling waste as material, at least 55% annually by 2025 and 60% annually by 2030. 0 kg of landfill waste annually. 	<ul style="list-style-type: none"> Approximately 57% of waste was recycled as material. There was 0 kg of landfill waste.
	Energy efficiency <ul style="list-style-type: none"> Commitment to the goals set out in the Energy Efficiency Agreement period 2017–2025, as well as the goals of the following period. Goals are advanced by carrying out at least four location reviews and one plant measurement annually in Olkiluoto. 	<ul style="list-style-type: none"> Four location reviews were carried out, and plant measurements were performed at the OL1 and OL2 plant units after the annual outages.
SDG	TARGET: HIGH-CLASS SAFETY CULTURE	ACTUAL RESULT 2022
	Safety culture <ul style="list-style-type: none"> No deficiencies in IAEA's safety culture levels 1 and 2 (continual). 	<ul style="list-style-type: none"> One incident challenging the level of safety culture occurred relating to observed deficiencies in carrying out fire inspection rounds.
	Occupational health & safety <ul style="list-style-type: none"> No serious accidents in the TVO Group, including contractors (continual). The TVO Group's accident frequency (accidents per one million working hours) below 1, including contractors, by 2030. 	<ul style="list-style-type: none"> There were no serious accidents. The accident frequency was 4.8 accidents per one million working hours.
	Radiation protection <ul style="list-style-type: none"> Individual radiation doses incurred in Olkiluoto below half of authority limit (continual). 	<ul style="list-style-type: none"> The highest annual individual dose was 6.5 mSv. (authority limit: 20 mSv).
	Plant safety <ul style="list-style-type: none"> No events at INES 1 or higher (continual). 	<ul style="list-style-type: none"> There were two INES 1 events at the Olkiluoto power plant.



SDG	TARGET: ADDED ECONOMIC VALUE	ACTUAL RESULT 2022
	Customer-oriented & competitive activities <ul style="list-style-type: none"> The load factor of the Olkiluoto plant units is 90–95% as a rolling three-year average (continual). The rolling three-year production cost average is below 20 €/MWh in 2022. Calculating from OL3's first full production year, the rolling three-year average is below 30 €/MWh. Reported for the first time in 2026. 	<ul style="list-style-type: none"> The rolling three-year average of the load factor was 93.1% The rolling three-year average of the production cost was 19.91 €/MWh.
	Nuclear power as a desired production form <ul style="list-style-type: none"> Reputation index over 75 (excellent) in the stakeholder survey (continual). 	<ul style="list-style-type: none"> The reputation index in the latest stakeholder survey (2021) was 82 (excellent).
	Funds ready for final disposal <ul style="list-style-type: none"> The necessary funds for final disposal are secured through payments to the Finnish State Nuclear Waste Management Fund (continual). 	<ul style="list-style-type: none"> TVO's liability for nuclear waste management in the Finnish State Nuclear Waste Management Fund was EUR 1,839.6 million for the end of 2022.
SDG	TARGET: WELL-BEING OF EMPLOYEES & STRONG NETWORKS	ACTUAL RESULT 2022
	Occupational health <ul style="list-style-type: none"> Personnel survey (People Power Index) result at level AA (good) achieved by 2025. Sick leaves (% of working time) below 3% annually. Employees' pension insurance (TyEL) category below 4 (continual). 	<ul style="list-style-type: none"> In the latest personnel survey (2021), the People Power Index was at level A (satisfactory). TVO's sick leaves were 3.8% and Posiva's were 1.9%. The employees' pension insurance category was 2 for TVO and 1 for Posiva.
	High-class expertise <ul style="list-style-type: none"> Actualisation rate of competence surveying over 90% annually. Inspection rate of individual training plans over 90% annually. 	<ul style="list-style-type: none"> The actualisation rate of competence surveying was 76.4%. The inspection rate of individual training plans was 76%.
	Professional development <ul style="list-style-type: none"> Employees' changes in position over 10% annually. Actualisation rate of navigation discussions over 90% annually. 	<ul style="list-style-type: none"> 4.8% of the Group's permanent employees changed positions. The figure includes only actual changes in assignments within the Group. 99% of Group employees took part in at least one navigation discussion.
	Employer role <ul style="list-style-type: none"> Recruiting over 100 students for internships annually. 	<ul style="list-style-type: none"> The TVO Group employed a total of 107 trainees during the year.
	Responsible supply chain <ul style="list-style-type: none"> All suppliers of raw uranium and its conversion services are evaluated every 3–5 years depending on the supplier. 	<ul style="list-style-type: none"> Two supplier evaluations were carried out for suppliers of raw uranium and its conversion and enrichment stages. Evaluations were also carried out for a fuel manufacturer's two fuel factories, as well as four subcontractors of a fuel manufacturer.
	Stakeholder cooperation <ul style="list-style-type: none"> The most important stakeholders feel that the TVO Group's activities can be trusted, and that the Group communicates transparently on its operations. The indicators measuring experiences on trust and transparency are over 75, i.e. excellent, in the stakeholder survey (continual). 	<ul style="list-style-type: none"> Trust in the TVO Group's activities was 81 (excellent), and the view on communications was 72 (good) in the latest stakeholder survey (2021).
	Research & development <ul style="list-style-type: none"> R&D operations advance the safety, business activities, and future technological solutions of the plant units and final disposal of spent fuel with the help of networks and research projects (continual). 	<ul style="list-style-type: none"> The central R&D projects and cooperation partners are described in the chapter "Research and development" (p. 23–25).
Reliable use of the plant units <ul style="list-style-type: none"> 0 unplanned automatic scrams (continual). Annual unplanned energy unavailability factor <0.4% (1.5 days/year) of total production by 2024. 	<ul style="list-style-type: none"> There was one unplanned automatic scram. The unplanned energy unavailability factor was 1.0%. 	
Increasing final disposal expertise <ul style="list-style-type: none"> 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 (continual). 	<ul style="list-style-type: none"> Posiva's employees had 5.5 training days/employee. PSOY's turnover was EUR 2.95 million. 	
SDG	TARGET: TRAILBLAZER IN THE NUCLEAR INDUSTRY AND FINAL DISPOSAL	ACTUAL RESULT 2022
	Research & development <ul style="list-style-type: none"> R&D operations advance the safety, business activities, and future technological solutions of the plant units and final disposal of spent fuel with the help of networks and research projects (continual). 	<ul style="list-style-type: none"> The central R&D projects and cooperation partners are described in the chapter "Research and development" (p. 23–25).
	Reliable use of the plant units <ul style="list-style-type: none"> 0 unplanned automatic scrams (continual). Annual unplanned energy unavailability factor <0.4% (1.5 days/year) of total production by 2024. 	<ul style="list-style-type: none"> There was one unplanned automatic scram. The unplanned energy unavailability factor was 1.0%.
	Increasing final disposal expertise <ul style="list-style-type: none"> 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 (continual). 	<ul style="list-style-type: none"> Posiva's employees had 5.5 training days/employee. PSOY's turnover was EUR 2.95 million.

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:

CLIMATE-FRIENDLY ELECTRICITY PRODUCTION

- » In 2022, OL3 is in commercial use, which enables the production of about 30% of Finland's electricity in Olkiluoto, as well as the avoidance of about 23 million metric tonnes of CO₂ emissions annually (compared with coal).

EMISSIONS

- » The TVO Group's operations are climate neutral by 2030.



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 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 competitive 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

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. 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 Socioeconomic 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) for activities under the TVP Group's operational control. In addition, significant metrics concerning the climate and the environment are presented

in the Environmental Balance Sheet of this report (p. 38).

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

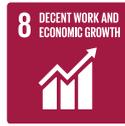
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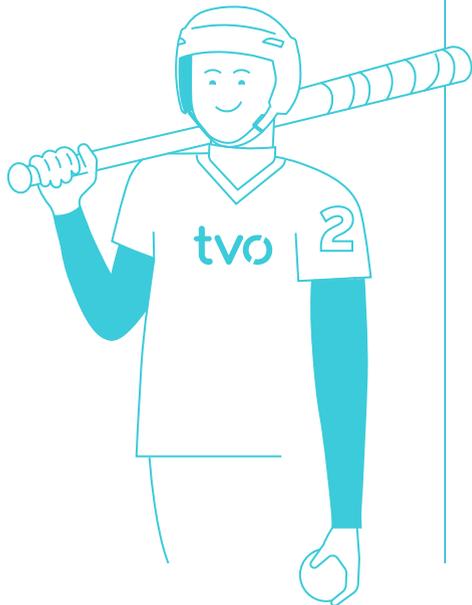




Targets:

STAKEHOLDER COOPERATION

- » The most important stakeholders feel that the TVO Group's activities can be trusted, and that the Group communicates transparently on its operations. The indicators measuring experiences on trust and transparency are over 75, i.e. excellent, in the stakeholder survey (continual).



Stakeholder cooperation

Active and transparent interaction with stakeholders is an essential principle that guides the TVO Group's operations. The Group's interaction with all stakeholders always follows strict ethical principles.

Local communities

Stakeholders play a key role in terms of sustainable operations. The most important local stakeholders identified by the TVO Group are local residents, council members of nearby municipalities, the chamber of commerce, local schools, and other local opinion leaders.

The inclusion of local communities in decisions relating to nuclear power and final disposal activities is extensive and continues throughout the entire lifecycle of operations. The TVO Group organises regular interaction through various forums, such as the Municipal Cooperation Committee. The Municipal Cooperation Committee was established in the 1970s at TVO's initiative, and it has been active ever since. The Committee is a forum for dialogue and exchange of information, providing local municipal decision-makers with first-hand information. In addition to representatives of TVO and

Posiva, the Committee includes representatives appointed by the municipalities of Eurajoki, Rauma, Nakkila, Eura, and Pori. TVO also maintains close dialogue with Eurajoki in the municipality's own cooperation team. Furthermore, TVO participates in the work of the Vuojoki Foundation and Vuojoki Cooperation Group. TVO is also a member in the Eurajoki Water Protection Association.

TVO engages in free-form interaction with the residents of the neighbouring areas at open coffee and chat events and the SuomiAreena public debate forum, where discussion concerning the Company and nuclear power is lively. In 2022, this activity was expanded due to the commissioning of OL3. In addition to SuomiAreena, there were open coffee and chat events at nine market squares in the local region. Outside Satakunta, discussions took place at the Nordic Nuclear Forum 2022 in Helsinki in the summer and at the Energy 2022 event in Tampere in the autumn. TVO had an exhibition stand at both of the events.

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.

The Olkiluoto Visitor Centre normally receives some 13,000–15,000 visitors each year. The visitors are openly told about the TVO Group's operations, and their questions are answered. The visitor activities resumed in spring 2022 after a two-year break due to COVID-19.

The traditional collaboration with schools was restored to how it was before the pandemic. 5th, 8th, and 9th graders and upper secondary school students from Eurajoki visited Olkiluoto, each group with a specific theme. The popular science and technology camps for primary school age children were also arranged for the first time in two years.

IMPACTS ON THE LOCAL COMMUNITY AND SURROUNDING ENVIRONMENT

The TVO Group has a significant impact on employment in the surrounding area,

and the Group's most significant positive impact on the local community is related to the region's economic well-being. The local community has a positive attitude towards investments by the TVO Group, such as OL3 and Posiva's final disposal project. The property taxes paid by TVO and Posiva have a significant economic impact on the municipality of Eurajoki, and also the neighbouring municipalities in the region benefit from the taxes paid by the Group's employees. The TVO Group is a major employer and provider of economic well-being in the region, both directly and indirectly. The purchases of products and services create jobs and provide income for local people. TVO's most significant measurable negative effect on the region is an increase in seawater temperature in the vicinity of the plant area. The increase in the seawater temperature is regularly monitored and measured, as are its impacts on the sea area.

Memberships in nuclear industry organisations

The TVO Group is an active participant in the Finnish and international nuclear power communities as well as in various organisations and communities of the nuclear energy sector.



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The most significant international memberships are those in nucleareurope, the trade association for the nuclear energy industry in Europe, and the World Association of Nuclear Operators (WANO), which focuses on the development of nuclear safety. Furthermore, the TVO Group complies with the recommendations and requirements of the International Atomic Energy Agency (IAEA).

Visits

In April 2022, the Olkiluoto Visitor Centre opened its doors to the public again after a two-year break due to COVID-19. A total of 8,897 people visited Olkiluoto by the end of the year. Visitor activity was quite high, with OL3 starting and travel and movement made possible for the public.

Digital visits, which were started during the pandemic, were integrated into the other visitor activities. Digital visits are particularly useful for groups that need to travel a longer distance to Olkiluoto. In 2022, a total of 2,412 people visited Olkiluoto digitally.

Sponsorship activities

The TVO Group supports sports, cultural endeavours, and non-profit activities. The TVO Group's sponsorship principles are built on the Company's values, and the sponsored activities must be in line with the TVO Group's strategy and operating principles. When selecting partners and sponsorship recipients, the emphasis is on offering opportunities for recreational

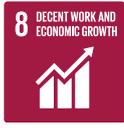
activities to children and young people in the local area. The TVO Group mainly supports activities that reach large numbers of people and are open for everyone.

The most important sponsorship recipients in 2022 were:

- » Rauman Lukko (ice hockey; representative team and juniors)
- » Pallo-lirot (football; representative team, girls' football, juniors, and supervised exercise for children)
- » Fera Association (Finnish baseball; women's representative team and junior girls' teams)
- » Rauma Golf
- » Eurajoen Veikot (various sports)
- » The TVO Group supports the local community particularly by sponsoring sports, cultural endeavours, and associations.

In addition to sponsorships, the TVO Group makes annual donations to organisations, communities, and student groups who work for the public good. In 2022, donation recipients included Kriisikeskus Ankkurpaikk', a mental health centre in Rauma.

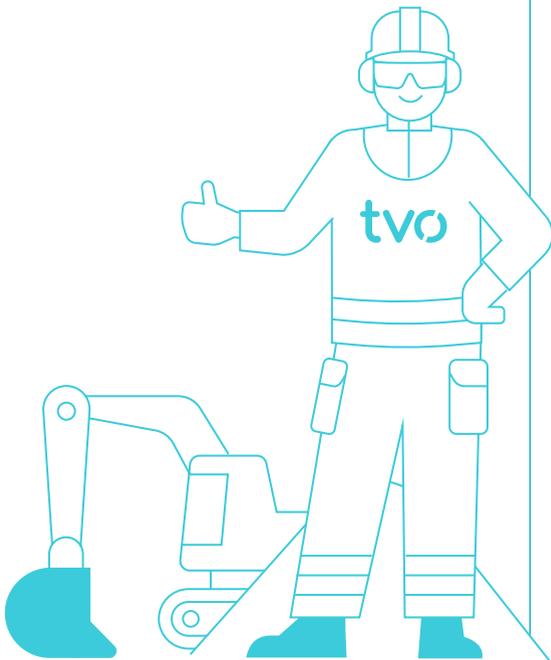
Decisions concerning sponsorships and donations are made by the TVO Group's HR Competence Centre together with the management of the Company. In line with the sponsorship principles, the TVO Group does not sponsor any activities that do not comply with the Company's values, ethical code, or principles of social responsibility, or any political or religious organisations or projects.



Targets:

RESPONSIBLE SUPPLY CHAIN

- » All suppliers of raw uranium and its conversion services are evaluated every 3–5 years depending on the supplier.



Responsible procurement operations

High-quality procurement ensures safe, competitive, and reliable production and the long-term operation of the plant units.

When selecting suppliers for the TVO Group, particular attention is paid to the continuity of the suppliers' operations, delivery reliability, quality, management of the environment and occupational health and safety, as well as competitiveness, while also valuing domestic and local suppliers. Suppliers are evaluated, delivery quality is monitored, and immediate corrective measures are taken when necessary.

The TVO Group only purchases products and services from evaluated and approved suppliers. The Group utilises a supplier classification that is performed for all suppliers. Suppliers are classified on the basis of how significant their operations are for the Group's safety and the potential risks inherent to its production operations. The purchased products and services must meet the TVO Group's requirements concerning safety, quality, and the environment. Furthermore, the TVO Group requires that contracting parties use operating methods that comply with the TVO Group's Code of



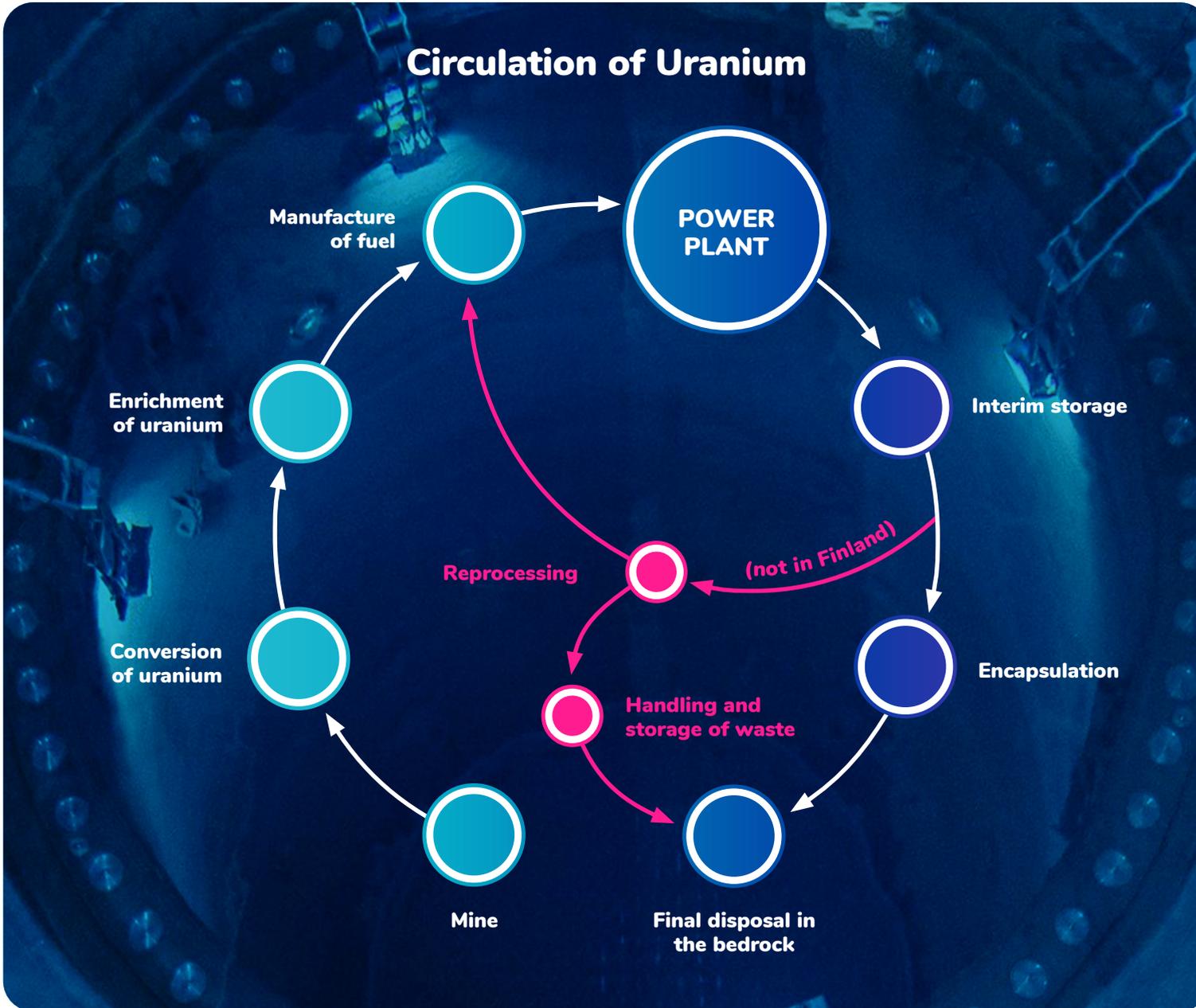
Conduct and policies. Orders are only placed with evaluated and approved suppliers.

Audits – a quality assurance method

The TVO Group's suppliers generally apply a level of requirements in accordance with the ISO 9001 quality

management system, ISO 14001 environmental management system, and the ISO 45001 occupational health and safety system. Auditing is one of the quality assurance methods used. The audits may be performed by the TVO Group itself or a third party. The TVO Group has the right to audit the management systems for quality, safety, information security, and the environment as well as the

operations of its contractual partners and subcontractors to the extent it considers necessary. Contractual partners are obligated to ensure that the above-mentioned right is included in all contracts between the contractual partner and its subcontractors in the entire supply chain. To validate the operations of the TVO Group and its subcontractors, STUK may participate in the audits.



