2023

ANNUAL AND SUSTAINABILITY REPORT

tvo

Contents

TVO's Annual Report 2023

TVO's Annual Report includes the Annual and Sustainability Report, the Corporate Governance Statement, the Report of the Board of Directors and the 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 account of the key aspects and targets of TVO's business and sustainability as well as a review by the President and CEO.

Corporate Governance Statement
The Corporate Governance Statement describes TVO's management systems and the duties of TVO's administrative bodies.

Report of the Board of Directors and Financial Statements
The Report of the Board of Directors and Financial Statements provide information on the company's financial development. The Report of the Board of Directors covers the reporting of non-financial data set out in the Finnish Accounting Act.

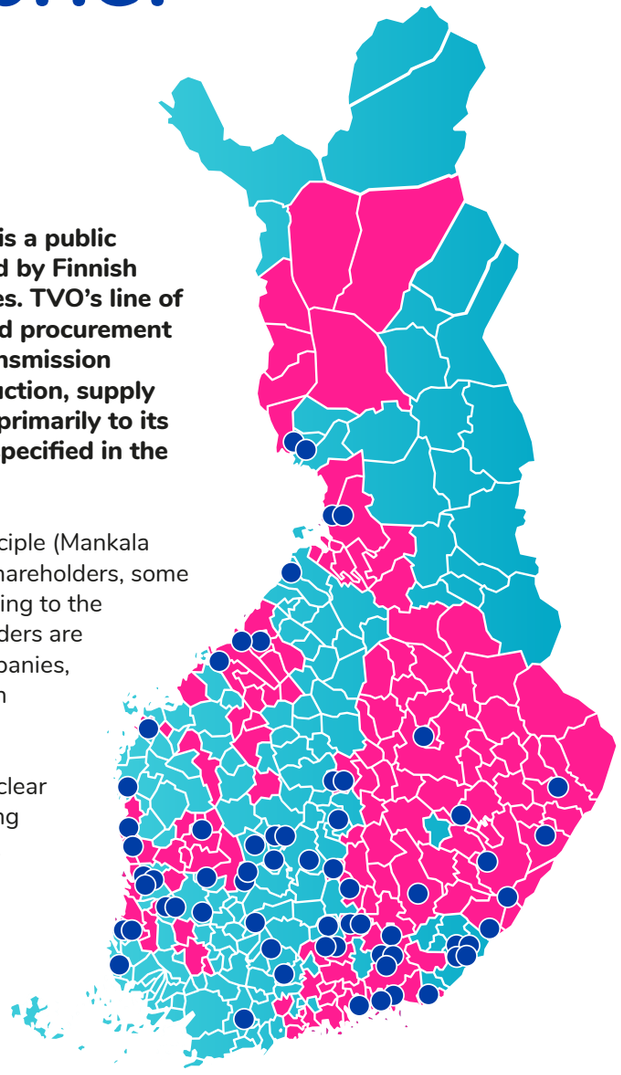
TVO in brief

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 on a cost-price principle (Mankala principle). TVO is owned by five shareholders, some of which, like TVO, operate according to the Mankala 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

€873 million

Electricity production

24.67 TWh

TVO personnel

1,055 people

TVO's values

Responsibility, transparency, proactivity, and continuous improvement.

Subsidiaries and joint ventures

tvo

An electricity production company

tvons

A consulting services company fully owned by TVO

Posiva

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

Posiva Solutions

A consulting services company fully owned by Posiva

The year 2023

21 Feb

First **test deposition holes drilled by Posiva** were completed

16 Apr

Regular electricity production started at Olkiluoto 3 EPR

20 Apr

TVO confirmed **takeover of Olkiluoto 3 EPR for the warranty period**

20 May

Annual outages completed at Olkiluoto

21 Jun

TVO published **the Green Bond Framework** as part of the company's financing arrangements

Summer

Nuclear power is clearly visible in **the government's programme**

10 Oct

TVO is analysing the possibility of **extending the service life** of two plant units at Olkiluoto

17 Oct

Olkiluoto 3 has been **running according to plan for almost six months**

15 Dec

TVO issued **Green Bonds of EUR 280 million**

31 Dec

Approximately **31% of the electricity consumed** in Finland was produced in Olkiluoto

Review by the President and CEO

Becoming Finland's most significant producer of electricity

Electricity is now being talked about more than ever. Be it price, availability, security of supply or degree of self-sufficiency, these topics have been highly visible month after month. A commodity that was previously almost taken for granted has become something to be actively followed in everyday life. Households are scheduling their chores according to the price of electricity.

In recent years, the Finnish electricity system has taken significant steps in a cleaner direction. Imports from Russia have stopped, and capacity for weather-dependent production has increased significantly. At the same time, the importance of balancing power has increased; we need more of it. Price variations have grown and are likely here to stay. It is, of course, important that we have more baseload power to stabilise the price. Over the past year, Olkiluoto became Finland's most significant producer of electricity, and Finland became self-sufficient in terms of electricity on an annual level. We are lucky to have Olkiluoto.

In all of this, the significance of nuclear power as stable and predictable base load power has increased even further, which the Finns have also understood. The majority of Finns stand exceptionally united behind nuclear power. In Finnish Energy's "Energy Attitudes" survey, which is carried out twice per year, the overall support for nuclear power reached a level of 82% in December 2023. The support for nuclear power is high in all demographics regardless of gender, municipality of residence, age and political views.

Attitudes have warmed towards nuclear power elsewhere in Europe as well. In Sweden, the new government has introduced its new nuclear power programme which has a concrete goal of adding a total of 2,500 megawatts of new nuclear power to electricity generation by 2035. During the UN's Dubai climate summit (COP28), the importance of nuclear power was recognised for the first time, and a total of 22 countries declared that they were tripling nuclear energy production by 2050. Alongside the renewable forms of energy generation, there is demand for clean and reliable base load power that can stabilise prices.

One of the basic pillars for the sustainability and cleanliness of nuclear power is the question related to the final disposal of nuclear fuel. At Olkiluoto, the work of Posiva – a joint venture of TVO and Fortum – for starting the final disposal of spent nuclear fuel is reaching the final stretch. We can confidently state that we have a responsible solution for the final disposal of spent fuel and, thereby, nuclear power can be classified as a sustainable form of production. Nuclear power has been included in the EU Taxonomy for sustainable financing, and our electricity production at Olkiluoto has been demonstrated to be 100% in alignment with the EU Taxonomy. Last December, we were the first nuclear power company in Europe to issue a Green Bond.

Olkiluoto had a historic year of production: OL3 entered regular electricity production, and we produced approximately 31 per cent of the electricity consumed in Finland in 2023. OL3 is set up to produce electricity far into the future, at least for the next 60 years. OL1 and OL2 plant units have operating licences until 2038, and an analysis is under way that aims at extending the operating licences by at least ten more years, until 2048. At the same time, we are investigating the possibility of a reactor power uprating. The environmental impact assessment related to these analyses that was started in January 2024 is likely to last for several more months.

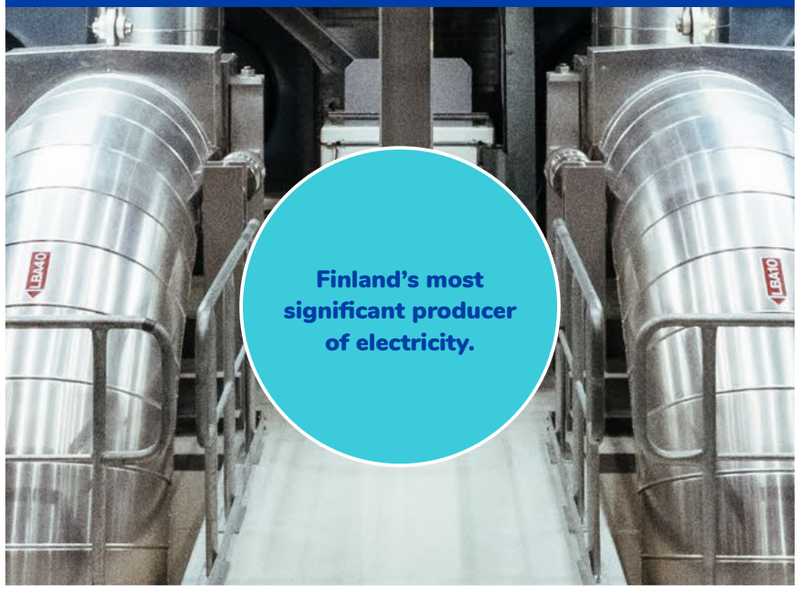
In the nuclear power industry, sustainability is at the core of everything we do, and its most important aspect is nuclear safety. Safe, predictable, competitive and climate-friendly electricity production and an energetic work community are the things we are leveraging to aim towards our vision of being Finland's most significant producer of electricity. Steadily, the nuclear power industry is taking us to a particle-larly great future.

JARMO TANHUA
President and CEO, TVO

Strategy

MISSION - what is our purpose

VISION - what we want to become



VALUES - how we act

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 generation cost remains competitive and that the availability 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 life cycle. 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 goals, such as those set in the Paris Agreement. It is the TVO's vision is to be the most significant producer of electricity in Finland.