Procurement of uranium

TVO has high-level in-house expertise regarding all the stages of the fuel procurement process. TVO procures its fuel mainly through a decentralised supply chain, entering into negotiations and making procurement contracts with each separate supplier at the various stages of the fuel production chain. There are several suppliers for each stage in the chain, and the procurement operations are regularly subjected to competitive bidding.

Furthermore, the composition of the fuel and the manner in which it is used are designed by TVO itself. The policy chosen by TVO clearly strengthens the Company's position as Finland's leading producer of nuclear power. Procurement operations are based on long-term contracts with leading suppliers. These companies have mining operations in many countries. If required, TVO also purchases additional batches and services from the market, the development of which is followed actively. Most of the uranium procured by TVO comes from Kazakhstan, Canada, and Australia. The fuel elements ordered by the Company are constructed and assembled in Germany, Spain, or Sweden.

TVO subjects fuel suppliers to strict evaluation

TVO employs a supplier evaluation process and only procures uranium and nuclear fuel refining services from



TVO employs a supplier evaluation process and only procures uranium and nuclear fuel refining services from suppliers who have passed the evaluation."

suppliers who have passed the evaluation. A systematic evaluation process precedes the closure of each supply contract. In addition to the requirements set for the products, the process also considers the reliability and sustainability of the supplier.

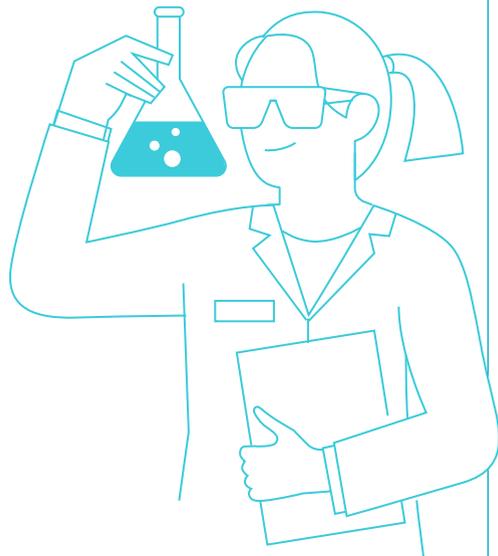
TVO's supplier evaluation also includes active monitoring and evaluations at fixed intervals. Remote monitoring in Finland and visits to production sites both provide TVO with an opportunity to examine the suppliers' practices and to intervene in their practices if necessary. The purpose of TVO's supplier evaluation is to ensure that suppliers pay appropriate attention to environmental issues, the well-being of personnel, and quality management. Special issues concerning mines are also considered, such as the impact of the mining operations on local people.



Targets:

RESEARCH & DEVELOPMENT

- » R&D operations advance the safety, business activities, and future technological solutions of the plant units and final disposal of spent fuel with the help of networks and research projects (continual).



Research and development

The key focus areas of TVO's research and development activities (R&D) include nuclear power plant operation and service life management, the processing and final disposal of nuclear waste and spent nuclear fuel, and creating new energy business opportunities for the TVO Group. The vision for R&D is to be a bold innovator and developer that enables the TVO Group to be a pioneer of the nuclear industry.

Modernisations and modifications carried out at the plant units, as well as the monitoring and use of new technology, create new research and development needs. Storage, handling, and final disposal of waste comprise another important research area.

The total R&D expenses in 2022 were EUR 17.1 million, of which most were used for R&D related to nuclear waste management. TVO is the largest contributor to the financing of Finnish national public research programmes on nuclear power plant safety (SAFIR2022) and nuclear waste management (KYT2022). In 2022, TVO paid a total of EUR 5.4 million in research fund-related contributions to the Finnish State Nuclear Waste Management Fund.

Important nuclear sector researcher and developer

Over the past few years, general developments in the industry and TVO's plant projects have significantly altered the needs for research and development within the nuclear energy industry. Expanding production and extending the operating life of the plant units are changing the goals of plant technology research and research into nuclear waste management.

The purpose of R&D activities is to use research to produce information supporting the safe operation and decommissioning of the Olkiluoto plant units. The aim is also to remain agile by testing new ideas and offering the TVO Group different new opportunities for experimenting.



The vision for R&D is to be a bold innovator and developer that enables the TVO Group to be a pioneer of the nuclear industry."



R&D focus areas

NUCLEAR SAFETY

- » Lifecycle management
- » Reactor physics
- » Transient and accident analyses

SUSTAINABLE DEVELOPMENT

- » Waste management
- » New concepts (Small Modular Reactors, SMR)
- » Fuel development
- » Resources

ECONOMIC FEASIBILITY

- » Fuel consumption
- » Capacity increases
- » New methods and procedures



Actions are guided by the following objectives:

- » **Economy:** Ensuring an operating life of 60 years for the plant units, possible operating life extension and the utilisation of higher fuel burn-up values.
- » **Safety:** The modernisation of existing plants while meeting all safety requirements and adding to the passive features of the safety systems.
- » **Sustainable development:** Surveying new energy business functions, developing the final disposal concept for nuclear waste, acquiring the necessary approvals, and placing operating waste safely in final disposal.

The actions aim at securing the functional prerequisites in the longer term while supporting the Company's financial goals and the safe operation of the plants.

In 2022, TVO was engaged in the following research projects, among others:

SMR2029 AND HYDROGEN SURVEY

The Small Modular Reactor 2029 (SMR2029) project was started at TVO in 2020. It's aim is to support TVO's long-term strategic planning and to produce information on small modular reactors (SMR) in order to support planning and decision-making. A key target of the project is to increase knowledge and understanding concerning the opportunities and challenges of SMR plants from TVO's point of view.

The key design basis for SMR plants is the modular structure of the main components and standardised serial production. The aim is to develop legislation and authority processing in order to make them correspond with the requirements of SMR plants as regards safety and feasibility. Matters related to legislation and authority processing include topics such as nuclear material safeguards, security arrangements, plant operation, continuous supervision, and final disposal. The practices and agreements related to these are being developed by the authorities in international cooperation, as well as where national legislation is concerned.

In 2022, the SMR2029 project investigated the use of SMRs in electricity and heat production, as well as the feasibility and profitability of different technical alternatives in Finnish circumstances and as part of the Finnish energy system. The project is carried out as part of the broader EcoSMR project funded by Business Finland and coordinated by VTT Technical Research Centre of Finland.

A lot has happened within the energy sector during the course of the SMR2029 project. TVO is preparing for a paradigm shift in the field of energy and surveying new areas of business that could offer added value for TVO's owners. Interest in SMR plants has remained high, and hydrogen has clearly emerged as a trend alongside them. At the moment, several notable actors are considering hydrogen

economy as a key part of a new energy system as we shift away from fossil fuels.

Hydrogen provides TVO with several opportunities to provide new added value for its owners, utilising its extensive competence in the nuclear energy industry. This is related to utilising current production capacity, constructing new capacity, and seizing new business opportunities.

ELECTRICAL AND I&C RESEARCH

Research in I&C technology focuses on solutions required for the maintenance of the I&C systems at the OL1 and OL2 plant units and the solutions required for the commissioning of OL3. Primary research areas include the ageing of electronics, the commissioning of digital I&C technology, and the enabling of digitalisation to support proactive maintenance.

FUEL RESEARCH

Fuel research is TVO's most important area of international research cooperation; its objectives include safe reactor operation, good fuel economy, and safe final disposal. Fuel research requires special expertise, available testing reactors, and hot cell studies, which are best obtained by means of international cooperation and by utilising international readiness for research. Research further specifies and validates the safe use of fuel and accident safety margins at higher burn-up. The behaviour of fuel in storage and after final disposal is another important field of study. TVO also participates in the



international OECD-NEA Studsvik Cladding Integrity Project (SCIP IV) to investigate the behaviour of fuel rods during various reactor transients, as well as phenomena and solutions related to the handling and storage of spent nuclear fuel.

NUCLEAR WASTE RESEARCH

The handling and final disposal of operating waste and the long-term safety of the operating waste repository (VLJ repository) are an important area of research and development for TVO. The long-term safety of the VLJ repository is assessed by means of safety analyses; as regards bedrock, this requires information regarding the geology of the nearby rock, hydrogeology, and groundwater chemistry. Furthermore, various material tests and material sample studies, such as a gas generation test, disassembly waste metal studies, and concrete dilution studies, are under way inside the VLJ repository.

3D PRINTING

A 3D printing project is under way at TVO, the aim of which is to gain access to a new method of manufacturing components for the nuclear energy industry. The digitalisation of spare parts is a major step towards more sustainable business and a smaller carbon footprint. It also generates cost savings while improving the availability of spare parts and making them quicker to acquire. In 2022, 3D printing was utilised in the replacement of transparent alarm signs in the alarm units in the main control



rooms of OL1 and OL2, which were otherwise no longer available.

Cooperation and networking

As regards R&D activities, TVO widely utilises both domestic and international networks. In Finland, the most important partners are other nuclear power companies, such as Fortum, and the research institutions VTT Technical Research Centre of Finland, Lappeenranta–Lahti University of Technology LUT, University of Helsinki, Aalto University, and Tampere University. In the field of international cooperation, TVO is active in R&D efforts on the Nordic level, with other European partners, and on a wider international scale. At the Nordic level, the cooperation mostly takes place through the Energiforsk research programme, and by participating in the funding of NKS and NPSAG research. At the European level, cooperation has been arranged through the Sustainable Nuclear Energy Technology Platform (SNETP), NUGENIA, and Euratom's research projects.

€17.1
million

The total R&D expenses
in 2022.



Uncompromising safety

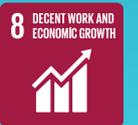
For the TVO Group, safety aspects form the outset of all operations and they are developed in accordance with the principle of continuous improvement.

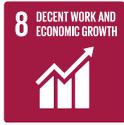
A high level of safety culture is the cornerstone of good and safe production. Strong commitment, responsibility, maintaining competence, and the continuous development of activities are prerequisites for the operation and maintenance of the plants.

In this chapter:

27 Safety

30 Safety culture





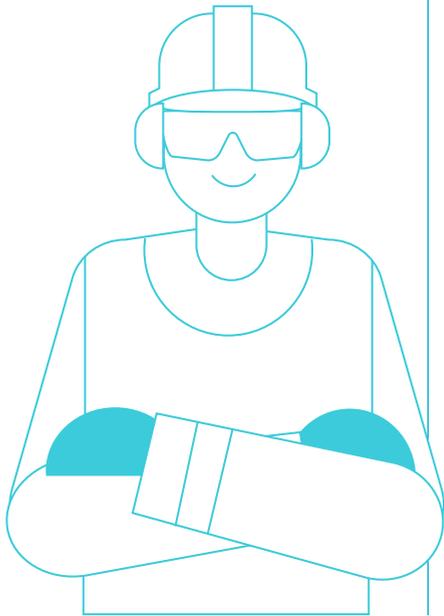
Targets:

SAFETY CULTURE

- » No deficiencies in IAEA's safety culture levels 1 and 2 (continual).

PLANT SAFETY

- » No events at INES 1 or higher (continual).



Safety

The safe operation of the Olkiluoto nuclear power plant is based on competent and responsible personnel, high-quality plant technology, the principle of continuous improvement, and independent internal and external supervision. TVO's activity management system meets the requirements for quality, the environment, and occupational health and safety. In order to ensure safe operations, TVO systematically assesses the level of its safety and safety culture, and all of the employees are committed to a strong safety culture.

TVO regularly assesses the state of overall safety in terms of production, nuclear safety, security and service life management as well as leadership, the organisation, and personnel. The level of safety is good.

The state of the safety culture is regularly assessed according to the IAEA's procedures. TVO's safety culture is estimated to be at a level where the strategic importance of safety has been recognised and proactive practices are employed. TVO aims to reach the highest possible level of safety culture. TVO has continued to employ various measures to maintain and develop the safety culture.



The onion graph indicates the currently used oversight model. The oversight model consists of the organisation's self-monitoring, independent verification within the organisation, third-party peer reviews, and regulatory oversight.

TVO regularly assesses and develops the operation of its plant units with the help of internationally used safety indicators. The sustainability goals related to safety and safety culture are described in more detail in the TVO Group's Sustainability Roadmap 2030 (p. 13).

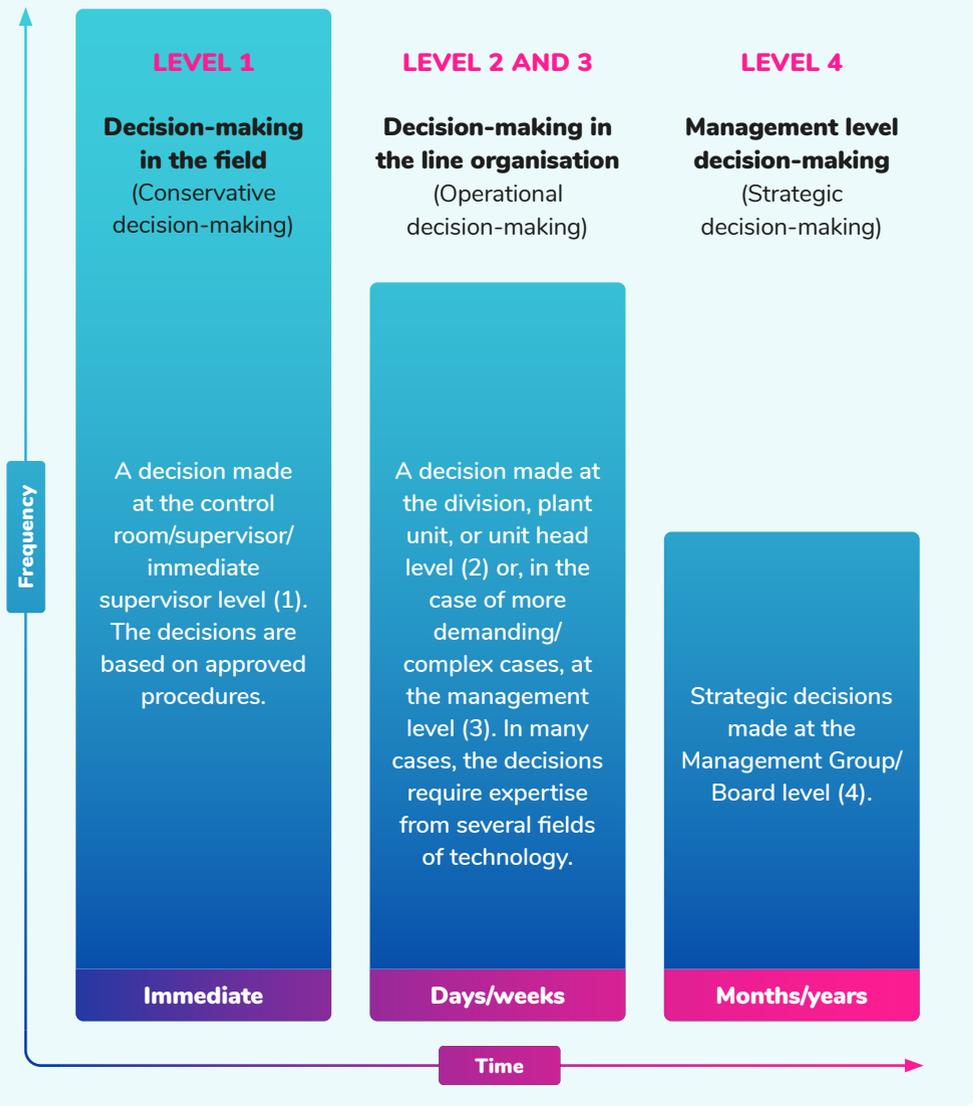
The Olkiluoto nuclear power plant units, OL1, OL2, and OL3, operated safely

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.

READ MORE ABOUT THE INES SCALE:
[click here](#)

Operating line's decision making process



Plant modifications to further improve safety

The OL1 and OL2 plant units are continuously maintained in good condition in terms of production and functionality through alternating refuelling and maintenance outages at the plant units.

The 2022 annual outages of the Olkiluoto nuclear power plant were started with a refuelling outage at the OL2 plant unit on 24 April. The refuelling outage was completed on 3 May. In addition to the refuelling, annually reoccurring service work was carried out during the annual outage of OL2.

The annual outage for OL1 was a maintenance outage that started on 8 May and ended on 10 June. In addition to the refuelling, preventive maintenance, and inspections, major work during the maintenance outage included the replacement of pumps and valves in the shut-down cooling system, replacement of containment electrical penetrations, inspection of the reactor pressure vessel bottom, seawater channel servicing and the concreting of one seawater channel, feed-water pump impeller replacements, the installation of one recirculation line, and the containment leak-tightness test.

To ensure safe annual outages under the exceptional conditions, TVO engaged in extensive cooperation with various authorities. Similarly to the previous years,

a COVID-19 group for annual outages convened twice per week. Numerous special procedures and arrangements were put in place during the annual outages to protect people's health in Olkiluoto and prevent the possible spread of the coronavirus, as well as to ensure safe and high-quality annual outages.

The annual outages were carried out successfully despite special arrangements due to COVID-19.

Two accidents at work resulting in absence occurred during the annual outages.

In addition to TVO's own personnel, approximately 490 external resources participated in the refuelling outage and approximately 830 external resources worked in the maintenance outage. Around 190 specialists arrived from abroad for the annual outages.

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. They involved matters such as the processing of waste, the management

of chemicals, energy efficiency, cleanliness, and general order. TVO's initiative operations also support stakeholder groups' 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 machinery and equipment. All of the oil was successfully recovered. There were also minor refrigerant leaks from cooling devices. The environmental authorities are informed of all significant environmental non-conformances and events.

Preparing for crises and emergencies

Fire protection, emergency preparedness, and security arrangements at the TVO Group are guided by laws, decrees, and authority regulations. The authority guidelines set the minimum requirements for activities, and the TVO Group carries out its emergency preparedness activities in line with its own action plans.

Olkiluoto has an emergency preparedness organisation that ensures operations are in compliance with the statutory emergency preparedness plan. The emergency preparedness organisation has been formed from the normal line organisation. In total, the TVO Group's emergency preparedness organisation includes 250 people in nearly 30 different roles.

Several exercises were organised for the emergency preparedness organisation at Olkiluoto in 2022, including emergency preparedness exercises and joint exercises with the fire brigade and the security organisation. The emergency preparedness exercises in 2022 focused on the arrival and departure routines during a possible release scenario as well as a prolonged emergency preparedness event.

Emergency exercises are arranged regularly each year, and their scope and duration vary according to the goals of the exercise. The aim of exercises, among other things, is to test the functionality and coverage of the instructions and to reinforce cooperation between the different actors. The key cooperation partners for the emergency exercises are STUK, the police, and the rescue department.

Preparing for emergencies is recorded in the Company's guidelines, and these guidelines are also used to create the plans for action, training, and exercises relating to emergency preparedness, fire safety, environmental safety, and security arrangements. Emergency preparedness is seen as an interesting and important part of nuclear professionalism. Guidelines are regularly reviewed and updated. The Group has instructions for crisis communication, and their functionality is also tested during the emergency exercises. Corporate Communications is responsible for crisis communication.



Corporate Security Expert Anni Lähdeoja:

"I find my work meaningful, my duties unique and people enriching"



Efforts are invested in the safety and security of people and the three plant units through a comprehensive precautionary approach. The emergency response organisation in Olkiluoto consists of 250 appointed people representing several different roles, as well as the operational and security personnel of the plants. The administration and coordination of this organisation is what Anni Lähdeoja does as her primary job.

The working day of a Corporate Security Expert is versatile and varying: it requires knowledge, or at least a wide understanding of causalities. The job includes, for example, planning and executing training events and exercises as well as maintenance of facilities and procedures for emergency response purposes. It also involves a lot of collaboration with rescue services, the Radiation and Nuclear Safety Authority of Finland (STUK) and many other operators. International peer reviews where the plant's own good practices are reviewed against those in other countries are also one form of cooperation.

Training events and exercises are the best part of the job. The large national emergency response exercise organised every three years is a particularly meaningful event. Exercises also create more ideas for new types of drills. Putting the many and varied plans to a test in practice supports development and helps meet the new circumstances in the changing world.

– We recently organised a decontamination exercise designed to practice arriving in and leaving from Olkiluoto during an emission incident. It was implemented for the first time in the spring this year in cooperation with rescue services and Satasairaala Hospital. It was an absolutely first-class experience that taught us a lot, Lähdeoja says.

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

Safety culture

The TVO Group's employees, suppliers, and subcontractors are committed to an uncompromising safety culture. Accordingly, all factors affecting the nuclear power plant's safety receive the attention warranted by their significance and are given priority in decision-making. The principle of continuous improvement and the safety culture are inherent features of all day-to-day work.

In practical work, safety culture means operating in accordance with the principles of nuclear professionalism. Nuclear professionalism means following common policies and guidelines, understanding the safety significance of the work, observing, reporting, and boldly influencing as well as learning from new experiences, with the understanding that results come from good collaboration. The most important aspect of nuclear professionalism is having a responsible attitude.