TVO manages the entire life cycle of nuclear power. Posiva, a company jointly owned by TVO and Fortum Power and Heat Oy (Fortum), is the first in the world to have a solution for the final disposal of spent nuclear fuel, and industrial final disposal operations are expected to start in the mid-2020s at Olkiluoto

Operating environment

The Finnish Government led by Petteri Orpo that took office in the summer of 2023 aims to increase nuclear power capacity in Finland. Orpo's government is promising to approve all applications for decisions-in-principle for nuclear power plants that meet the defined criteria. It also aims to renew the Nuclear Energy Act in order to allow projects to proceed more fluently and to improve Finland's competitiveness as an investment target. The work started by the Ministry of Economic Affairs and Employment (MEAE) that aims at a comprehensive reform of the Nuclear Energy Act has continued during 2023.

The renewal of the EU's electricity market rules is in the trilogue negotiation stage. According to the compromise achieved between the Member States, governments will be allowed to use Contracts for Difference (CfD) towards new nuclear power investments as well as for the service life extension and power uprating of nuclear reactors. The European Parliament, however, would not allow the use of CfDs to support service life extension. A final decision on the matter is expected in early 2024.

The European Parliament has finalised its position on the Net-Zero Industry Act (NCIA) which aims at increasing the production capacity required for Europe's green transition. In the Parliament's position, fission and fusion technology were included in the list of technological solutions receiving support. The trilogue negotiations may begin once the Member States have finalised their own positions.

The European Commission has decided to establish an industry alliance around SMR technology. Industry alliances bring together public and private actors, governments, researchers and civil society. Their aim is to help the EU achieve its key goals, such as those related to the mitigation of climate change.

The Commission will publish a communiqué on the emission reduction targets for 2040 during the first quarter of 2024. The actual legislation regarding the target and the actions taken in order to achieve it will be issued during the term of the next Commission.

In Finnish Energy's "Energy Attitudes" survey, which is carried out each year, the overall support for nuclear power in November 2023 was 82%, with 54% of Finns wanting to increase the amount of nuclear power and 28% considering that the current amount is appropriate.

The United Nations' COP28 climate summit was held in Dubai in the United Arab Emirates at the turn of December 2023. The summit's resolution calls for discontinuing the use of fossil fuels and replacing them with zero-emission or low-emission energy sources. The resolution aims at global climate neutrality by 2050 and lists technologies, such as nuclear power, whose production must be accelerated. This is the first time that nuclear power has been formally mentioned as one solution for the climate crisis in a COP resolution.

22 countries, Finland included, declared within the context of the COP conference that they will be tripling the production of nuclear energy by 2050 in order to achieve climate neutrality. The Net Zero Nuclear Industry Pledge states that the IAEA plays a key role in its member states including nuclear power in their national energy plans, and that it is important to agree on financing for new nuclear power.

Value creation

The TVO Group utilises various resources, creating significant impacts in terms of society with its actions.

Mission, vision, and values

Strategy

TVO • TVONS

TVO Group – a valued pioneer of the nuclear industry

POSIVA • PSOY

Operating environment

Risks and opportunities

Resources:

FINANCIAL RESOURCES
- Variable and fixed costs paid by the shareholders (Mankala principle)
- Financing from shareholders and the loan market

INFRASTRUCTURE
- Plant units OL1, OL2 and OL3
- Disposal facility for spent fuel
- Other infrastructure at Olkiluoto, e.g. operating waste repository, interim storage for spent fuel and battery energy storage

PEOPLE & COMPETENCE
- More than **1,000** competent professionals
- Contractors and consultants
- Long careers and high level of training: **9.9** days of training/person
- Nuclear power expertise that is based on years of experience and valued internationally
- R&D investments: EUR **15.9** million

INTELLECTUAL CAPITAL
- Company culture and values: nuclear professionalism
- The Olkiluoto and ONKALO® brands

COMMUNITY RELATIONS
- Active stakeholder collaboration and influencing within society
- International cooperation within nuclear industry communities

NATURAL RESOURCES
- Use of seawater as cooling water for plant units: **3,706** million m^3
- Uranium fuel: **33.31** t
- Constructed area at Olkiluoto: approx. **170** ha

Impacts:

FINANCIAL IMPACTS
- Electricity delivered to shareholders: **24,634** GWh
- TVO Group's turnover: EUR **876.2** million
- Investments: EUR **449.0** million
- Business opportunities for partners and suppliers in Satakunta and elsewhere
- Property tax to the municipality of Eurajoki: EUR **18** million

PEOPLE & COMPETENCES
- Sick leave percentage: **2.8**%
- Employee satisfaction **69.4**/100 (personnel survey, 2023)
- Strengthening and upholding nuclear power expertise
- Pioneering final disposal in the world
- Close collaboration with educational institutions
- Exemplary safety culture
- High load factors (OL1 and OL2): **91.9**%

COMMUNITY RELATIONS
- Support for nuclear power at a record high level in Finland: **82**% view nuclear power positively ("Energy Attitudes" survey, Finnish Energy)
- TVO's reputation index **84**/100 in the stakeholder survey (2023)
- Regional economic impacts in Satakunta

NATURE
- Approx. **20** million tonnes of CO_2 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: **14,512** GWh/km^2
- Thermal load caused by cooling water on the local sea area: **44.3** TWh

* The figures presented in the model concern the year 2023, unless stated otherwise.

Sustainability at the core of all operations

Sustainability is an integral part of the TVO Group's strategy and one of the group's 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 2023, this aspect has focused on starting regular electricity production at OL3. With regular electricity production at OL3, Olkiluoto can produce approximately 30 per cent of Finland's electricity while safely managing the entire nuclear power life cycle – from bedrock to bedrock.

In this chapter:

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, the Code of Conduct being included in the contracts signed with subcontractors and partners. The Group's employees and subcontractors working in Olkiluoto must complete an online training course on the Code of Conduct. 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 Audit 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 activity-based management 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 and environmental, health and safety standards, and it has been certified by DNV Business Assurance Finland Oy Ab. The general part of the activity-based management system also acts as the licensee's quality management system that has been approved by STUK. The implementation, functionality and effectiveness of the activity-based management system are regularly tracked through internal audits and management reviews.

TVO's activity-based management system meets the requirements of the following procedures and standards, among others:

- Quality management system ISO 9001:2015, STUK YVL A.3 Leadership and management for safety
- Environmental management system ISO 14001:2015, Commission Regulation 2017/1505
- Energy efficiency system (ETJ+)
- Occupational health and safety management system ISO 45001:2018

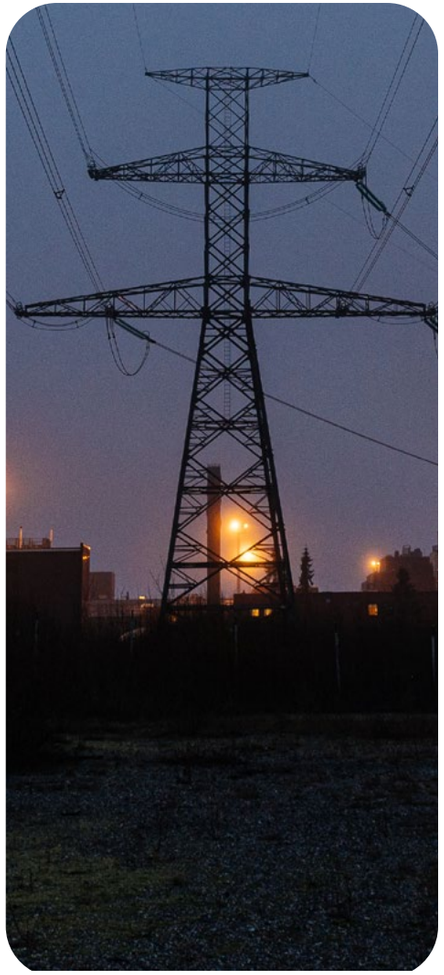
LEARN MORE:

- **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 the safety culture.



The Audit and Finance Committee's responsibilities include monitoring the development of shareholder value. In accordance with its charter that entered into force on 22 June 2023, the task of the OL3 Committee is to control and supervise the financial and technical matters following the start of commercial at the OL3 until the Final Takeover of the plant unit.

The Board discusses sustainability matters regularly according to its annual schedule. Matters related to nuclear safety and industrial safety are discussed at each board meeting. In 2023, the Board also discussed topics related to sustainability reporting, risk management, safety and safety culture, legal matters and internal audit during its meetings.

The Board has discussed and approved the Annual Report's reporting of non-financial information for 2023, including the Group's material sustainability aspects. The Board considers the views of stakeholders in its work using results from 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 in terms of, among other things, internalising the Company's mission, strategic goals, operational guidelines, operating principles and handling key issues as well as 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 2023, sustainability work at TVO was reorganised. From 1 October 2023, Anja Ussa is the SVP for Sustainability.

IN 2023, 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, Sustainability (from 1 October 2023 onwards), IT, Business Development and Assistant Services
- Environmental responsibility: **Veli-Pekka Nurmi**, Senior Vice President, Safety and Security Services
- Business ethics and compliance: **Ulla-Maija Moisio**, 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 2023, the Management Group's performance bonuses were linked to the introduction of proactive safety metrics and the goal of zero lost-time accidents 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 Affairs function, the internal audit unit or the Safety & Security function. The internal audit 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 updated composition and tasks of the Sustainability Team were approved by the TVO Group's Management Group on 9 October 2023.