The development of management principles and working policies in a nuclear power plant has been carried out through defining the expectations for a nuclear professional and taking action in order to reinforce these expectations. The expectations for a nuclear professional are part

of TVO's activity management system. TVO also has in place a safety culture programme that aims to achieve the IAEA's highest safety culture level, i.e. to create a learning organisation.

Nuclear Professional Leader, a training programme for safety management that was started in 2021, was expanded with in-depth sections in 2022. In addition, supervisors' field work was strengthened with coaching discussions that particularly aimed at reinforcing the consideration of human and organisational factors in the conversations that take place in the field. In terms of continuous improvement, safety management was developed further by clarifying supervisor level roles and describing the essential cross-organisational processes in more detail. The Nuclear Professionalism Group is tasked with developing nuclear professionalism and thinking of ways in which human factors could be considered in the everyday life even better.



Clean base load power

The TVO Group's most important sustainability aspect is safe, climate-friendly, and stable electricity production. The production of nuclear power is low in emissions. Over the entire lifecycle of nuclear power, its emissions remain on the same level as wind power and hydropower.

Through its actions, the TVO Group is committed to supporting both national and international climate targets. The Finnish Government Programme (2019) aims for Finland to be climate neutral by 2035. The EU aims at reducing greenhouse gas emissions by at least 55 percent by 2030 (compared to 1990 levels), so that the EU's target for climate neutrality by 2050 can be reached. As a low-emission form of electricity production, nuclear power has a significant role in achieving these goals.

In this chapter:

- 32 The environmental impacts of nuclear power
- 33 Supply of electricity in Finland and its climate impact
- 34 Finland's greatest climate act
- 35 Responsibility for the environment and climate
- 36 Environment and energy efficiency programme
- 37 Follow-up of environmental impacts
- 38 Environmental balance sheet
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- 40 Raw materials and material efficiency
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- 45 Releases into water and soil
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- 50 Cooperation with authorities
- 52 Final disposal of spent nuclear fuel



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 the 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 the 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](#)

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 electricity produced and about one-fifth of electricity consumed in Finland in 2022.

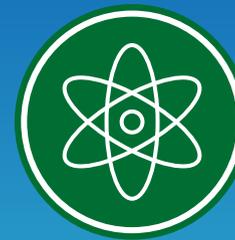
Electricity in every weather

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.

CO₂ emissions of different production modes during their lifecycle

Amount of carbon dioxide produced per 1 kWh of energy:



NUCLEAR
12 g



WIND
12 g



SOLAR
48 g



GAS
490 g

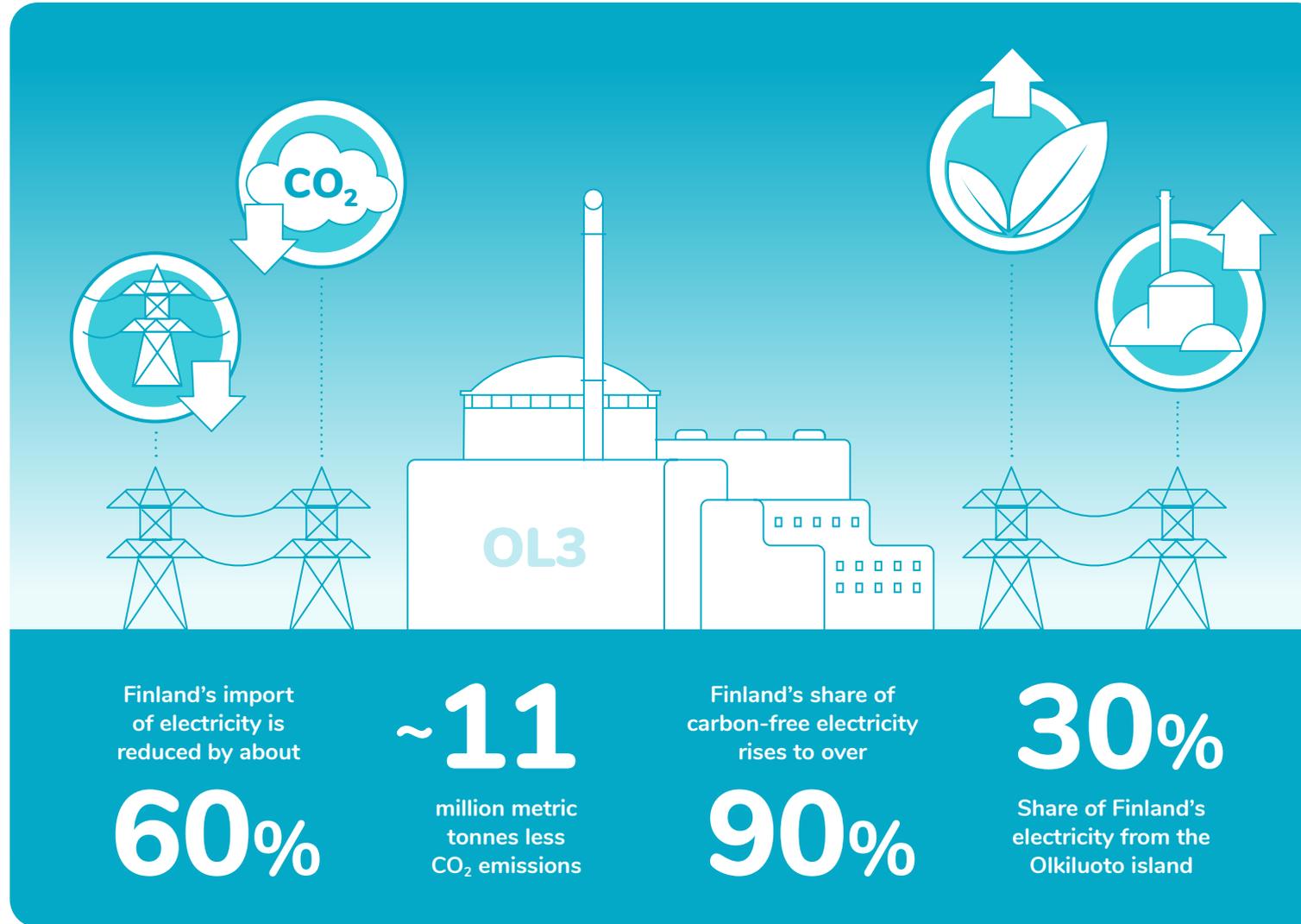


COAL
820 g

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 89 percent to approximately 92 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

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.

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.

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:



The targets and results of the Environment and Energy Efficiency Programme are presented in the Environmental Report

Follow-up of environmental impacts

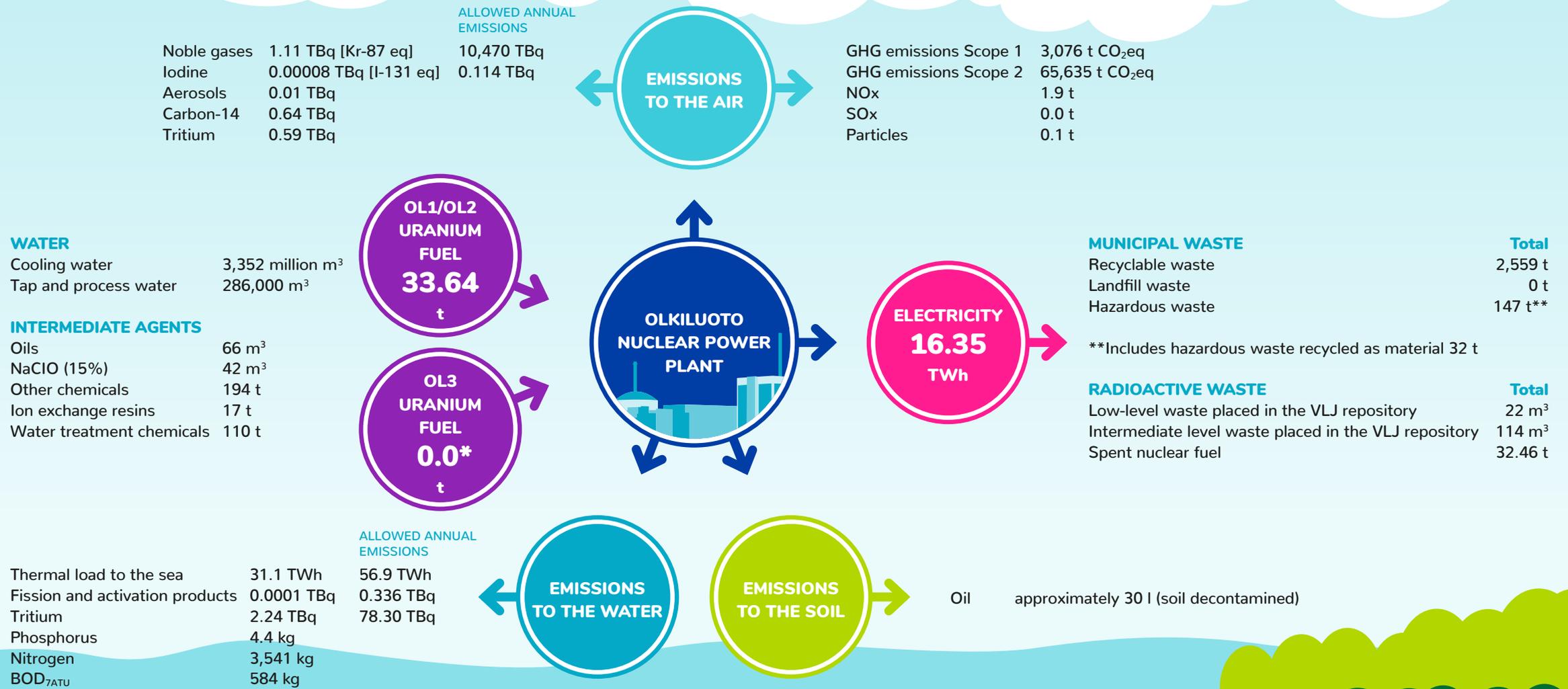
Under normal conditions, the environmental impacts from nuclear electricity production do not pose any harm to people or the environment. The impact of the Olkiluoto nuclear power plant's operations on land, sea, and air is continuously monitored. Based on the monitoring results, the operations only cause a minor environmental load.

The most significant environmental aspect of the Olkiluoto nuclear power plant is the production of climate-friendly electricity, and the most significant impact is the local warming of the seawater near the plant. Electricity produced during the reporting period was 16.35 TWh. The amount of cooling water increased in 2022 due to the commissioning of OL3, but the temperature of cooling water remained within the limits required by the environmental permit. Radioactive releases into the air and water from the nuclear power plant were extremely low. Commissioning tests carried out at OL3 created temporary environmental effects, such as nitrogen releases that were higher than estimated.

“Electricity produced during the reporting period was 16.35 TWh, and the cooling water temperature remained within the limits required by the environmental permit.”



Environmental balance sheet



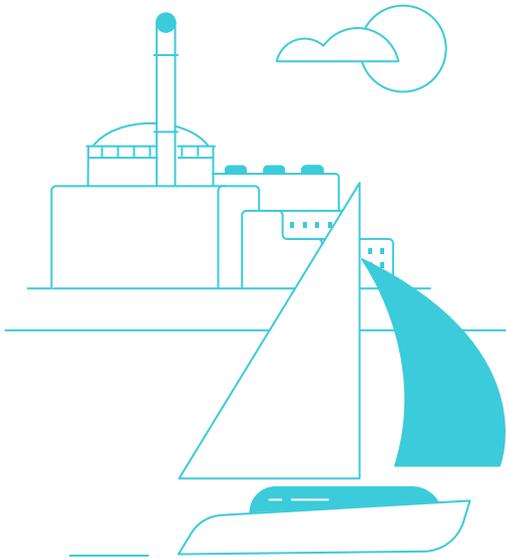
*Fuel was not loaded at OL3 during the year.



Targets:

EMISSIONS

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



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 warming of the seawater due to the thermal load was 31.1 TWh.”

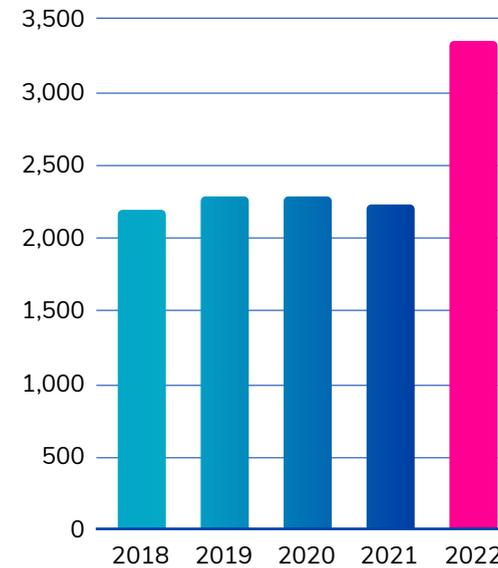
the cooling water discharge channel. Limit values have also been specified for the amount of cooling water (max. 4,415 million m³) and the thermal load (max. 56.9 TWh) in the environmental permit. None of the permit limits were exceeded in 2022.

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.

Water usage

Cooling water

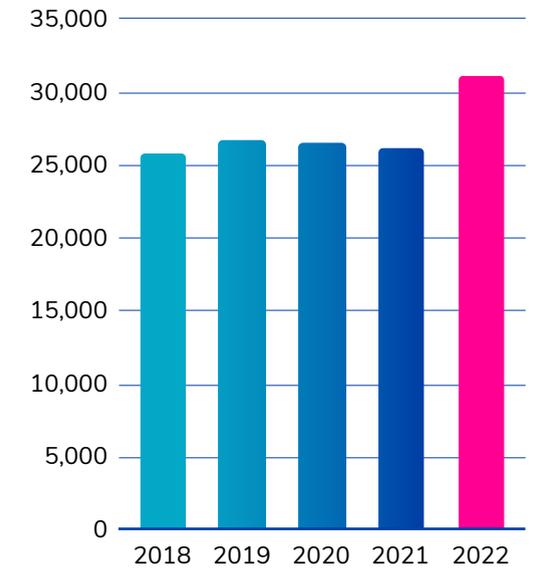


Warnings about the unfrozen area are issued to the local residents in newspapers and with ice warning signs. The warm cooling water extends the growth period in the unfrozen sea area and increases its overall biological production. Other biological effects caused by the cooling water are minor.

Emissions

Thermal load on the sea

GWh



The solid material is extracted from the cooling water at the debris handling building. During 2022, malfunctions occurred at the debris handling building for the OL1 and OL2 plant units. Modifications will be implemented at the debris handling building in spring 2023.

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 (other chemicals) are among the intermediate agents to be reported.

Reducing water consumption

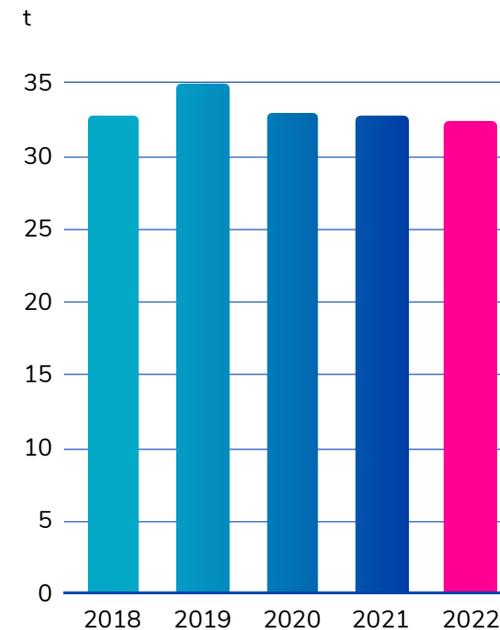
In addition to the seawater used as cooling water, the Olkiluoto power plant makes use of fresh water, which is used

as tap water and process water. The 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.

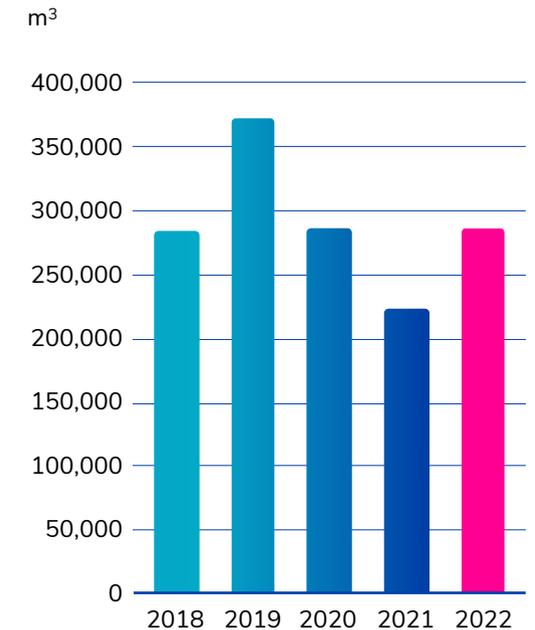
During annual outages, the fuel pool water is stored in storage pools and later reused. The recirculation of water reduces TVO's need for clean process water and the amount of process wastewater discharged from the plant by approximately 30,000 m³ each year. During the reporting year, 286,000 m³ of fresh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

“The recirculation of water reduces TVO's need for clean process water by 30,000 m³ each year.”

Material efficiency Nuclear fuel spent



Water usage Untreated water



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.



Targets:

RELIABLE USE OF THE PLANT UNITS

- » 0 unplanned automatic scrams (continual).
- » Annual unplanned energy unavailability factor <0.4% (1.5 days/year) of total production by 2024.

ENERGY EFFICIENCY

- » Commitment to the goals set out in the Energy Efficiency Agreement period 2017–2025, as well as the goals of the following period. Goals are advanced by carrying out at least four location reviews and one plant measurement annually in Olkiluoto.

Production and energy efficiency

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

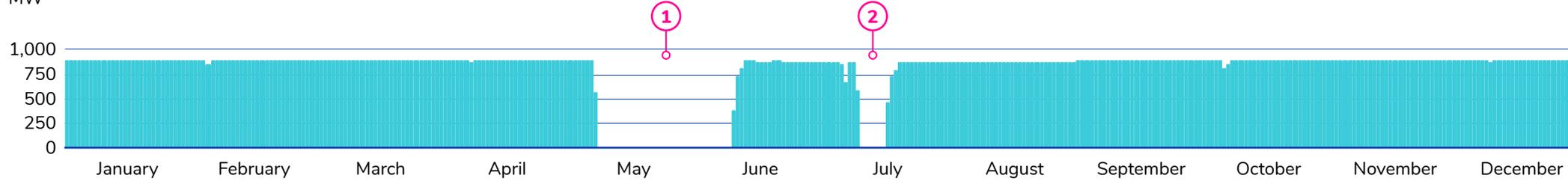
the basis for selecting the modifications to be performed. Plant measurements were performed at OL1 and OL2 after the annual outages. The expansion of the district heating network to OL3 was started at the end of the year.



OL1 Production

Average output

MW

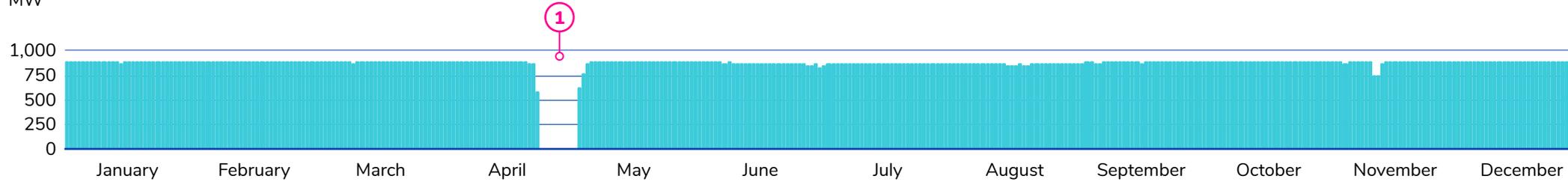


- 1. Annual outage
- 2. Cold shutdown to remove damaged fuel

OL2 Production

Average output

MW

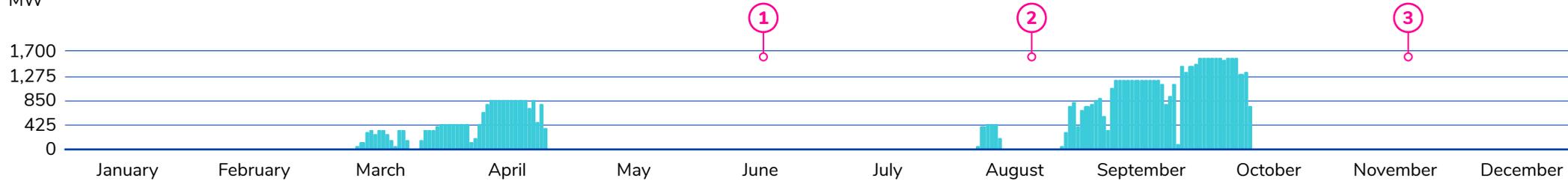


- 1. Annual outage

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. In 2022, 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

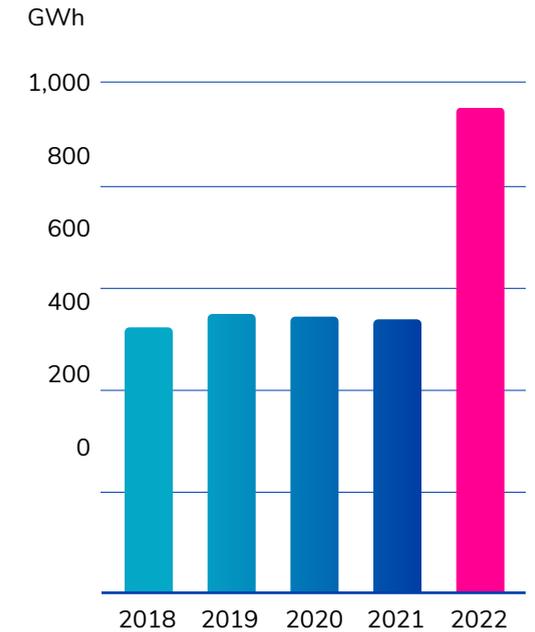


distribution from the Energy Authority. In 2021, the percentages were as follows: nuclear power 48.58, fossil-based energy sources and peat 44.47, and renewable energy sources 9.95.