The duties of the Sustainability Team include the following:

- Leading and monitoring the TVO Group's sustainability goals, action plan and indicators and making decisions on them.
- Considering stakeholder expectations.
- Integrating sustainability into the Group's strategy, leadership and development
- Drawing up the sustainability policy and developing it.
- Executing actions according to the CSRD and ESRS requirements and reporting on them.
- Meeting the requirements for sustainability reporting.
- Reporting on sustainability matters to the President and CEO and the Management Group as well as the Audit and Financing Committee and Board of Directors for the purpose of decision-making.
- The Sustainability Team reports to the President and CEO via the Management Group.
- The team consists of representatives from the leadership of sustainability and its subareas, as well as reporting and communications. New members may be invited to join the team if necessary. Representatives from various functions may visit the team's meetings when needed.
- The team convenes at least twice per year. The team is chaired by the SVP for Finance.

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 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 the autumn of 2022, and the standards in the Global Reporting Initiative (GRI) Framework (2021) were used as the basis for the definition of materiality.

The materiality analysis comprised various work stages: background research, interviews of stakeholders and a targeted online survey for 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 the 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 the positive and negative impacts of the Group on the environment, people and the 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 views, a list of material sustainability aspects was created, reflecting the Group's most significant impacts on the environment, people and the 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. Sustainability 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

Preparing for reporting in accordance with the new Corporate Sustainability Reporting Directive (CSRD)

In 2023, TVO prepared for reporting in accordance with the new Corporate Sustainability Reporting Directive (CSRD) by performing a double materiality analysis and gap analysis. The results of the double materiality analysis and the gap analysis will be completed in early 2024.

The members of the Board of Directors improved their competence in reporting pursuant to the new Corporate Sustainability Reporting Directive (CSRD) in a training arranged by PriceWaterhouseCoopers Oy (PwC) in autumn 2023.

People responsible for annual reporting also took part in two CSRD trainings arranged by PriceWaterhouseCoopers Oy in November 2023.

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 to achieve 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 was updated in December 2023 based on the results of the materiality analysis for sustainability, which was updated in the autumn of 2023.

CLIMATE-FRIENDLY ELECTRICITY FOR SOCIETY

THEME	TARGET	ACTUAL RESULT 2023	SDG
Climate-friendly electricity production	» With the regular electricity production of OL3, approximately 30% of Finland's electricity can be produced at Olkiluoto, and by replacing the average electricity production carbon dioxide emissions in EU-27 countries, OL3's production reduces annual carbon dioxide emissions by approximately 3,5 million tonnes.	» OL3 commenced commercial operation on May 1, 2023. » Lifecycle GHG emissions were calculated for all plants collectively with a GWP-total without downstream infra 9.1 g CO_2e/kWh (with downstream infra 13.8 g CO_2e/kWh)	7.1 13.2
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.	» The processing of Posiva's operating licence has progressed at the Radiation and Nuclear Safety Authority (STUK), and Posiva submitted responses to the requests for additional information. In September 2023, the Radiation and Nuclear Safety Authority reported that the safety assessment and statement on the operating licence application for the final disposal facility for spent nuclear fuel will not be completed in 2023. » The progress of Posiva's project is described in more detail in the chapter "Final disposal of spent nuclear fuel" (p. 55–57).	7.1
Emissions	» TVO Group's own operations are climate neutral by 2030.	» The TVO Group's Scope 1 greenhouse gas emissions were 2,337 t CO_2eq. Scope 2 emissions were 37,809 t CO_2eq.	7.1
	» The thermal load of cooling water does not exceed **56.9 TWh** annually.	» The thermal load of cooling water was 44,3 TWh.	14.1
	» Radioactive emissions to air and water are kept clearly below authority limits (continual).	» Radioactive emissions were clearly below authority limits.	14.1 15.5
	» **0 environmental accidents** (in the serious/significant category) annually.	» There were 0 environmental accidents.	15.5
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.	» The amount of produced electricity with respect to the surface area of Olkiluoto's built environment was 14,512 GWh/km².	15.1
	» At least **one voluntary project** promoting biodiversity carried out annually.	» Preparations were made during the year for establishing a new natural meadow at Olkiluoto in 2023.	15.1
Circular economy	» 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.	» Approximately 64% of waste was recycled as material. » There was 0 kg of landfill waste.	15.5
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.	» One location reviews were carried out, and plant measurements were performed at the OL1 and OL2 plant units after the annual outages.	7.3

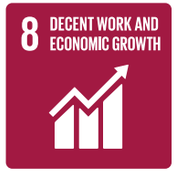
HIGH-CLASS SAFETY CULTURE

THEME	TARGET	ACTUAL RESULT 2023	SDG
Safety culture	» **No deficiencies** in IAEA's safety culture levels 1 and 2 (continual).	» One incident challenging the level of safety culture occurred relating deviation from the minimum staffing requirement for the operating shift.	8.8
Occupational health & safety	» **No serious accidents** in the TVO Group, including contractors (continual).	» There were no serious accidents.	8.8
	» The TVO Group's accident frequency (accidents per one million working hours) **below 1**, including contractors, by 2030.	» The accident frequency was 3.8 accidents per one million working hours.	8.8
Radiation protection	» Individual radiation doses incurred in Olkiluoto **below half of authority limit** (continual).	» The highest annual individual dose was 5.6 mSv. (authority limit: 20 mSv).	8.8
Plant safety	» **No events at INES 1** or higher (continual).	» There were two INES 1 events at the Olkiluoto power plant.	8.8

ADDED ECONOMIC VALUE

THEME	TARGET	ACTUAL RESULT 2023	SDG
Customer oriented & competitive activities	» The load factor of the Olkiluoto 1 and 2 plant units is **90–95%** as a rolling three-year average (continual).	» The rolling three-year average of the load factor was 93.1%.	8.1
	» The rolling three-year production cost average is below 20 €/MWh in 2023. Calculating from OL3's first full production year, the rolling three-year average is below 30 €/MWh. Reported for the first time in 2026.	» The rolling three-year average of the production cost was 21.96 €/MWh.	8.1
Nuclear power as a desired production form	» Reputation index **over 75** (excellent) in the stakeholder survey (continual).	» The reputation index in the latest stakeholder survey (2023) was 84 (excellent).	8.8
Funds ready for final disposal	» The necessary funds for final disposal are secured through payments to the Finnish State Nuclear Waste Management Fund (continual).	» TVO's liability for nuclear waste management in the Finnish State Nuclear Waste Management Fund was EUR 1,918 million for the end of 2023.	8.2

WELL-BEING OF EMPLOYEES & STRONG NETWORKS

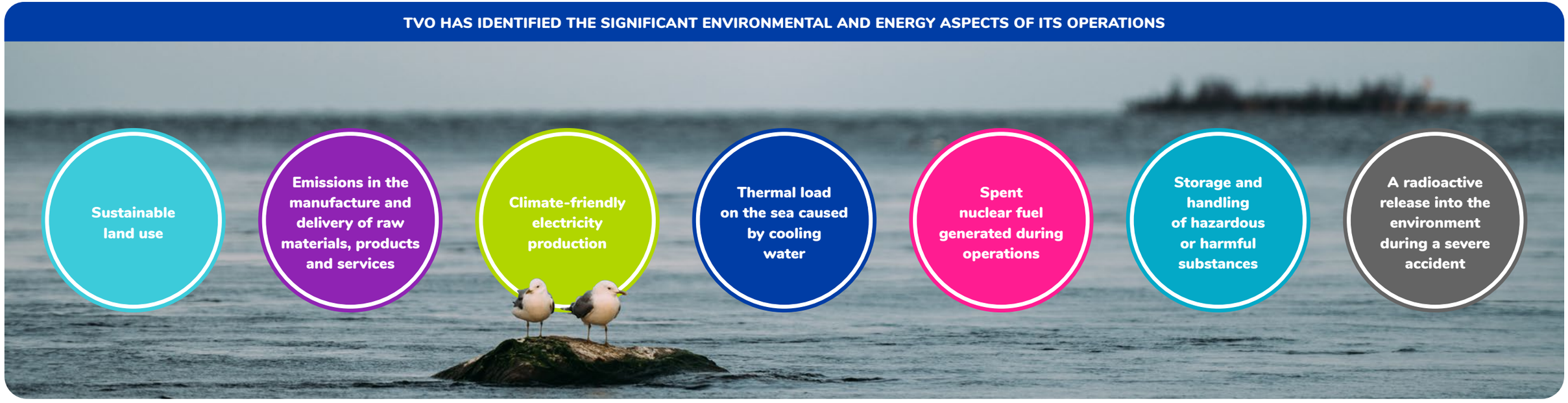


THEME	TARGET	ACTUAL RESULT 2023	SDG
Occupational health	» Personnel survey (People Power Index) result at level AA (good) achieved by 2025.	» In the latest personnel survey (2023), the People Power Index was at level A (satisfactory).	8.8
	» Sick leaves (% of working time) **below 3%** annually.	» TVO's sick leaves were 2.8% and Posiva's were 1.5%.	8.8
	» Employees' pension insurance (TyEL) category **below 4** (continual).	» The employees' pension insurance category was 2 for TVO and 1 for Posiva.	8.8
High-class expertise	» Actualisation rate of competence surveying **over 90%** annually.	» The actualisation rate of competence surveying was 74%.	8.5
	» Inspection rate of individual training plans **over 90%** annually.	» The inspection rate of individual training plans was 83%.	8.5
Professional development	» Employees' changes in position **over 5%** annually.	» 8.1% of the Group's permanent employees changed positions. The figure includes only actual changes in assignments within the Group.	8.5
	» Actualisation rate of navigation discussions **over 90%** annually.	» 98% of Group employees took part in at least one navigation discussion.	8.5
Employer role	» Recruiting over **100 students** for internships annually.	» The TVO Group employed a total of 101 trainees during the year.	8.5
Responsible supply chain	» All suppliers of raw uranium and its conversion services are evaluated every 3–5 years depending on the supplier.	» 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 three fuel factories, as well as one subcontractor of a fuel manufacturer and one component factory.	8.8
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).	» Trust in the TVO Group's activities was 84 (excellent), and the view on communications was 75 (excellent) in the latest stakeholder survey (2023).	8.8