In addition to in-house and purchased electricity, TVO's total energy consumption consists of the fuel consumption of the emergency diesel generators and reserve boilers. The total energy

consumption in 2022 was 955.65 GWh, of which 949.96 GWh came from electricity consumption and 5.69 GWh from fuel consumption.

Energy efficiency
TVO's electricity consumption



**20
GWh**

district heating from
the plant units to buildings
in Olkiluoto.



Targets:

EMISSIONS

- » Radioactive emissions to the air are kept clearly below authority limits (continual).

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 the plant units 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:

EMISSIONS

- » Radioactive emissions to the water are kept clearly below authority limits (continual).
- » 0 environmental accidents (in the serious/significant category) annually.



The releases of radioactive fission and activation products into water amounted to 0.04 percent and tritium emissions to 2.86 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. There were also minor refrigerant leaks from cooling devices.

Releases into water and soil

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	2.86	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

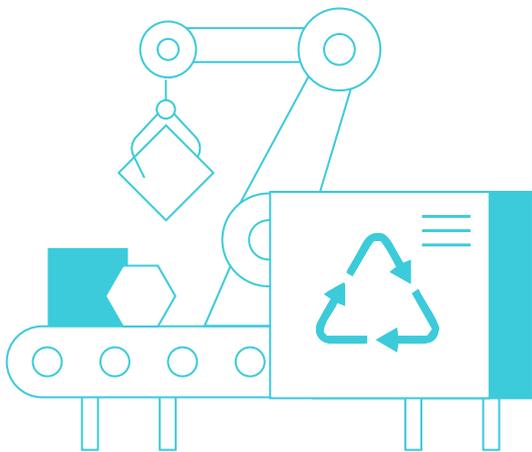
¹⁾ The permit regulation for the sanitary wastewater: The maximum BOD_{7ATU} value of wastewater discharged into the seas is 13 mg O₂/l and the maximum phosphorus concentration is 0.52 mg P/l. The minimum treating efficiency for the BOD_{7ATU} value and phosphorus is 95%. All values are calculated as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



Targets:

CIRCULAR ECONOMY

- » Minimisation of waste volume and recycling of waste as material, at least 55% annually by 2025 and 60% annually by 2030.
- » 0 kg of landfill waste annually.



Waste

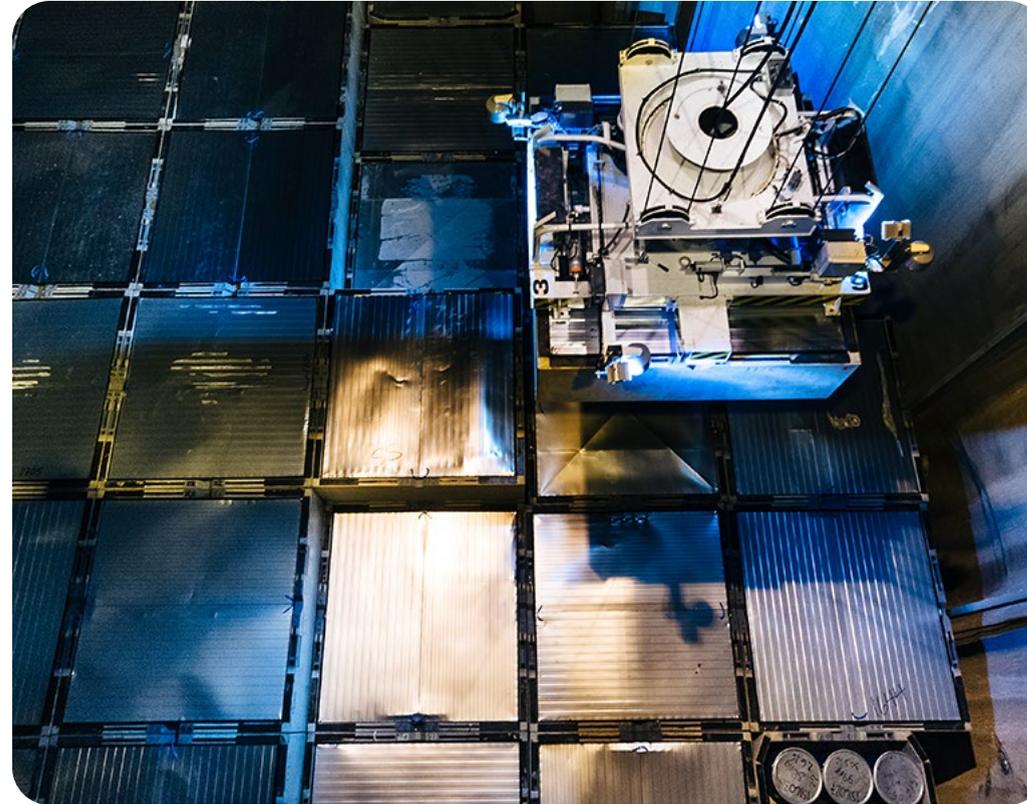
The TVO Group is committed to reducing the amount of waste and promoting its utilisation. Radioactive waste is isolated from the organic environment until its radioactivity has decreased to a harmless level. The TVO Group disposes of the radioactive waste it generates in a responsible manner.

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.

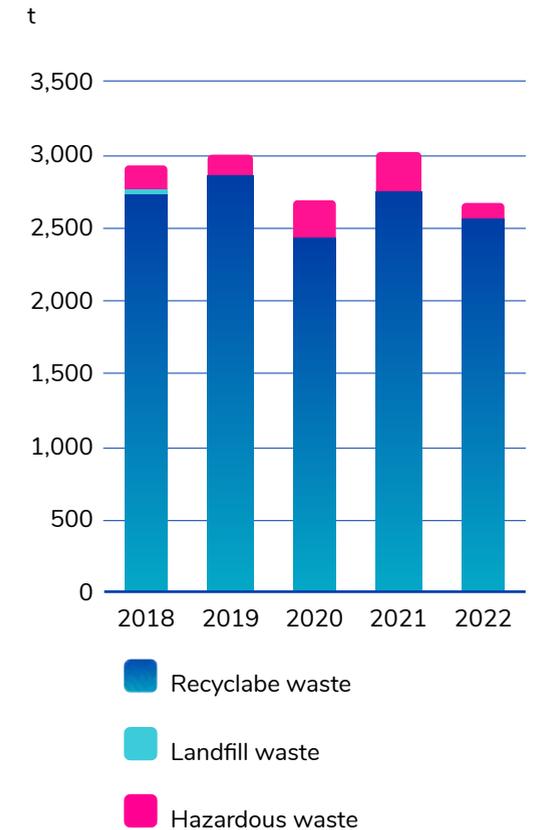
Protective equipment used in operating and maintaining the power plant,



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 (HMAJ) at Olkiluoto. It will reduce the amount of low-level waste placed in the VLJ repository.

Waste
Municipal waste



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 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%

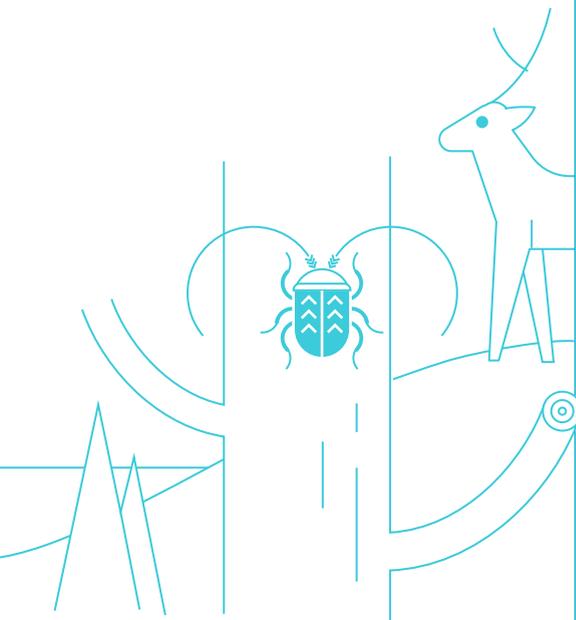
The share of waste reused as materials and energy of the total amount of waste.



Targets:

BIODIVERSITY

- » Efficient land use: share of produced electricity with respect to the surface area of built environment ca. 15 647 GWh/km² from 2023 onwards.
- » At least one voluntary project promoting biodiversity carried out annually.



Environmental research and biodiversity

The island of Olkiluoto is one 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.

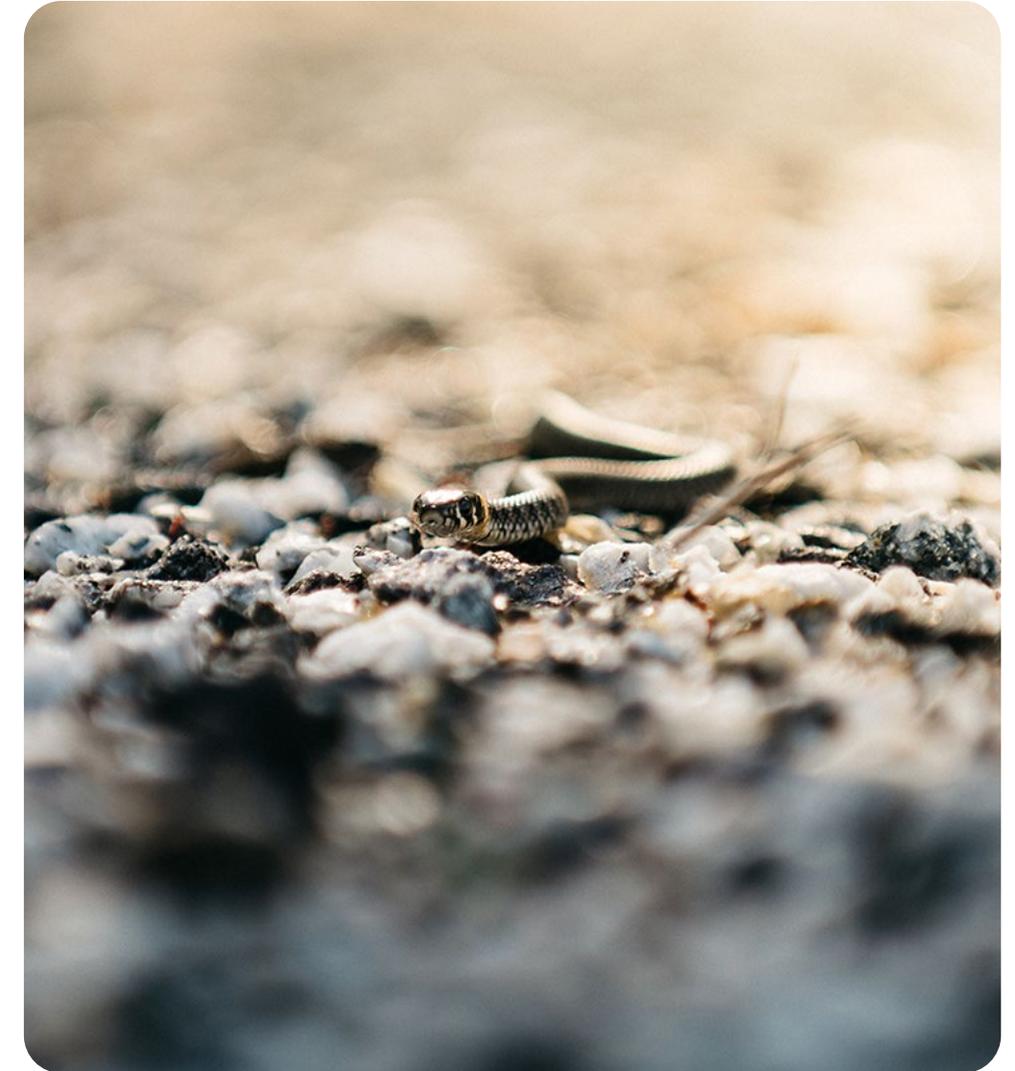
Over 100 water samples are taken each year from the sea area surrounding Olkiluoto. These samples are subjected to approximately 1,500 different water quality

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.

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.

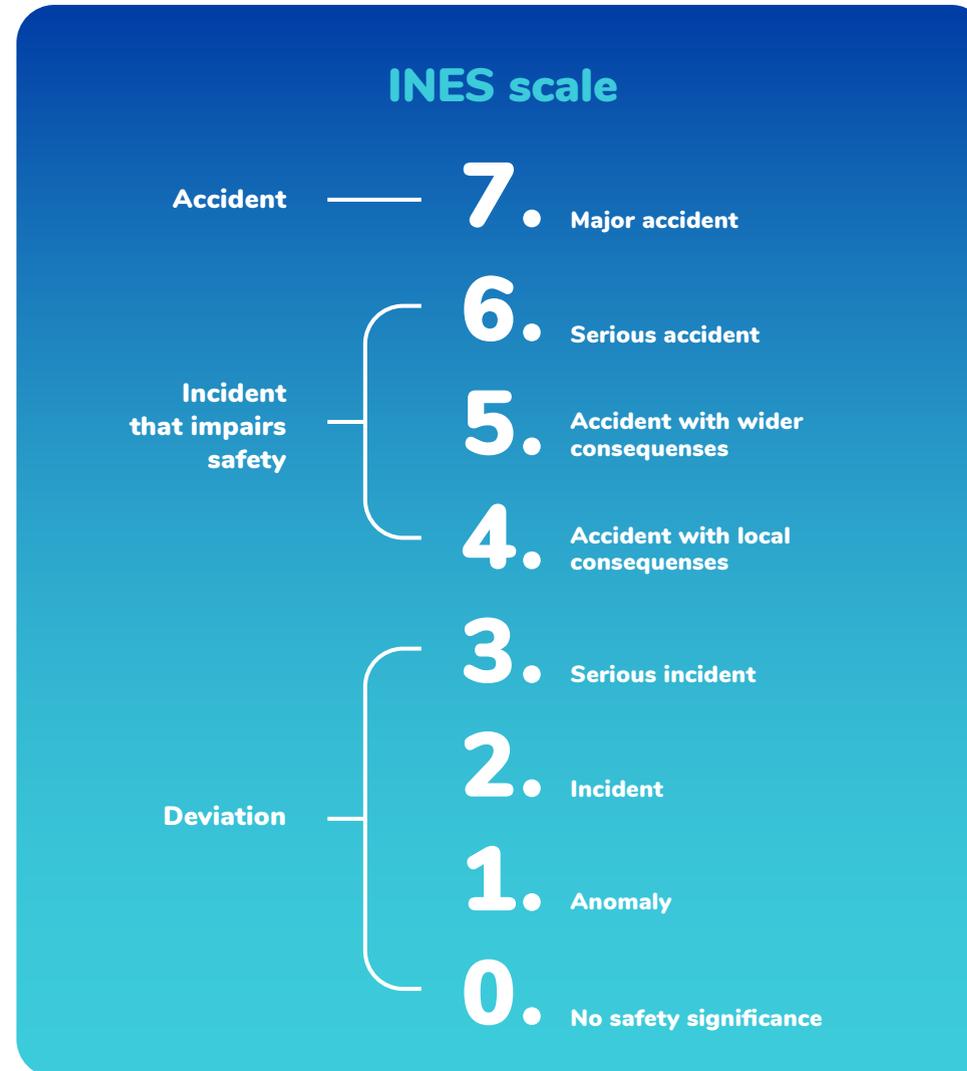
The competent environmental permit authority is the Southern Finland Regional State Administrative Agency, and the supervising authority is the Southwest Finland Centre for Economic Development, Transport and the Environment. Other authorities involved in the management of environmental matters include 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 (HMAJ) 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

- » Posiva's final disposal activities begin according to plan in the mid-2020s.
- » Final disposal is carried out on an industrial scale – about 400 tU spent fuel is disposed safely and according to cost estimates by 2030.

INCREASING FINAL DISPOSAL EXPERTISE

- » 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 (continual).

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

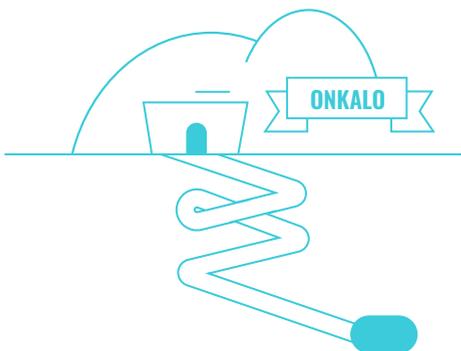
Spent nuclear fuel from the nuclear power plants of TVO and Fortum will be packed in copper canisters and placed in final disposal in the Olkiluoto bedrock at a depth of approximately 430 metres. Posiva manages the research into the final disposal of its owner companies' spent nuclear fuel, the construction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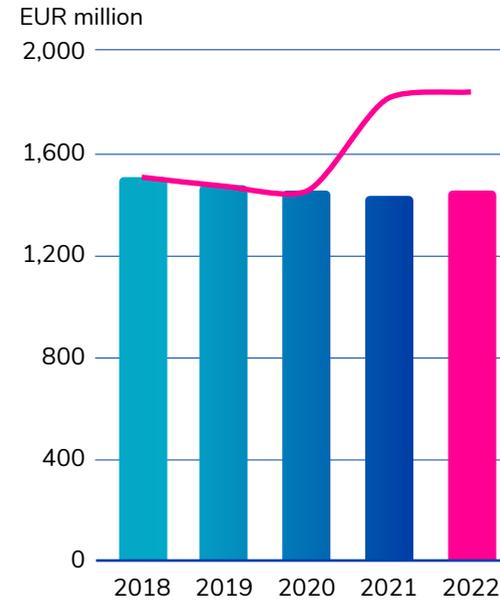
Advance collection of waste management funds

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 has 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](#)



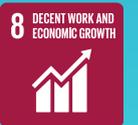
Particle-larly great jobs

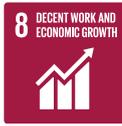
The TVO Group is a hub of Finnish nuclear power expertise. The Company's top-quality results are produced by skilled, professional, and experienced employees. The Group's approximately 1,000 employees have more than 200 different job titles.

The Group aims to guarantee good and safe working conditions for everyone. In accordance with its Code of Conduct, the Group does not tolerate discrimination or harassment based on age, gender, ethnic background, religion, life philosophy, opinion, or other personal characteristic.

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- 63 Occupational health and safety
- 65 Radiation safety
- 67 Social responsibility indicators





Targets:

EMPLOYER ROLE

- » Recruiting over 100 students for internships annually.



Personnel

The objective of the TVO Group is to have a healthy, equal working environment that tolerates no discrimination and that promotes the implementation of equality in practice.

The TVO Group's Code of Conduct and Group-level policies define the principles of the human resources policy. A prerequisite for the TVO Group's operations is that all of its employees remain motivated, carry out their duties in a responsible manner, and commit to the agreed processes.

The TVO Group offers its personnel varied duties and an opportunity for professional development. The Group offers competitive rewards and encourages employees to work profitably, to meet their goals, and to work to a high standard every day. The competence and expertise of the Group's employees are based on systematic development of professional competence and long employment relationships.