TRAILBLAZER IN THE NUCLEAR INDUSTRY AND FINAL DISPOSAL

THEME	TARGET	ACTUAL RESULT 2023	SDG
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).	» The central R&D projects and cooperation partners are described in the chapter "Research and development".	9.5
Reliable use of the plant units	» **0** unplanned automatic scrams (continual).	» There was one unplanned automatic scram.	9.4
	» Annual unplanned energy unavailability factor **<0.4%** (1.5 days/year) of total production of OL1 and OL2 by 2024.	» The unplanned energy unavailability factor was 2.9%	9.4
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).	» Posiva's employees had 5.6 training days/employee. PSOY's turnover was EUR 4 million.	9.5

Environmental management



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.

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 the 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.

Effects of climate change on the business

Targets:

CLIMATE-FRIENDLY ELECTRICITY PRODUCTION

» In 2023, OL3 is in commercial operation, which allows for approximately 30% of the electricity consumed in Finland to be produced at Olkiluoto and for approximately 23 million tonnes of CO_2 emissions to be avoided each year (compared to coal).

EMISSIONS

» The operation of the TVO Group will be carbon neutral by 2030.

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 because nuclear power plays a significant role in the mitigation of climate change as a low-emission form of electricity production. CO_2-free electricity production and the increase in 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 section **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 the climate targets.

The TVO Group has made a strategic decision to invest in the production of clean electricity. This is reflected in the increase in 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 per cent 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 SSP (Shared Socioeconomial Pathways) 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 safety 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 brought about by climate change without compromising on 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 TVO 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. **40**).

Furthermore, an 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

Teollisuuden Voima GHG emissions, t CO_2eq	2023	2022
Scope 1	1,976	2,421
Scope 2	34,559	63,843
Scope 3	79,221	92,707

Posiva GHG emissions, t CO_2eq	2023	2022
Scope 1	361	655
Scope 2	3,429	1,792
Scope 3	10,069	24,463

READ MORE ON TCFD REPORTING:
www.fsb-tcfd.org

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

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.

The objective of the TVO Group is that key stakeholders feel that the TVO Group's operations can be trusted and that the Group is transparently communicating about its operations. The target is for the trust and transparency indicators in the stakeholder survey to be above 75, which indicates an excellent level. In the stakeholder survey carried out in late 2023, these indicators were reached excellently. The stakeholder survey is carried out every other year.

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 life cycle 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. TVO is a member of 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 2023, a dedicated stakeholder event was also held at SuomiAreena to commemorate the start of regular electricity production at OL3. In addition to SuomiAreena, there were open coffee and chat events at three market squares in the local region. In autumn 2023, the TVO Group also arranged an extensive stakeholder event called "Pure Energy" to commemorate the completion of Olkiluoto 3; the event featured international invited guests.

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. TVO also serves the media without unnecessary delays in accordance with its communication policy. During 2023, the number of media interviews provided by TVO was estimated to exceed one thousand. In 2023, TVO received no expressions of concern related to environmental issues from external sources.

The Olkiluoto Visitor Centre has normally received some 13,000–15,000 visitors each year. The visitors are openly told about the TVO Group's operations and their questions are answered. In 2023, interest towards operations at Olkiluoto grew especially.

The traditional collaboration with schools continued normally. 5th, 7th, 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 as usual.

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

Targets:

STAKEHOLDER COOPERATION

» Key stakeholders feel that the TVO Group's operations can be trusted and that the Group is transparently communicating about its operations. The trust and transparency indicators in the stakeholder survey are above 75, which indicates an excellent level.

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.

TVO's most significant international memberships are those in Nuclearеurope, 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

The Visitor Centre at Olkiluoto welcomed a total of more than 17,000 guests. Visitor activity was exceptionally high due to the completion of OL3.

Digital visits, which were started during the COVID-19 pandemic, have remained a part of the other visitor activities. Digital visits are particularly useful for groups that would need to travel a longer distance to Olkiluoto. In 2023, a total of more than 1,000 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 to everyone.