In 2022, activities were continued in the TVO Group to develop the work community culture and reinforce the safety culture. The Group carries out a personnel survey approximately every 18 months. The results of the survey, performed by Eezy Spirit Oy, were received in November



In 2022, activities were continued in the TVO Group to develop the work community culture and reinforce the safety culture."

2021. The next survey will take place in 2023. The response rate was 85 percent, and the People Power Index, which represents the overall result, was 68.7 (2020: 66.0). The result clearly increased from the previous survey, although the rating remained in category A (satisfactory).

87 new employees joined the Olkiluoto team to do a Particle-larly Great Job

A total of 87 new permanent employees were hired during 2022. At the end of 2022, TVO employed 1,005 people. The average number of employees during the year was 1,029. Most of TVO's employees work at Olkiluoto, with some 25 people working in Helsinki. The average age of TVO's employees was 43.3 years in 2022.

At the end of 2022, 21.7 percent of TVO's permanent employees were female. The

Board of Directors had ten members, two of them female. The Management Group had thirteen members, four of them female. The Management Group includes three personnel representatives. A total of 66 permanent employees left the Company, 16 of them due to retirement. Six percent of TVO's permanent employees took parental leave during the year.

TVO employed 99 summer trainees in 2022. As in previous years, TVO participated in the Responsible Summer Job campaign, which aims to improve the quality of summer jobs and the readiness of youth between the ages of 16 and 25 to begin their working careers. TVO also continued its cooperation with educational institutions in the local area. TVO participated in recruitment events arranged by institutes of higher education.

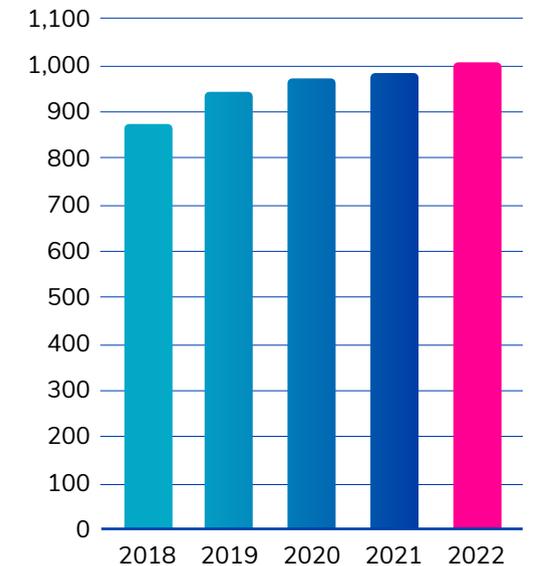
The personnel figures for the Group are summarised in the chapter "Social responsibility indicators" (p. 70).

The projects in Olkiluoto have a significant impact on employment

OL3 is a large international project procured as a fixed-price turnkey project from

TVO's personnel 31 December 2022

Personnel



a consortium (Plant Supplier) formed by Areva GmbH, Areva NP SAS, and Siemens AG. The Plant Supplier's average workforce at OL3 was 1,086 persons in 2022. A high level of safety culture is required from all parties working at OL3, and the occupational health and safety of the employees working at OL3 remained at a good level.

The annual outages of the OL1 and OL2 plant units employ some 150 sub-contractor companies from Finland and abroad. A total of approximately 850 external workers participated in the annual outages in 2022, approximately 660 of them Finnish. In addition to companies from Finland, subcontractors from 19 other countries participated in the effort. To ensure safe annual outages during the COVID-19 pandemic, TVO engaged in extensive cooperation with various authorities such as the Satakunta Hospital District and doctors of infectious diseases in the adjacent towns and municipalities. Safety measures were carried out in compliance with the general policies of the Finnish Government and the recommendations of the Finnish Institute for Health and Welfare (THL).

Preparedness for the COVID-19 pandemic continued

During the year, the TVO Group continued to prepare for potential COVID-19 contagions and executed various measures to prevent the spread of the virus on the Olkiluoto island. The extensive measures included reducing travel, remote working whenever possible, restricting visitors' access to the TVO Group's facilities, cancelling events, and moving training to digital environments. Access restrictions were introduced in the area to redistribute encounters to different areas and to reduce physical contacts. The staff canteens as well as cleaning operations

at all sites underwent major changes, and the employer made COVID-19 home tests available to the personnel. The effectiveness of the measures was deemed successful, since COVID-19 transmission chains were avoided in Olkiluoto.

The TVO Group lifted the extensive COVID-19 measures in summer 2022. The Group continuously assesses the epidemic situation, and the instructions and practices also follow the general policies and decisions of THL and the Finnish Government.

Fair and equal work community

The TVO Group complies with the applicable collective labour agreements for the energy sector in all its operations. The current agreements are valid until early 2023. All of the employees fall under the scope of the collective agreements. The TVO Group has freedom of association. The energy sector's agreed salary systems for technical and industrial salaried employees and regular employees are based on the job requirement categories and support the implementation of an equal salary policy. Regular and systematic evaluation on remuneration and salary systems is carried out by an independent third party. As a rule, the various employment benefits apply to the entire personnel, excluding very short employment relationships.

The TVO Group is committed to promoting equality and preventing discrimination

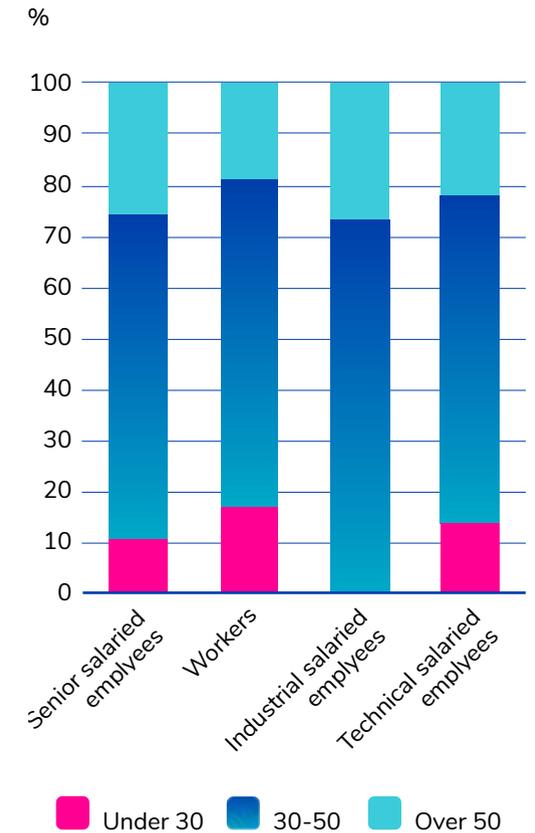


in all of its activities. The TVO Group employs an equality plan that discusses equality and separately presents those courses of action that the TVO Group uses to ensure the prevention of all forms of discrimination within its processes and, on the other hand, promotes the equal treatment of personnel.

The equality status of the workplace is evaluated continuously. The purpose of the evaluation is to keep up to date on how equal the working community within the TVO Group is considered to be, and which areas for improvement could possibly be found in relation to equality. HR performs the evaluation by utilising the personnel reports and key performance indicators that are also created for other needs (e.g. personnel survey, safety culture questionnaire, sustainability reporting, Code of Conduct) and the matter is discussed during the employer/employee cooperation meetings.

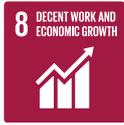
The themes of equality as well as the principles of leadership and working are discussed in the joint meetings of the Group's management and personnel representatives (employer/employee cooperation meetings, employment negotiations, the TVO Group's Management Group). Furthermore, their implementation is tracked in connection with the personnel surveys, for example. Any identified deficiencies and areas for improvement are rectified without delay.

TVO's personnel by age group
31 December 2022 ¹⁾



¹⁾ Data reported only for permanent personnel

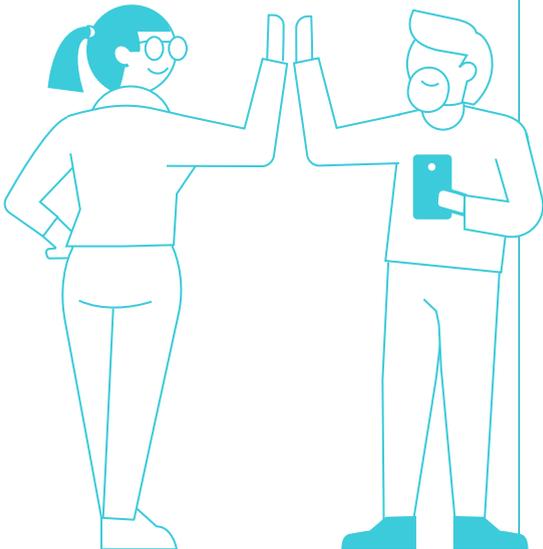
“The TVO Group is committed to promoting equality and preventing discrimination in all of its activities.”



Targets:

OCCUPATIONAL HEALTH

- » Personnel survey (People Power Index) result at level AA (good) achieved by 2025.
- » Sick leaves (% of working time) below 3% annually.
- » Employees' pension insurance (TyEL) category below 4 (continual).



Occupational well-being

The Better Workplace Programme develops the TVO Group's management and operating culture.

The goals of the Better Workplace Programme include boosting the efficiency of operations and ensuring good operational preconditions by developing issues pertaining to the employees' own work, their immediate work community, and the entire Group. Several development efforts are defined annually for the purpose of meeting the goals, and their progress is tracked by the Better Workplace Group. The group consists of representatives of the Management Group and personnel. The Better Workplace Group convened nine times during 2022.

The 2022 themes of Better Workplace were:

- » **“Working together”**, which covered, among other things, building the TVO Group's guidelines for a new model of working, increasing collaboration between the different organisational units, and involving the personnel in the strategy process.
- » **“Smooth everyday work”**, which included examining the key decision-making forums and considering the modification of meeting practices and meeting culture as well as the use of new digital tools as part of a new way of working.

In 2022, Better Workplace continued with measures that focused on themes selected on the basis of the 2021 personnel survey results. Implementation of suggestions for improvements that were received from the field also continued. Goals included promoting the concrete development actions, streamlining practices, and communicating about these. The development efforts will continue in 2023, focusing on themes selected on the basis of the personnel survey and the feedback received from the field.

Occupational well-being is something to take care of

Key actions related to the maintenance and development of occupational well-being in 2022 involved establishing new ways of working, enabling safe work during the COVID-19 pandemic that still continued, and activities organised together with occupational healthcare services. During the course of the year, webinars were arranged for all personnel concerning coping with the crisis period and the significance of nourishment in terms of alertness at work and recovery. Moreover, in the autumn, the Company started the voluntary 12-week well-being coaching titled “Liikkuva OlkiJengi” that promoted a sense of community and physical activity.



Close cooperation with occupational healthcare services has continued. The Group uses an early support model as well as models for substitutive and lighter work. Occupational healthcare services focus especially on supporting the proactive management and maintenance of working capacity and risk-based working capacity analyses. Videos on work ergonomics have been produced for the personnel together with occupational health care. Furthermore, the personnel has access to a low threshold online mental health service. All TVO Group employees are covered by occupational health care. Subcontracting companies are responsible for the occupational health care of their own employees.

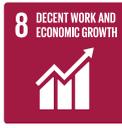
Well-being at work is promoted by the comprehensive occupational healthcare services available to all of the Group's employees and the supplementary insurance coverage. In addition to the full-time group accident insurance, the personnel have travel insurance and medical expense insurance. The employees' ability to reconcile work and leisure is supported by using flexitime and a sabbatical leave system. Furthermore, the Company uses a working time account system. The pilot project has been continued in line with a flexiwork model according to the new Finnish Working Time Act, which became effective at the start of 2020. The working time account system and the flexiwork pilot cover senior salaried employees who are included in the scope of the total compensation system.



Employees of the TVO Group have access to the Smartum exercise and culture benefit with the massage service option, through which the employer supports the employees voluntarily maintaining their own working capacity. Due to the COVID-19 pandemic, only a few communal events promoting occupational well-being could be arranged towards the end of the year. The employees are encouraged to also uphold the sense of community virtually. In addition, the employees have access to several holiday locations.

Navigation discussions as part of interaction and development

The employees' performance, workload, and coping at work are monitored through navigation discussions with their immediate supervisor, arranged three times a year. The focus in management and supervisory work has been shifted from the monitoring of working hours towards the management of performance. This practice allows for more flexible ways of working, such as remote working, for all employees whose job description allows it. During the navigation discussions, all employees can talk with their supervisor about improvements concerning the operations of the Company, their immediate work community or their own work, as well as aspects relating to salary.



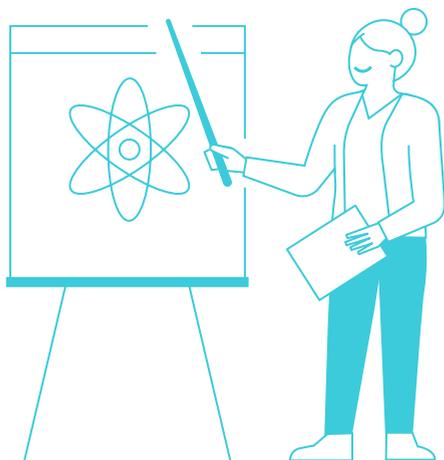
Targets:

HIGH-CLASS EXPERTISE

- » Actualisation rate of competence surveying over 90% annually.
- » Inspection rate of individual training plans over 90% annually.

PROFESSIONAL DEVELOPMENT

- » Employees' changes in position over 10% annually.
- » Actualisation rate of navigation discussions over 90% annually.



Competence development

Systematic and long-term competence management measures support the safe operation of the nuclear power plant.

In the nuclear industry, the maintenance and development of employees' competence is essential in terms of the company's operations. A high level of competence can be reached, for example, through well-planned induction, job guidance, mentoring, coaching, competence mapping, job rotation, and targeted training requirements. High standards of quality, long-term planning, and a proactive approach are the key characteristics of personnel development.

The TVO Group's competence management ensures and maintains the qualification and ability of everyone working at Olkiluoto according to each position's requirements.

An individual training plan is prepared for each employee of TVO and separately specified external workers. The plan is used to track the completion of the training required to reach full qualifications and to plan any further training that is needed. The individual training plan compiles together the training

requirements coming from the Group level, functions, permits, or special roles. The plan is discussed annually during navigation discussions.

Annual training programme allows for the systematic development of competence

As in previous years, the basic training, refresher training, and supplementary training for the Group's personnel were arranged according to the annual training programme. The purpose of the annual training programme is maintaining and developing competencies in a planned, centralised manner and with the smart use of resources. The programme considers the training topics separately observed in the organisation in addition to the needs originating from individual training plans.

The annual training programme is divided into technical trainings related to the nuclear facility's operations and trainings that support the operations, such as emergency preparedness and protection trainings and separate administrative trainings. The annual training programme covered a total of 484 topics, and the programme was mainly implemented according to plan. The personnel received a total of 11,680 days



of training, equalling on average 11.6 days per TVO employee. The Group's own expert instructors and separately defined external parties were utilised in the trainings offered to the personnel.

The competence development projects in 2022 focused on the creation of more detailed role-specific competence analyses, the unification of separate e-learning environments, the reform of the competence management data system, and the further development of the reporting related to the trainings. Furthermore, multimodal learning methods were utilised more comprehensively, with classroom and online trainings incorporating elements such as animations, games, virtual reality, and an escape room for engagement purposes. The purpose of multimodal learning methods is to motivate and engage students and to make the training content more interesting to them.

Comprehensive induction is part of a good safety culture. Induction is supported by the initial and further induction forms defined at the Group level as well as by job-specific professional induction plans or job guidance plans. Supporting functions related to induction were continued, among other things, by means of induction review discussions that are held with new employees as well as employees switching tasks in order to assess the functionality of the induction process.

The main goal of operations training at OL1, OL2, and OL3 was the implementation of high-quality training on the simulator and in the classrooms in accordance with the annual training programme. The future plant modifications comprised one of the focus areas. The goals were reached as planned.

Diverse competence makes the organisation's operations stronger

The operating personnel of the nuclear power plant receive comprehensive training throughout their careers. In 2022, operators of OL1, OL2, and OL3 participated in operating training events and advanced simulator courses in the spring and autumn as required by their refresher training programme. The OL3 operators worked in shifts in the operating organisation jointly established by the Plant Supplier and TVO, carrying out system operating and monitoring tasks.

The Nuclear Professional Leader (NPL) training programme, initiated in 2021 to develop supervisor skills, was continued. The aim of the programme is to prepare supervisors for their tasks within the nuclear industry in more comprehensive ways than before.

All employees working in the Olkiluoto nuclear power plant area must attend introductory training. The general section of the introductory training is

intended for everyone working in the Olkiluoto area, while the radiation section is intended for those operating in the radiation controlled area. In 2022, a total of 2,212 (3,011) people completed the general section of introductory training, and 1,201 (1,454) people completed the radiation protection section (reported on 13 Jan 2023). Both training sections were provided in Finnish and English. The refreshers of all the sections are available in Finnish and English in the internal and external e-learning environments.

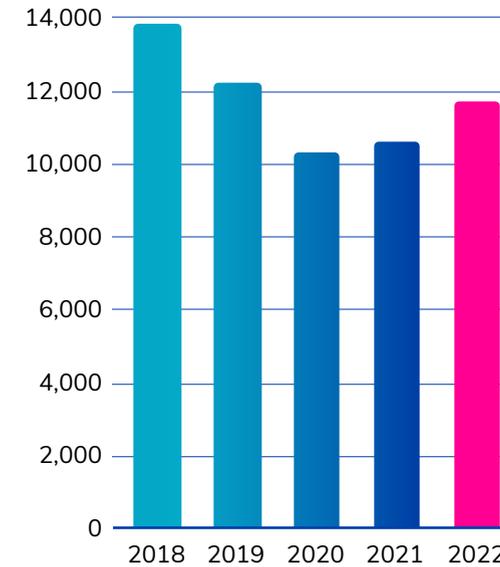
The competence of the persons participating in annual outages was developed by means of online annual outage training, which was also a prerequisite for an access pass. The purpose of the training was to ensure that the employees of the Group and the external annual outage personnel are well aware of the TVO Group's requirements concerning high-quality work performance and safe ways of working. A total of 937 TVO Group employees and 1,763 members of the external workforce, of which 52 were representatives of the authorities, completed the online annual outage training course. The total number of participants was 2,700. The annual outage competence was further supported by other trainings and events designed for annual outage induction.

A training package similar to the annual outage training of the OL1 and OL2 plant units was provided for OL3. The

Training days

Total

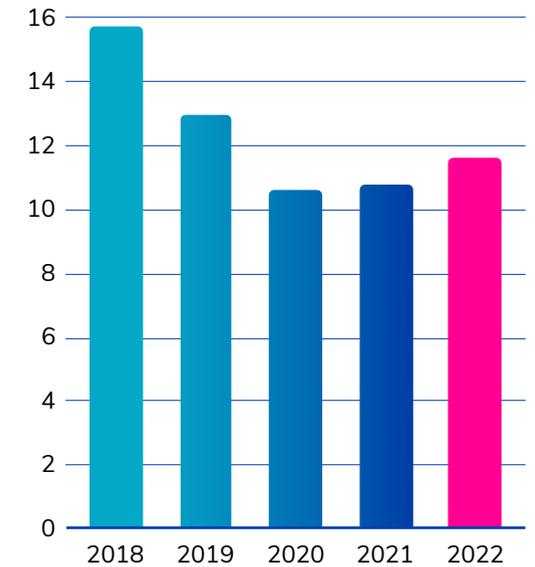
Days



Training days

/person

Days



purpose of this training was to reinforce the expectations related to high-quality work performance. A total of 214 Group employees and 319 members of the external workforce completed the online training for the theory part. During 2022, the mock-up section was completed by 258 persons. The training package must be completed before an access permit to OL3 indoor facilities can be granted. Late in the year, the mock-up section was merged with the theory section.

Occupational health and safety training is a normal part of the Group's annual training programme. General occupational safety training is provided starting from TVO's introductory training, which also includes occupational safety-related working methods and expectations that have been identified as important for the nuclear energy industry. The annual training programme includes regular first aid training that also covers the treatment of electricity-related injuries.

Other training courses that relate to occupational health and safety risks identified at TVO include training for work in closed and confined spaces, training for man-hole guard duty, hot work card training, and training for lifting and the use of fall protection equipment. Training courses related to electrical safety include a basic course for people with no training in electrical engineering who require access to electrical facilities and the SFS 6002 safety training that is compulsory for electrical engineering professionals working in Finland. ATEX training is targeted at people who work in explosive spaces or design such facilities and equipment.

Occupational health and safety training courses provided information about the occupational health and safety management system and the management system for risks related to work and the environment. Thematic training events on various issues are held each year to promote employee well-being at work.

Close collaboration with educational institutions and other actors in the field

The TVO Group engages in many levels of cooperation with educational institutions and students. The TVO Group is aware of its role as a future employer of new nuclear sector experts, and strives to do its part in ensuring the availability of the needed competence. In 2022, educational institution collaboration was deepened



with several operators. Among other things, this aims at creating closer ties between the Company and students and offering students diverse thesis opportunities and trainee positions.

The TVO Group participates in the implementation of a national nuclear safety and waste management training course together with other major Finnish operators in the nuclear industry. Such training courses give students a holistic understanding of the nuclear industry and its central operating models. The training

consists of six periods that contain key matters related to nuclear power plants and nuclear waste management.

In 2022, TVO participated in the Nordic Nuclear Trainee Programme alongside Fortum and Swedish nuclear power companies. The purpose of the training is to raise the students' interest towards the nuclear industry as an employer and to help them see the opportunities nuclear power can offer in the future. The training includes eight modules that are implemented in Finland and Sweden.



HR Partner Johannes Kangasniemi:

"The nuclear industry needs experts from many fields"

Labour shortage or skill shortage. These are two very current and familiar terms from the news in recent years. The topics have not remained foreign even in Olkiluoto, since the nuclear industry is extremely skill-oriented. TVO has investigated both finding and retaining talent in several ways.



Johannes Kangasniemi is very familiar with the topic related to experts. He works at TVO as an HR Partner of the Technology function and is also responsible for developing the Group's recruitment process and cooperation with educational institutions.

– We are not safe from the skill shortage even here, but this global and local phenomenon is equally a challenge for us as well, he begins and assesses that Olkiluoto's location outside the strongest growth centres brings its own additional challenges into the equation.

According to Kangasniemi, TVO looks for new talent on a wide scale.

– We have several recruitment partners and channels, he says. Cooperation with educational institutions is at the very centre.

– Internships, theses, visiting lectures, and educational institution visits, the HR Partner lists. Twenty theses are done in the TVO Group every year. New measures include, for example, our own automation technology sponsorship class and our own training path for expert positions.

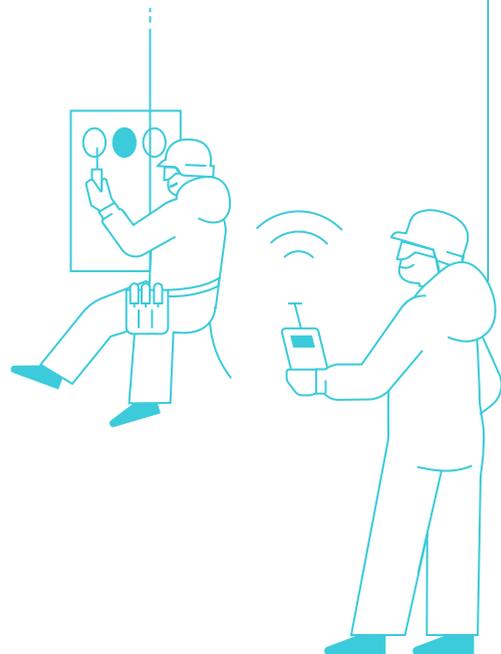
Read the full interview on [TVO's website](#)



Targets:

OCCUPATIONAL HEALTH AND SAFETY

- » No serious accidents in the TVO Group, including contractors (continual).
- » The TVO Group's accident frequency (accidents per one million working hours) below 1, including contractors, by 2030.



Occupational health and safety

The TVO Group's goals are to guarantee its employees, contractors, and service providers a safe workplace and operating environment, as well as to verify that standardised operating methods are used in the Group's operating area.

The occupational health and safety operations are guided by an ISO 45001 certified occupational health and safety system (OHS system). The system also covers TVO's area of responsibility for the construction phase of the OL3 plant unit.

The mission of the OHS organisation is to be an expert organisation that supports, coaches, monitors, and develops occupational health and safety operations and helps the line organisation and the contractors succeed in this area. The contractors working for the TVO Group at Olkiluoto are responsible operators who work in accordance with the Group's expectations and comply with shared operating models. This ensures that Group employees, partners, and contractors can work safely at Olkiluoto, without the work impacting their health. The most important safety objectives for 2022 were clarifying the OHS responsibilities of the line organisation, supporting supervisors in their work, strengthening contractor cooperation, and

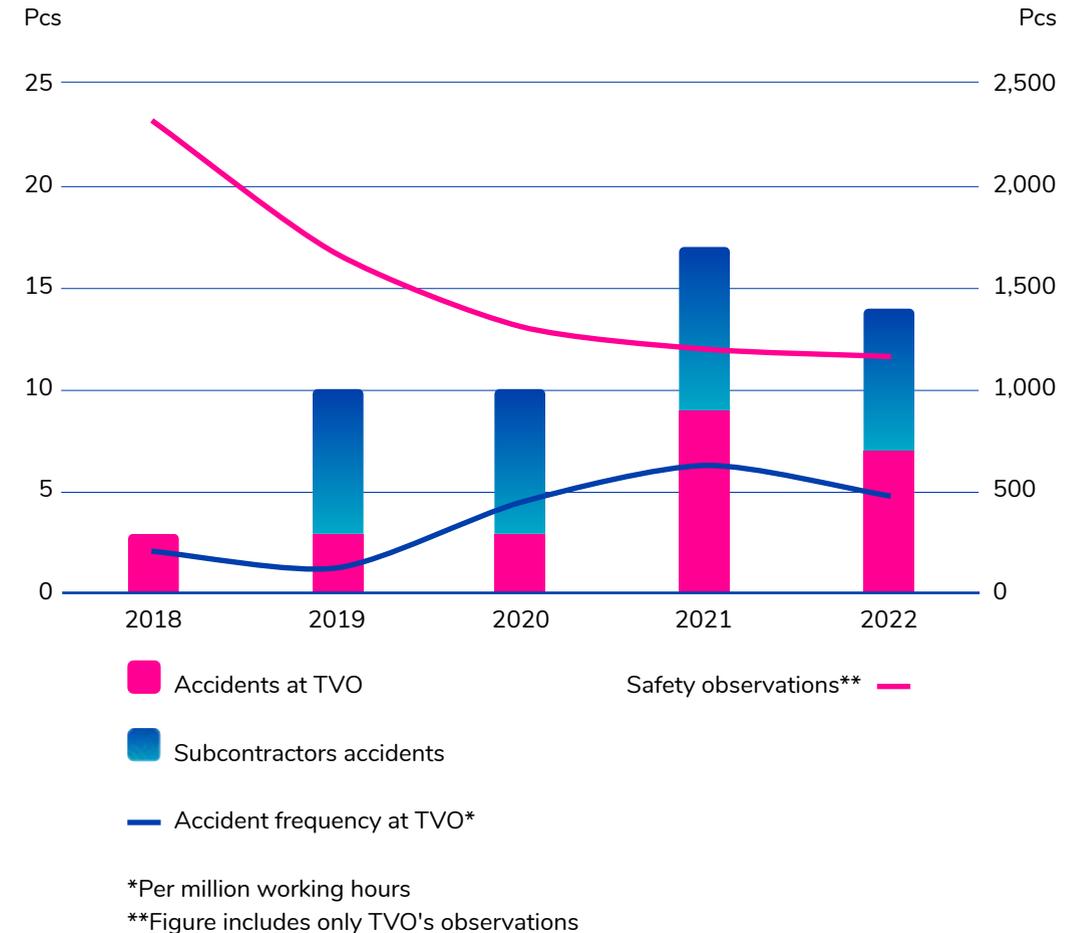
developing the processes for identifying hazards and managing risks so that they also cover the psychosocial risk factors.

The occupational health and safety policy is included in the Group-level policies under corporate social responsibility. Starting points for the occupational health and safety policy are zero accidents, maintenance of a good atmosphere and working conditions, and zero tolerance in terms of workplace harassment or bullying. Each person is to look after the safety of oneself and others. When making decisions about occupational safety, the Group is committed to hearing the employees and any employee representatives, as well as to ensuring their inclusion. According to the zero accidents principle, all accidents can be avoided by carefully planning the work, identifying hazards in a proactive manner, and adhering to strict quality standards.

Cooperation in OHS across organisational borders

The occupational safety activities are coordinated by OHS experts from the Occupational and Environmental Safety Competence Centre. Furthermore, personnel groups (regular employees and salaried employees) have named

Accidents and safety observations



*Per million working hours

**Figure includes only TVO's observations

occupational safety delegates and deputy delegates from amongst themselves. There is an Olkiluoto OHS team consisting of OHS experts, occupational safety delegates, representatives of the different business functions and units and representatives of occupational healthcare services. The team is comprehensive and it has been confirmed to represent the entire personnel. The purpose of the team is to strengthen the communication between the OHS personnel and the line organisation and to support the development of occupational health and safety activities.

Reports on the functionality of the OHS system and the required corrective measures are submitted to the management twice a year in connection with management reviews. Annually set occupational safety targets support the development of the operations. The management performs safety walkdowns that focus on different safety-related topics. Observations made during the walkdowns are entered in the electronic quality management data system for further actions. The Company's Board of Directors also monitors the developments in occupational safety.

The TVO Group's goal for accident frequency in 2022 was 1.6 (accidents per one million work-hours). The accident frequency considers TVO's personnel, Posiva's personnel, and all subcontractors working at Olkiluoto, with the exception of the OL3 area that is reported by the Areva-Siemens plant supplier consortium.

In 2022, the accident frequency for the TVO Group was 4.8 accidents per one million work-hours. During the course of the year, TVO's employees had seven lost-time accidents. The accident frequency for TVO personnel was 4.2. TVO personnel had a total of 22 absence days due to accidents. Nine commuting accidents took place during the year, two of them leading to absence. All the lost-time accidents were investigated and corrective actions were specified to prevent recurrence. A total of seven lost-time accidents happened to TVO's subcontractors at Olkiluoto and the accident frequency was 5.6 accidents per one million work-hours. No serious accidents (leading to more than 30 days of absence) happened to TVO's personnel or TVO's subcontractors in 2022.

The management of the Group has specified goals for 2023 in connection with its strategy planning. Occupational safety is included in the strategic planning for safety. The company-level goal has been set as decreasing the combined accident frequency at Olkiluoto to 3.5 or fewer accidents per one million work-hours.

Identification of hazards, risk assessment, and accident investigations help prevent future accidents

Identification of hazards and assessment of occupational safety risks is carried out



systematically. Proactive identification reveals the main hazards that employees may face at the workplace. As a result, the hazards can be eliminated or assessed and prioritised, and risks resulting from them can be reduced. In addition to task-specific risk assessments, the TVO Group utilises the booklet "Hazard identification on site". The form in the booklet includes the most common hazards that need to be checked before starting the work in order to ensure its safe completion. At the work site, the working team must go through a hazard identification

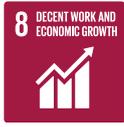
and ensure that there is no danger, or that it is under control so that the danger does not cause the risk of an accident. If any risk is detected at the work site that can cause danger during the execution of the work, corrective measures must be taken to eliminate or reduce the risk before starting the work. The assessment of psychosocial risks has been furthered as part of the OHS Development Programme.

Risk assessment is particularly important for high-risk tasks. At the TVO Group, these include working at heights

and close to openings, electrical work, demanding lifting work, and working in closed and confined spaces. The personnel receive risk assessment training, and OHS specialists are involved in the assessment process. Safety observations are another important part of continuous development of operations. Observations can also be submitted anonymously. The number of safety observations surpassed the target in 2022.

Reporting observed hazardous situations helps in preventing accidents. The investigation of hazardous situations and the implementation of corrective actions aim to prevent recurrence of the events. In 2022, slipping, tripping, and other accidents related to movement, as well as various strikes from objects and hand injuries were the most common accident types in the areas managed by the TVO Group. A positive feature was the low threshold in reporting events.

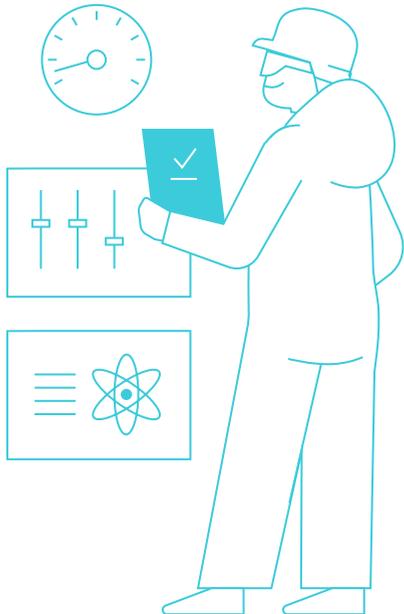
The unit manager of the injured employee initiates the accident investigation together with the occupational safety organisation. Accident investigations are reported to the line management, which processes them in its own organisations and ensures that corrective actions are implemented. The progress of corrective measures is followed on the Kelpo observation platform. The safety level of all active construction sites is monitored by means of weekly safety measuring rounds.



Targets:

RADIATION PROTECTION

- » Individual radiation doses incurred in Olkiluoto below half of authority limit (continual).



Radiation safety

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

Limiting the doses and keeping the level of radioactive releases as low as possible are already taken into account when designing the plant structures and functions. Each employee must take radiation protection issues into account in their own work. In addition to authority guidelines, the development of radiation protection operations also takes international recommendations into account.

The radiation doses of everyone working in the radiation controlled area of the nuclear power plant are monitored and measured using dosimeters. According to Section 13 of the Government Decree on Ionizing Radiation, the effective dose of a radiation worker must not exceed 20 millisieverts per year. The TVO Group's own targets regarding individual annual doses are keeping the dose obtained by all Olkiluoto employees from their work below 10 mSv per year and keeping doses

caused by internal contamination below 0.5 mSv. These targets have been reached.

Radiation exposure below dose limits

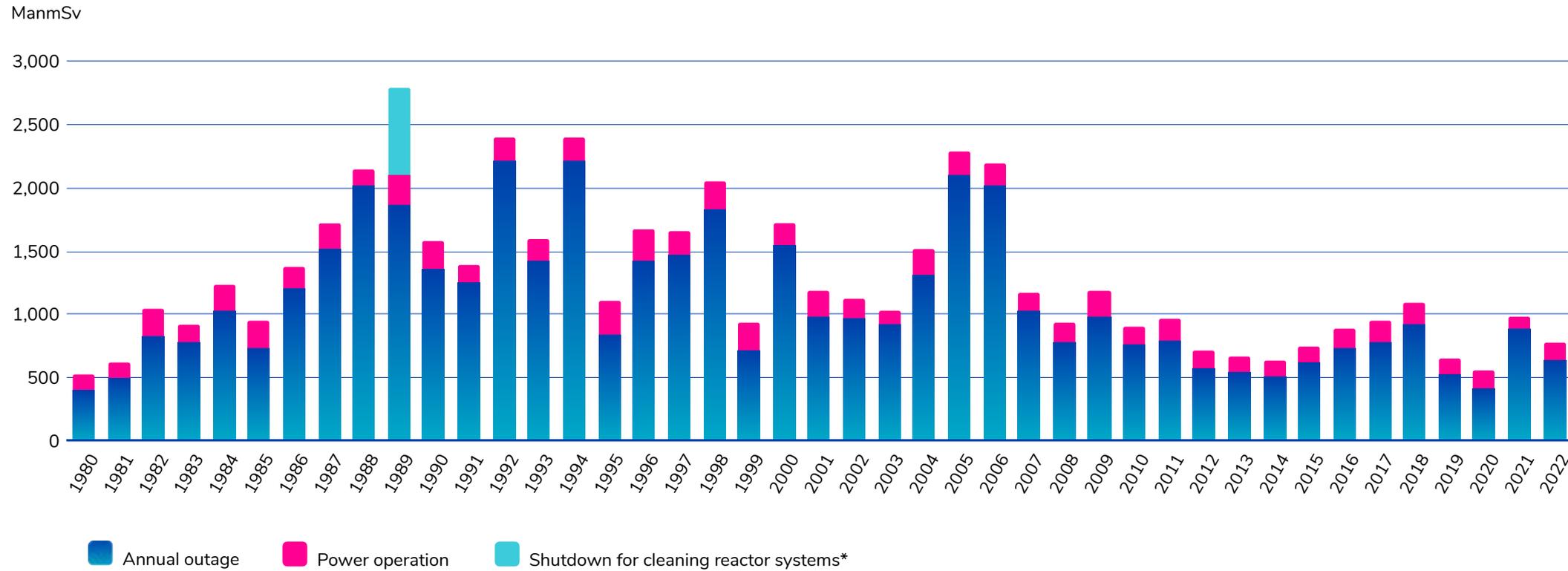
The radiation exposure of employees at Olkiluoto has been low, remaining clearly below the dose limits specified by the authorities. In 2022, the total dose of employees subject to radiation exposure at Olkiluoto was 789 manmSv. A total dose of 647 manmSv was accumulated during the power plant's annual outages. Over the course of the year, the commissioning activities of the OL3 plant unit led to a dose of 4.1 manmSv.

The combined annual dose of TVO personnel was 183 manmSv (2021: 233), and that of external personnel was 607 manmSv (2021: 751). The highest individual annual dose incurred at the Olkiluoto nuclear power plant was 6.5 mSv. The number of personnel under dose monitoring was 3,661 (2021: 4,008), with recorded doses accumulated by 895 (2021: 950) employees. The average annual radiation dose received from radiation sources in the environment by a person living in Finland is approximately 5.9 mSv¹.

Note 1. Average effective dose of people living in Finland in 2018, STUK-A263 / April 2020, T. Siiskonen (Ed.), ISBN 978-952-309-446-8



Annual radiation doses at OL1 and OL2



* In 1989, metal particles that had been inside a valve in the OL1 plant unit since its construction started to move and ended up in the reactor, preventing the upwards motion of the control rods. This caused the longest extra shutdown in the history of TVO.



The radiation exposure of employees in Olkiluoto has remained clearly below authority limits.”

Social responsibility indicators

Personnel

Personnel structure	2022	2021	2020	2019	2018
Number of employees, permanent, 31 Dec	984	963	954	922	862
Male	770	749	743	722	679
Female	214	214	211	200	183
Number of employees, fixed-term, 31 Dec	21	19	19	19	15
Male	15	12	11	13	10
Female	6	7	8	6	5
Number of employees, part-time, 31 Dec ¹⁾	19	13	18	20	18
Male	7	2	4	4	6
Female	12	11	14	16	12
Average age of employees ²⁾	43.3	43.2	42.7	42.6	42.7
Male	43.5	43.6	43.2	43.1	43.2
Female	42.2	41.6	41.2	40.8	40.7
Employees' place of residence (%) ²⁾					
Eurajoki	16	17	18	17	18
Rauma	49	49	48	48	50
Pori	18	18	17	17	15
Other	17	16	17	18	17
New employees ²⁾	87	70	77	116	134
Male	70	52	55	87	102
Female	17	18	22	29	31

Personnel structure	2022	2021	2020	2019	2018
Average age of new employees ²⁾	34.5	34.0	35.9	35.7	34.8
Male	34.6	33.8	34.6	35.8	35.3
Female	34.0	34.6	39.3	35.1	33.3
Average number of years of employment ²⁾	11	11	10	10	11
Incoming turnover (%) ²⁾	8.8	7.3	8.1	12.6	15.5
Outgoing turnover (%) ²⁾	6.7	6.3	4.7	6.1	6.4*
Number of retirees ²⁾	16	5	11	13	9
Average age of retirees ²⁾	65.1	64.6	63.9	64.1	63.8
Summer employees	99	84	87	107	105
Male	67	56	65	79	78
Female	32	28	22	28	27
Non-guaranteed hours employees, 31 Dec	0	-	-	-	-
Board of Directors by age (%)					
Less than 30 yrs	0	0	0	0	0
30-50 yrs	10	10	20	20	40
More than 50 yrs	90	90	80	80	60
Management Group by age (%)					
Less than 30 yrs	0	0	0	0	0
30-50 yrs	38	31	15	8	23
More than 50 yrs	62	69	85	92	77

¹⁾ The Group employees primarily work full time.

²⁾ Data reported only for permanent employees.

* The figure includes 12 employees who were transferred to TVO due to a business transfer.

Personnel groups by gender, 31 Dec ¹⁾	Female	Male	Total
Senior salaried employees	166 (27%)	447 (73%)	613
Regular employees	2 (1%)	186 (99%)	188
Industrial salaried employees	23 (88%)	3 (12%)	26
Technical salaried employees	23 (15%)	134 (85%)	157

¹⁾ Data reported only for permanent employees.

Personnel groups by age, 31 Dec ¹⁾	Total	Under 30 yrs	30–50 yrs	Over 50 yrs
Senior salaried employees	613	64 (11%)	387 (63%)	162 (26%)
Regular employees	188	32 (17%)	121 (64%)	35 (19%)
Industrial salaried employees	26	0 (0%)	19 (73%)	7 (27%)
Technical salaried employees	157	21 (13%)	102 (65%)	34 (22%)

¹⁾ Data reported only for permanent employees.

Permanent personnel hired in 2022 by age group	Male	Female	Total
Under 30 yrs	32	3	35
30-50 yrs	33	14	47
Over 50 yrs	5	0	5

Permanent personnel who left in 2022 by age group and gender	Male	Female	Total
Under 30 yrs	5	1	6
30-50 yrs	23	14	37
Over 50 yrs	21	2	23

Employment period of employees who left TVO in 2022 by age group and gender	Male	Female	Total ¹⁾
Under 30 yrs	3	2	3
30-50 yrs	5	5	5
Over 50 yrs	34	22	33
Total, on average	17	7	14

¹⁾ Total, on average

Well-being at work

Occupational health and safety indicators	2022	2021	2020	2019	2018
Sick leaves (%)	3.8	2.4	2.3	2.6	3.1
Male	3.7	2.3	2.1	2.5	2.9
Female	4.1	2.6	3.0	3.1	3.6
Sick leaves (hours/person)	68	43	43	47	55
Persons with zero absentee rate ¹⁾	153	401	394	309	238
Male	122	320	326	254	192
Female	31	81	68	55	46
Occupational disease rate	0	0	0	0	0
Health percentage (%)	11.0	41	40	31.8	27
Proportion of preventive occupational health care and medical care of total costs (%)	45.0	43.0	46	54.0	68
Proportion of medical care of total costs (%)	37.0	34	44	24	23.1

¹⁾ Data reported only for permanent employees.



Competence development

Competence indicators	2022	2021	2020	2019	2018
Training days/person	11.6	10.8	10.6	13.0	15.7
Training days total	11,680	10,608	10 342	12,249	13,813
Male	9,498	8,538	8 604	10,210	11,946
Female	2,182	2,070	1 738	2,038	1,866
Training days (average)					
Senior salaried employees (10.4 days/person)	6,345	5,062	5 224	6,558	7,157
Technical salaried employees (21.1 days/person)	3,422	2,970	3 269	2,744	4,030
Industrial salaried employees (2.7 days/person)	69	88	55	105	121
Regular employees (7.8 days/person)	1,480	1,484	1 373	2,495	2,064
Fixed-term and others (8.3 days/person)	364	1,003	421	347	440
Introduction training – general part (in Finnish)					
Number of attendees	1,647 ¹⁾	2,118	2 471	2,077	2,034
Online refresher course	-	1,258	1 746	1,323	1,113
Introduction training – general part (in English)					
Number of attendees	565 ¹⁾	893	1 056	1,116	1,551
Online refresher course	-	533	656	551	454
Introduction training – radiation part (in Finnish)					
Number of attendees	970	990	980	1,234	1,202
Online refresher course	788	763	810	736	655
Introduction training – radiation part (in English)					
Number of attendees	231	464	634	473	499
Online refresher course	192	177	285	88	42
Number of persons who completed occupational safety card training ²⁾	-	-	-	287	398

¹⁾ The refresher course is included in the number of attendees.

²⁾ The occupational safety card is no longer required. The topic is included in the induction training.

Occupational health and safety

Occupational health and safety indicators	2022	2021	2020	2019	2018
Working hours (incl. TVO) ¹⁾	1,649,778	1,642,227	1,628,034		
Working hours (incl. TVO's subcontractors) ¹⁾	1,261,237	1,367,618	1,123,432		
TVO employee accidents					
Absences, more than one day	7	9	3	3	3
Male	6	5	2	3	3
Female	1	4	1	0	0
Absences due to occupational accidents (days)	22	91	7	29	81
Male	19	78	2	29	81
Female	3	13	5	0	0
Accident frequency (accidents per one million working hours)	4.2	5.5	1.8	1.28	2.1
Male	4.7	4.0	1.6	1.9	2.7
Female	2.8	10.6	2.8	0	0
Lost day rate (per 100 employees)	2.7	11.1	0.9	4	11.2
Zero accidents, no absence	17	10	7	18	16
Male	11	6	2	13	11
Female	6	4	5	5	5
Commuting accidents	9	7	7	18	2
Male	4	5	5	14	1
Female	5	2	2	4	1
Number of safety observations ²⁾	1,163	1,199	1 309	1,666	2,319
Work-related fatalities (incl. TVO employees and subcontractors)	0	0	0	0	0
TVO subcontractor accidents					
Absence of more than one day (LTA1)	7	8	7	7	6

¹⁾ Reported as of 2020.

²⁾ The number includes only TVO's observations.

Group-level indicators

	2022	2021
Number of employees, permanent, 31 Dec ¹⁾	1,071	1,044
Male	837	810
Female	234	234
Number of employees, fixed-term, 31 Dec ¹⁾	26	33
Male	20	20
Female	6	13
Number of employees, part-time, 31 Dec ^{1) 2)}	20	15
Male	8	3
Female	12	12
Incoming turnover (%) ^{1) 3)}	8.9	6.8
Outgoing turnover (%) ^{1) 3)}	6.3	5.8
Summer employees ¹⁾	106	91
Male	71	61
Female	35	30
Non-guaranteed hours employees, 31 Dec ¹⁾	0	-
Sick leaves (%), TVO	3.8	2.4
Male	3.7	2.3
Female	4.1	2.6
Sick leaves (%), Posiva	1.9	1.3
Male	1.9	1.3
Female	2.0	1.3
Accident frequency (accidents per one million working hours) ⁴⁾	4.8	6.3

¹⁾ Data includes Posiva's and PSOY's employees.

²⁾ The Group employees primarily work full time.

³⁾ Data reported only for permanent employees.

⁴⁾ The accident frequency considers TVO's personnel, Posiva's personnel and all subcontractors working at Olkiluoto, with the exception of the OL3 area that is reported by the Areva-Siemens plant supplier consortium.

Radiation safety

Radiation safety indicators	2022	2021	2020	2019	2018
Highest radiation dose of personnel (mSv) ¹⁾	6.5	8.1	7.8	7.5	9.5
Collective radiation dose (manmSv)	789	984	565	647	1,101
Annual outage dose (manmSv)	647	884	413	530	918

¹⁾ The maximum permissible radiation dose is 20 mSv/year.



Creation of added economic value

At the TVO Group, shareholder value is created through customer-oriented and competitive operations. TVO is owned by five shareholders, through which the 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.

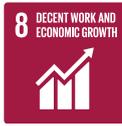
The TVO Group is a major employer and provider of economic well-being in Finland and the local region, both directly and indirectly, as a significant employer, purchaser of products and services, and a taxpayer.

In this chapter:

72 Competitive operations

74 Economic impacts





Targets:

CUSTOMER-ORIENTED & COMPETITIVE ACTIVITIES

- » The load factor of the Olkiluoto plant units is 90–95% as a rolling three-year average (continual).
- » The rolling three-year production cost average is below 20 €/MWh in 2022. Calculating from OL3's first full production year, the rolling three-year average is below 30 €/MWh. Reported for the first time in 2026.

NUCLEAR POWER AS A DESIRED PRODUCTION FORM

- » Reputation index over 75 (excellent) in the stakeholder survey (continual).

FUNDS READY FOR FINAL DISPOSAL

- » The necessary funds for final disposal are secured through payments to the Finnish State Nuclear Waste Management Fund (continual).

Competitive operations

Nuclear power is a competitive, low-emission electricity production method. In the future, the EU's emission reduction requirements will further improve the competitiveness of clean energy compared to fossil fuels.

One of the benefits of nuclear energy is its stable and predictable price to the owners. Most of the total costs of nuclear electricity are capital costs, while fuel costs remain fairly low. The construction and production of nuclear power do not require any financial support from society.

For more than forty years, TVO has produced electricity for its industrial and municipal owners at cost price. TVO's nuclear electricity has boosted the competitiveness of its industrial owners and their prerequisites for providing employment in Finland.

Nuclear power is an extremely efficient electricity production method: the amount of uranium fuel that fits into a matchbox is more than enough to produce electricity for one year for a family of four living in a detached house with electric heating. Electricity produced in Finland brings well-being and offers the preconditions needed for growth – now and in the future.

In the case of nuclear power, competitiveness challenges include rising costs and increased price fluctuations due to weather-dependent energy production. However, operators in the nuclear industry are actively developing the industry to secure future operational preconditions.

Profitable investment

In 2022, TVO produced approximately one-fifth of all the electricity consumed in Finland. TVO's operations are based on the production of electricity to its shareholders at cost price. The owners cover all of TVO's operating costs and, in return, receive electricity pro-rata to their ownership. The owners consume the electricity themselves or sell it to third parties. The cost-price model allows electricity companies and electricity consumers of different sizes to participate in major investments, such as those required for nuclear power, as well as reap the benefits of large-scale production. TVO's owners include 131 municipalities, which means that the benefits of cost-price electricity, with stable and predictable costs, are felt all over Finland. Due to the cost-price operating principle, TVO cannot be analysed using conventional financial indicators, as they were created for



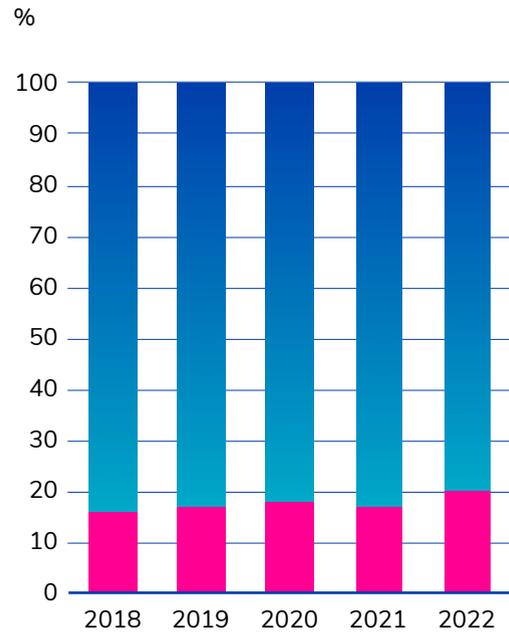
comparing companies that aim to make a profit. The indicators important to TVO and the owners include the amount of electricity produced, production cost, and load factors of the plant units.

In 2022, TVO's most important financial goals included achieving the desired production cost level and reaching the planned electricity delivery volume. The key financial responsibility indicators are discussed in the 2022 Financial Statements.

Electricity production at Olkiluoto is growing

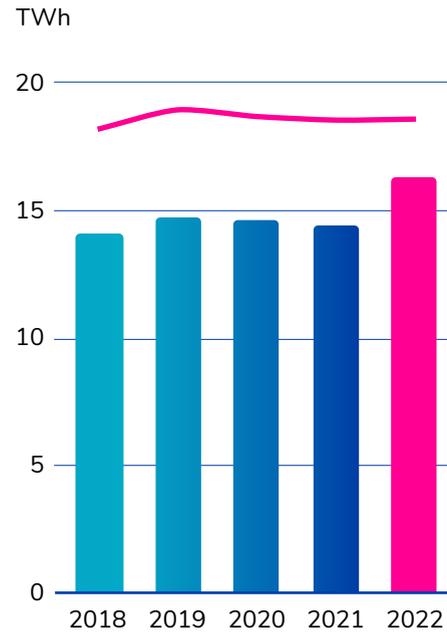
In 2022, the combined electricity output of the plant units OL1, OL2, and OL3 was 16,351 (14,438) GWh. The combined load factor of the OL1 and OL2 plant units was 93.0 percent. The plant units operated safely. The net production for OL1 was 6,932 (7,404) GWh and the load factor was 89.1 (95.1) percent. The net production for OL2 was 7,532 (7,033) GWh and the load factor was 96.8 (90.4) percent. The net production for OL3 was 1,887 GWh and the load factor was 16.9 percent. TVO's investments in 2022 amounted to EUR 339.0 million, of which the OL3 project accounted for EUR 276.0 million.

TVO's delivery share of the electricity used in Finland



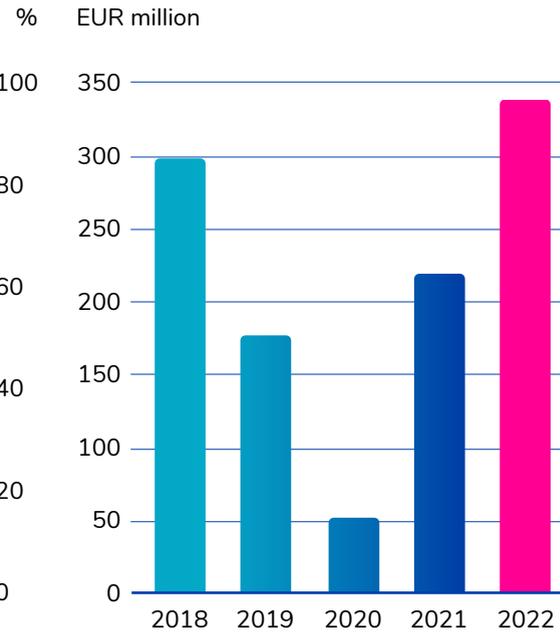
TVO's delivery share of the electricity used in Finland

TVO's electricity production



Load factor of TVO's nuclear power production, %

Investments



The Mankala model is a cornerstone of Finnish energy production



“In Finland we have this thing called Mankala Principle” is a sentence often needed when TVO’s activity is explained to foreign stakeholders. This is because the Mankala principle is a peculiarity of Finnish energy production. It says a lot about the importance of the Mankala approach that approximately one half of all electricity produced in Finland is produced under it.

In short, the Mankala principle is a method of operation where several companies jointly establish a non-profit limited company for a common purpose.

TVO is a textbook example of a Mankala company. The model has been a key enabler in the construction of a nuclear power plant, which requires huge investments. Few individual companies would have the resources for this.

In TVO’s case, the Mankala model is about producing electricity at cost price. In other words, each shareholder is obliged to pay the costs incurred by the company’s operation in proportion to their ownership, and is similarly entitled to the electricity produced by the company according to their ownership. Production costs that cause expenses for the owners include, for example, operation and maintenance costs, insurance, taxes, loans, and purchases of fuel.

– “When we meet with our stakeholders both at home and abroad, we are often asked how a private company has succeeded in building nuclear power in Finland. It is easy to answer this question by explaining the Mankala model, which has enabled the financing of new projects as well as predictable electricity production for the owners. These have played a key role in the positive development of Finland’s self-sufficiency in electricity production,” says Jaana Isotalo, Senior Vice President for HR and Communications.



Economic impacts

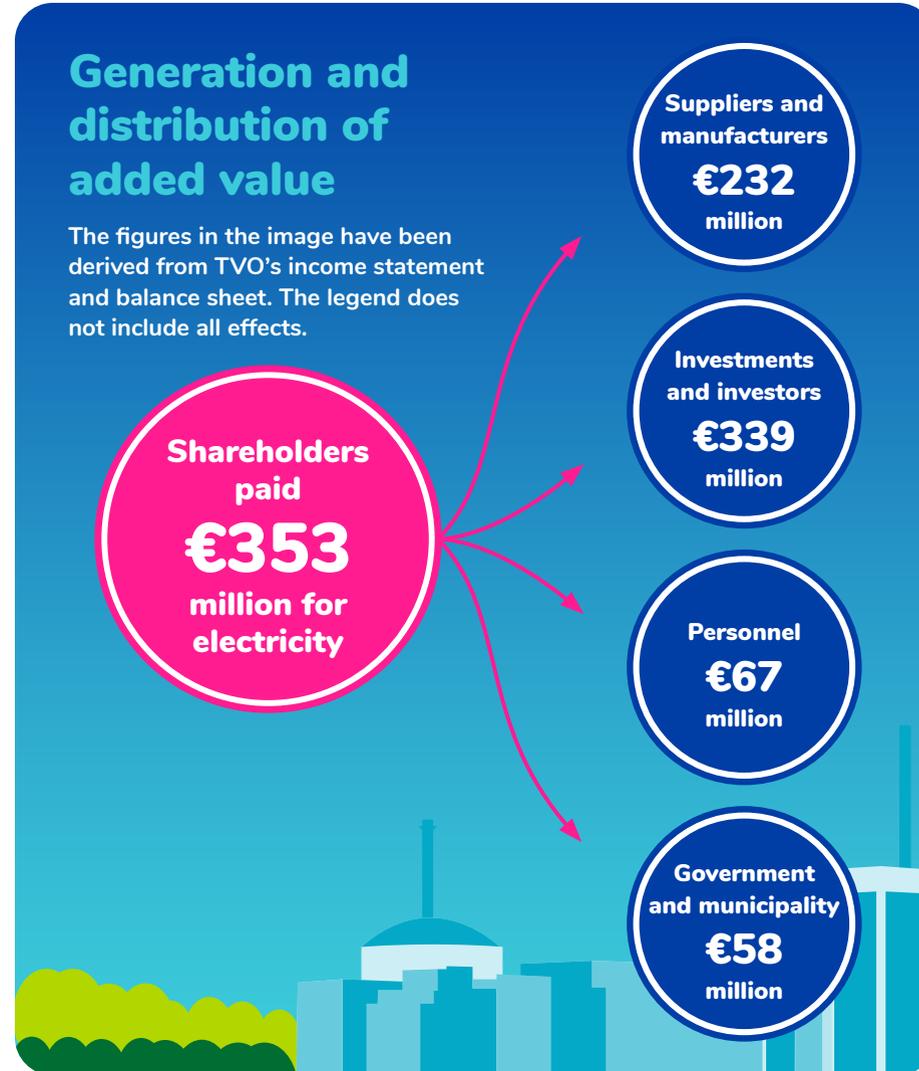
In the reporting of its economic responsibility, TVO uses the applicable indicators of the GRI Standards. TVO also reports some figures that are gathered as a part of the closing of accounts but that are not included in the actual financial statements. The economic impact (M€) of TVO to the key stakeholders is described in the figure on the right.

Generation of added value

Shareholders: TVO produces electricity to its shareholders at cost price. In 2022, TVO's shareholders paid a total of EUR 353 (294) million for the electricity. TVO supplied 16,316 GWh of electricity, which amounts to approximately one-fifth of the total volume of electricity consumed in Finland.

The electricity is distributed all over Finland via a chain of ownership, which consists of TVO's principal owner Pohjolan Voima as well as Finnish companies and power utilities of 131 municipalities which own Pohjolan Voima and receive the produced electricity.

About half of the electricity produced by TVO is used by industrial companies owned by TVO's shareholders in various localities. The other half is consumed by households, agriculture, and the service sector.



Distribution of added value

Suppliers and subcontractors 232 (234): Approximately 850 external workers participated in the annual outages, approximately 660 of them Finnish. In addition to companies from Finland, subcontractors from 19 other countries participated in the effort.

TVO's major cooperation partners have included Securitas Oy, in charge of security; Rauman Hovi Oy, in charge of the staff restaurants; and RTK-Palvelu Oy, responsible for cleaning and sanitation services. These companies employ over 340 people in Olkiluoto. In total, TVO regularly provided work for about 800 subcontractors and consultants in Olkiluoto.

Investments and investors:

Investors: At the end of the year, TVO's current and non-current liabilities amounted to EUR 5,727 (5,206) million. The Company raised a total of EUR 1,050 (800) million in new non-current liabilities, while repayments amounted to EUR 458 (567) million.

Investments: The Olkiluoto nuclear power plant is continuously kept in good condition in terms of production and functionality through alternating refuelling and maintenance outages at the plant units. Major

work during the 2022 maintenance outage included the replacement of pumps and valves in the shut-down cooling system, replacement of containment electrical penetrations, inspection of the reactor pressure vessel bottom, seawater channel servicing and the concreting of one seawater channel, feed water pump impeller replacements, the installation of one recirculation line, and the containment leak-tightness test.

In 2022, investments in the OL3 project amounted to EUR 276 (164) million.

The total R&D expenses amounted to EUR 17.1 (18.2) million, of which most were used for R&D related to nuclear waste management.

Personnel: At the end of the year, TVO employed 1,005 (982) people.

In 2022, TVO hired 87 (70) new employees, and 16 (5) employees retired.

At the end of the year, the OL3 project employed about 900 people. In addition, the subcontractor work for the project provides employment both in Finland and abroad.

State and municipality: TVO paid the municipality of Eurajoki EUR 16 (16) million in property tax.

GRI and appendices

The information in this report has been prepared in compliance with the Global Reporting Initiative (GRI) Standards (2021). The report covers the TVO Group's most material financial, social, and environmental responsibility aspects.

The employment, occupational health and safety, and training data in the report has been verified. In addition, the TVO Group's materiality analysis for sustainability is included in the scope of the assurance. The separate environmental reporting data has also been verified by an independent, objective party.

The Annual and Sustainability Report 2022 is part of TVO's overall annual reporting. Other reports published in TVO's Annual Report include the following:

- Report of the Board of Directors and Financial Statements for 2022, prepared in accordance with the IFRS Standards, which provide information on the Company's financial development. The Report of the Board of Directors covers the requirement set out in the Finnish Accounting Act for the reporting of non-financial data.
- TVO's Corporate Governance Report 2022, which describes TVO's management systems and the duties of TVO's administrative bodies.

TVO also publishes a separate Environmental Report 2022, which complies with the EMAS Regulation concerning environmental reporting. The information is based on a certified environmental management system.

In this chapter:

- 76 Responsibility reporting
- 77 GRI content index
- 80 Independent Assurance Report
- 82 Responsibility contact persons

Sustainability reporting

TVO has reported on its responsible management of the environment since 1996 and on corporate social responsibility aspects since 2001.

The Annual and Sustainability Report 2022 (1 January to 31 December 2022) has been published in Finnish and English on TVO's website on 15 February 2023. A separately published Environmental Report provides information on the environmental impact of TVO's operations, TVO's environmental protection targets as well as their achievement, and key environmental indicators.

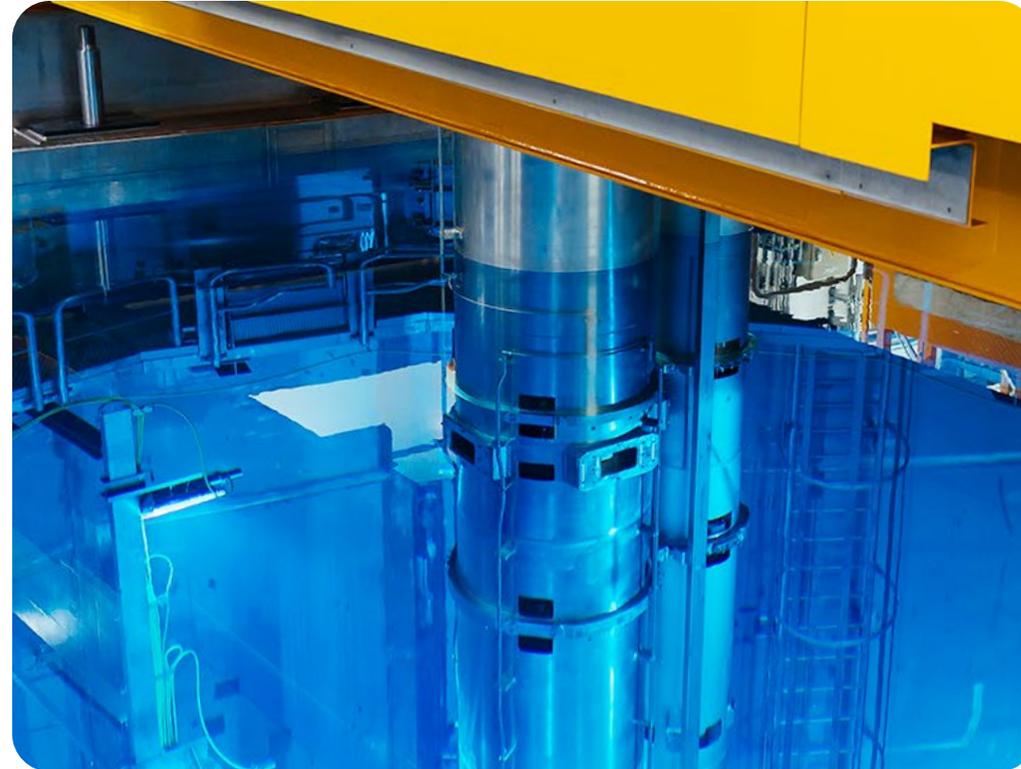
The sustainability reporting data for 2021 was published on TVO's website in February 2022. The 2023 data will be published in spring 2024. Limited external assurance of the sustainability reporting was carried out by KPMG Oy Ab. The limited assurance covered the information on employment, occupational health and safety, and training in the sustainability reporting. In addition, the TVO Group's materiality analysis for sustainability was included in the scope of the assurance. The assurance report is available in the section "Independent Assurance Report to the Management of Teollisuuden Voima Oyj" of this report. DNV Business Assurance

Finland Oy Ab, an independent and impartial accredited certification body, has verified the data in the Environmental Report. The statement is available under "Verification Report" in the Environmental Report. The accounting, Financial Statements, Report of the Board of Directors, and administration for 2022 have been audited by PricewaterhouseCoopers Oy, Authorised Public Accountants.

Measurement and calculation principles

This report has been prepared in accordance with the 2021 Global Reporting Initiative (GRI) Standards. The reporting principles pertaining to quality in the GRI Standards have been taken into account during the reporting process.

The report covers the operations of the Teollisuuden Voima Group (TVO, TVONS) and the operations regionally across Finland, unless separately specified in conjunction with the reporting that the information concerns the parent company level. The reporting also describes the operations of Posiva and its subsidiary PSOY; Posiva is a company jointly owned by TVO and Fortum Power and Heat Oy, and it is responsible for its owners' final



disposal operations. Accident and training data is reported, to some extent, for TVO's contractors.

The TVO Group has defined several of its own aspects for reporting purposes to complement the material aspects

included in the GRI Standards. These describe material sustainability aspects that are typical for the TVO Group. These aspects that are material specifically for the Group include the number of subcontractors during the annual outage, average number of subcontractors at

the OL3 project, occupational health and safety, preparation for emergencies and exceptional situations, level of safety, acceptability of nuclear power, investments to secure the availability and profitability of the plant units, and the decommissioning of the nuclear power plants. Any changes to previously reported information are indicated separately in conjunction with the information in question.

The majority of the data presented in the sustainability reporting is based on the data reported to the authorities, which has also been published in TVO's other annual reports. The occupational safety information concerning the personnel is based on the management system for occupational health and safety; the other information is based on the personnel data collected on the Company's or Group's operations. In the reporting of its economic responsibility, TVO uses the applicable indicators of the GRI Standards. In its sustainability reporting, TVO also reports some figures that are gathered as a part of the closing of accounts but that are not included in the actual financial statements. An independent greenhouse gas verifier has verified the amount of carbon dioxide emissions.



GRI content index

Teollisuuden Voima Oyj (TVO) has reported in accordance with the GRI Standards for the period from 1 January 2022 to 31 December 2022.

TVO's responsibility aspect	Location and comments
GRI 2: GENERAL DISCLOSURES (2021)	
Organizational profile	
2-1: Organizational details	TVO in brief p. 3 Sustainability contact persons p. 82 Corporate Governance Statement p. 3
2-2: Entities included in the organization's sustainability reporting	TVO in brief p. 3 Sustainability reporting p. 76
2-3: Reporting period, frequency and contact point	GRI and appendices p. 75 Sustainability reporting p. 76 Sustainability contact persons p. 82
2-4: Restatements of information	Sustainability reporting p. 76, 77
2-5: External assurance	GRI and appendices p. 75 Sustainability reporting p. 76 Independent Assurance Report to the Management of Teollisuuden Voima Oyj p. 80–81
Activities and workers	
2-6: Activities, value chain and other business relationships	TVO in brief p. 3 Value creation p. 8 Responsible procurement operations p. 21–22
2-7: Employees	Personnel p. 56 Social responsibility indicators p. 67–68
2-8: Workers who are not employees	Personnel p. 56–57 The number of workers who are not employees is obtained directly from subcontractor/partner companies.
Governance	
2-9: Governance structure and composition	Responsible leadership p. 10–12 Corporate Governance Statement p. 5–10 and 16–18
2-10: Nomination and selection of the highest governance body	Corporate Governance Statement p. 5–6 Board members are elected in accordance with good governance, taking into account the ability and competence profile of the person elected in carrying out duties as a Board member.

TVO's responsibility aspect	Location and comments
2-11: Chair of the highest governance body	Corporate Governance Statement p. 5–6
2-12: Role of the highest governance body in overseeing the management of impacts	Responsible leadership p. 10–12 Safety p. 28 Occupational health and safety p. 64 Report of the Board of Directors and Financial Statements p. 6–7 and 12 Corporate Governance Statement p. 5
2-13: Delegation of responsibility for managing impacts	Responsible leadership p. 10–12 Corporate Governance Statement p. 7
2-14: Role of the highest governance body in sustainability reporting	Responsible leadership p. 10–12 Corporate Governance Statement p. 5
2-15: Conflicts of interest	Corporate Governance Statement p. 12 Report of the Board of Directors and Financial Statements p. 12
2-16: Communication of critical concerns	Corporate Governance Statement p. 12 Report of the Board of Directors and Financial Statements p. 12
2-17: Collective knowledge of the highest governance body	GRI index Almost all members of the Board serve in the management of listed companies. Therefore, no special need for additional training has been identified.
2-18: Evaluation of the performance of the highest governance body	Responsible leadership p. 10–12 Corporate Governance Statement p. 5
2-19: Remuneration policies	Report of the Board of Directors and Financial Statements p. 49 Corporate Governance Statement p. 11 Responsible leadership p. 10–12
2-20: Process to determine remuneration	Corporate Governance Statement p. 4–5 and 7–8 Report of the Board of Directors and Financial Statements p. 31 Personnel p. 56–57
2-21: Annual total compensation ratio	GRI index p. 77–79 Information unavailable. Data not available for the reporting period. TVO's target is to report the figure in the 2023 report.



TVO's responsibility aspect	Location and comments
Strategy, policies and practices	
2-22: Statement on sustainable development strategy	Review by the president and CEO p. 5
2-23: Policy commitments	Responsible leadership p. 10 Report of the Board of Directors and Financial Statements p. 11 and 16 TVO Code of Conduct, Group-level policies
2-24: Embedding policy commitments	Responsible leadership p. 10 Group-level policies
2-25: Processes to remediate negative impacts	Review by the president and CEO p. 5 Effects of climate change on the business p. 17-18 Stakeholder cooperation p. 19 Radiation safety p. 65 Report of the Board of Directors and Financial Statements p. 7 and 12
2-26: Mechanisms for seeking advice and raising concerns	Value creation p. 8 Stakeholder cooperation p. 19 Report of the Board of Directors and Financial Statements p. 7 and 12
2-27: Compliance with laws and regulations	Cooperation with authorities p. 51 No transgressions during the reporting period.
2-28: Membership associations	Stakeholder cooperation p. 19-20
Stakeholder engagement	
2-29: Approach to stakeholder engagement	Responsible leadership p. 12 Stakeholder cooperation p. 19-20 Responsible procurement operations p. 21-22 Safety p. 28 Safety culture p. 30 Economic impacts p. 74
2-30: Collective bargaining agreements	Personnel p. 57
GRI 3: MATERIAL TOPICS (2021)	
3-1: Process to determine material topics	Responsible leadership p. 12
3-2: List of material topics	Responsible leadership p. 12
3-3: Management of material topics	Sustainability Roadmap 2030 p. 13-15 Environmental management p. 16 Effects of climate change on the business p. 17-18 Stakeholder cooperation p. 19 Radiation safety p. 65
ECONOMIC STANDARDS	
GRI 201: ECONOMIC PERFORMANCE (2016)	
201-1: Direct economic value generated and distributed	Value creation p. 8 Creation of added economic value p. 71 Competitive operations p. 72-73 Economic impacts p. 74

TVO's responsibility aspect	Location and comments
GRI 203: INDIRECT ECONOMIC IMPACTS (2016)	
203-2: Significant indirect economic impacts	Value creation p. 8 Responsible procurement operations p. 21 Research and development p. 23
ENVIRONMENTAL STANDARDS	
GRI 301: MATERIALS (2016)	
301-1: Materials used by weight or volume	Environmental balance sheet p. 38 Cooling water p. 39 Raw materials and material efficiency p. 40
GRI 302: ENERGY (2016)	
302-1: Energy consumption within the organization	Environmental management p. 16 Environmental balance sheet p. 38 Cooling water p. 39 Raw materials and material efficiency p. 40 Production and energy efficiency p. 41, 43 Economic impacts p. 74
302-4: Reduction of energy consumption	Environmental management p. 16 Production and energy efficiency p. 41, 43
GRI 303: WATER AND EFFLUENTS (2018)	
303-1: Interactions with water as a shared resource	Environmental management p. 16 Environment and energy efficiency programme p. 36 Follow-up for environmental impacts p. 37 Environmental balance sheet p. 38 Cooling water p. 39 Raw materials and material efficiency p. 40 Releases into water and soil p. 45 Environmental research and biodiversity p. 48-49
303-2: Management of water discharge-related impacts	Environmental management p. 16 Cooling water p. 39 Releases into water and soil p. 45 Environmental research and biodiversity p. 48-49
303-3: Water withdrawal	Cooling water p. 39 Raw materials and material efficiency p. 40
303-4: Water discharge	Cooling water p. 39 Releases into water and soil p. 45
303-5: Water consumption	Environmental balance sheet p. 38



TVO's responsibility aspect	Location and comments
GRI 305: EMISSIONS (2016)	
305-1: Direct (Scope 1) GHG emissions	Sustainability Roadmap 2030 p. 13–15 Effects of climate change on the business p. 17–18 The environmental impacts of nuclear power p. 32 Finland's greatest climate act p. 34 Environmental balance sheet p. 38 Releases into air p. 44 Emissions calculated according to the GHG Protocol, reference year 2020, for activities under the TVO Group's operational control.
305-7: Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	Effects of climate change on the business p. 17–18 Releases into air p. 44 Cooperation with authorities p. 50 Sustainability reporting p. 76 The calculations are based on fuel classification data from Statistics Finland.
GRI 306: WASTE (2020)	
306-1: Waste generation and significant waste-related impacts	Responsibility for the environment and climate p. 35 Waste p. 46–47 Environmental research and biodiversity p. 48–49 Cooperation with authorities p. 50 Final disposal of spent nuclear fuel p. 52–54
306-2: Management of significant waste-related impacts	Responsibility for the environment and climate p. 35 Waste p. 46–47 Environmental research and biodiversity p. 48–49 Cooperation with authorities p. 50 Final disposal of spent nuclear fuel p. 52–54
306-3: Waste generated	Waste p. 46–47 Based on weighing data, either at TVO or at the waste recipient.
SOCIAL STANDARDS	
GRI 401: EMPLOYMENT (2016)	
401-1: New employee hires and employee turnover	Social responsibility indicators p. 67, 70 Regional distribution is not reported, as TVO only operates in Southern Finland.

TVO's responsibility aspect	Location and comments
GRI 403: OCCUPATIONAL HEALTH AND SAFETY (2018)	
403-1: Occupational health and safety management system	Responsible leadership p. 10–11 Responsible procurement operations p. 21 Occupational well-being p. 58–59 Competence development p. 60–61 Occupational health and safety p. 63–64 Radiation safety p. 65
403-2: Hazard identification, risk assessment, and incident investigation	Occupational health and safety p. 63–64
403-3: Occupational health services	Occupational well-being p. 58–59
403-4: Worker participation, consultation, and communication on occupational health and safety	Occupational well-being p. 58 Occupational health and safety p. 63–64
403-5: Worker training on occupational health and safety	Occupational well-being p. 58–59 Competence development p. 60–62
403-6: Promotion of worker health	Occupational well-being p. 58–59
403-7: Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	Occupational well-being p. 58–59 Competence development p. 60–62 Occupational health and safety p. 63–64
403-8: Workers covered by an occupational health and safety management system	Occupational health and safety p. 63
403-9: Work-related injuries	Occupational health and safety p. 63–64
GRI 404: TRAINING AND EDUCATION (2016)	
404-1: Average hours of training per year per employee	Competence development p. 60–61
TVO'S OWN INDICATORS	
TVO: Number of employees during annual outage	Safety p. 28 Personnel p. 56–57
TVO: Average number of subcontractors' employees on OL3 site	Personnel p. 56–57
TVO: Occupational health and safety	Occupational well-being p. 58–59 Occupational health and safety p. 63–64
TVO: Preparing for crises and emergencies	Safety p. 27–29
TVO: Level of safety	Safety p. 27–29
TVO: Investments to secure the availability and profitability of plant units	Economic impacts p. 74
TVO: Decommissioning of the nuclear power plant	Waste p. 46–47 Environmental research and biodiversity p. 48–49 Final disposal of spent nuclear fuel p. 52–54

Independent Assurance Report to the Management of Teollisuuden Voima Oyj

This document is an English translation of the Finnish report

We have been engaged by the Management of Teollisuuden Voima Oyj (hereafter “TVO”) to provide limited assurance on selected corporate responsibility indicators presented in TVO’s Corporate Responsibility Report 2022 (hereafter “Selected Corporate Responsibility Information”) for the year ended 31 Dec 2022.

The Selected Corporate Responsibility Information consists of:

THE FOLLOWING INDICATORS PRESENTED IN THE “SUSTAINABILITY ROADMAP 2030” SECTION:

- » Occupational health and safety: Accidents and Accident frequency
- » Occupational wellbeing: Personnel survey result, Sick leaves and Employees’ pension insurance (TyEL) category
- » High-class expertise: Actualisation rate of competence surveying and Inspection rate of individual training plans

- » Professional development: Employees’ changes in position and Actualisation rate of navigation discussions

THE FOLLOWING INDICATORS PRESENTED IN THE “GRI INDEX” SECTION:

- » General Disclosures: GRI 102-8: Information on employees and other workers and GRI 102-41: Collective bargaining agreements
- » Employment: GRI 103: Management Approach and GRI 401-1: New employee hires and employee turnover
- » Occupational Health and Safety: GRI 103: Management Approach and GRI 403-9: Work-related injuries
- » Training and Education: GRI 103: Management Approach and GRI 404-1: Average hours of training per year per employee
- » TVO’s own indicators: Subcontractors working in Annual Outages of OL1 and OL2 and Average workforce at the Olkiluoto 3 construction site
- » GRI 3-1: process to determine material topics

Management’s responsibilities

The Management of TVO is responsible for the preparation and presentation of the Selected Corporate Responsibility Information in accordance with the reporting criteria, i.e. GRI Sustainability Reporting Standards, and the information and assertions contained within it. The Management is also responsible for determining TVO’s objectives with regard to sustainable development performance and reporting, including the identification of stakeholders and material issues, and for establishing and maintaining appropriate performance management and internal control systems from which the reported performance information is derived.

Our responsibilities

Our responsibility is to carry out a limited assurance engagement and to express a conclusion based on the work performed. We conducted our assurance engagement on the Selected Corporate Responsibility Information in accordance with

International Standard on Assurance Engagements (ISAE) 3000 (Revised), Assurance Engagements other than Audits or Reviews of Historical Financial Information, issued by the International Auditing and Assurance Standards Board IAASB. That Standard requires that we plan and perform the engagement to obtain limited assurance about whether the Selected Corporate Responsibility Information is free from material misstatement.

KPMG Oy Ab applies International Standard on Quality Management ISQM 1 which requires the firm to design, implement and operate a system of quality management including policies or procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

We have complied with the independence and other ethical requirements of the International Ethics Standards Board for Accountants’ International Code of Ethics for Professional Accountants, (including

International Independence Standards) (IESBA Code), which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

Procedures performed

A limited assurance engagement on Selected Corporate Responsibility Information consists of making inquiries, primarily of persons responsible for the preparation of information presented in the Selected Corporate Responsibility Information, and applying analytical and other evidence gathering procedures, as appropriate. In the engagement, we have performed the following procedures, among others:

- » Interviewed the members of TVO’s senior management and relevant staff responsible for providing the Selected Corporate Responsibility Information;
- » Assessed the application of the GRI Sustainability Reporting Standards reporting principles in the presentation of the Selected Corporate Responsibility Information;



- » Assessed data management processes, information systems and working methods used to gather and consolidate the Selected Corporate Responsibility Information;
- » Reviewed the presented Selected Corporate Responsibility Information and assessed its quality and reporting boundary definitions;
- » Assessed the Selected Corporate Responsibility Information's data accuracy and completeness through a review of the original documents and systems on a sample basis and;
- » Conducted a site session to review the Selected Corporate Responsibility Information on TVO's sites.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

Inherent limitations

Inherent limitations exist in all assurance engagements due to the selective testing of the information being examined. Therefore fraud, error or non-compliance may occur and not be detected. Additionally, non-financial data may be subject to more inherent limitations than financial data, given both its nature and the methods used for determining, calculating and estimating such data.

Conclusion

Our conclusion has been formed on the basis of, and is subject to, the matters outlined in this report.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusions.

Based on the procedures performed and the evidence obtained, as described above, nothing has come to our attention that causes us to believe that the Selected Corporate Responsibility Information subject to the assurance engagement is not prepared, in all material respects, in accordance with the GRI Sustainability Reporting Standards.

Helsinki, 14 February 2023

KPMG Oy Ab

Esa Kailiala

Authorised Public Accountant

Tomas Otterström

Partner, Advisory



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