THE MOST IMPORTANT SPONSORSHIP RECIPIENTS IN 2023 WERE:

- Rauman Lukko (ice hockey; representative team and juniors)
- Pallo-Iirot (football; representative team, 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 communities 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.

CASE

Head of Visits Mika Tanhuanpää:

"Olkiluoto attracted more interest than ever before

Mika Tanhuanpää, who has worked as the Head of Visits in Olkiluoto for the past decade, says that summer 2023 was busier than any summer before.

- Similar figures were last recorded at the turn of the millennium. But whereas then people were tempted here with large campaigns and by offering free rides, this year they found their way to Olkiluoto without any of those, Tanhuanpää tells.

Olkiluoto has been very strongly a point of interest with the long-awaited start of the OL3 plant unit. And electricity production as a whole has increased in significance in recent times.

- The truth is that due to the difficult winter of 2023, Finnish people are perhaps more interested in matters related to electricity than ever before.

In addition to visits, the tradition of cooperation with schools in Eurajoki continued with students from grades 5, 7, 8 and 9 as well as secondary senior school. More than 85 children participated in the long-standing science camps designed for children from lower grades.

Olkiluoto was also visible in both national and international media. In 2023, an estimated number of more than one thousand interviews were given from TVO to the media.

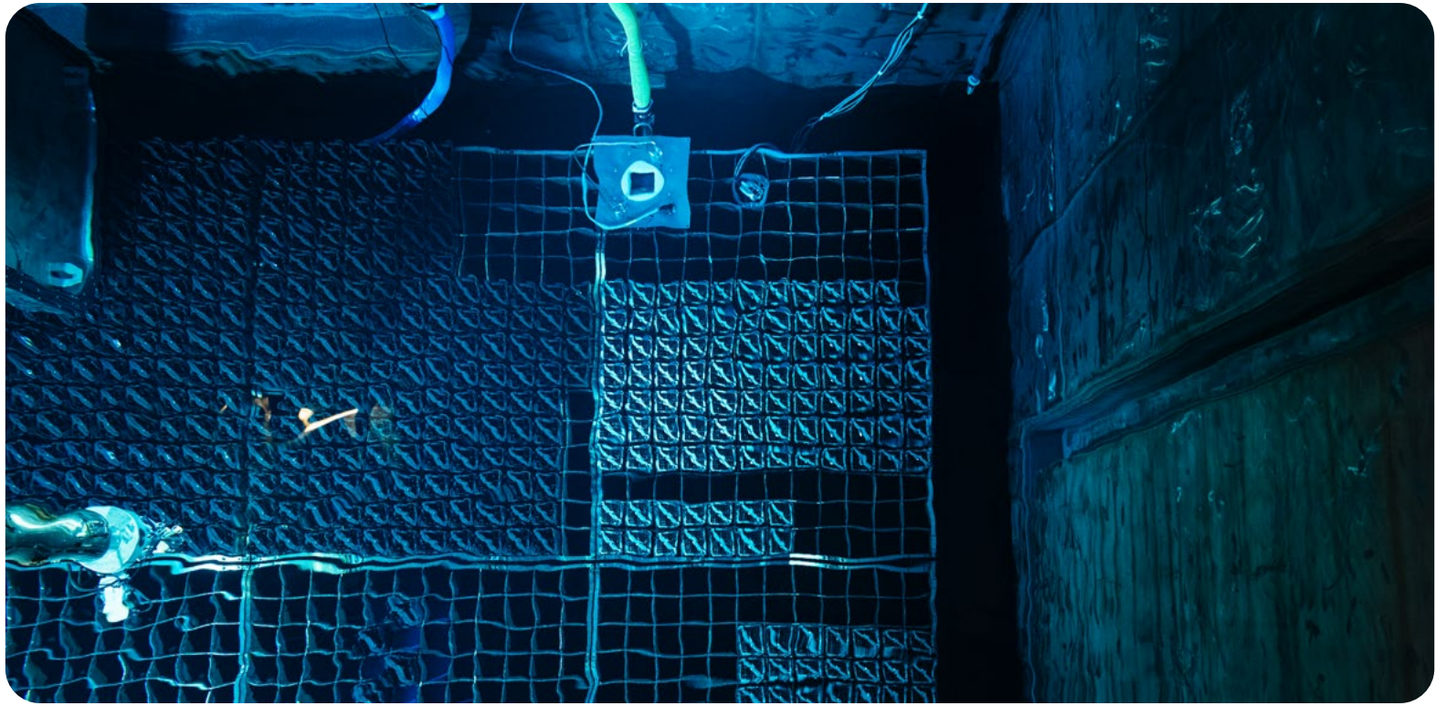
Follow us on social media:

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.

The TVO Group only purchases products and services from suppliers it has evaluated and approved. 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.



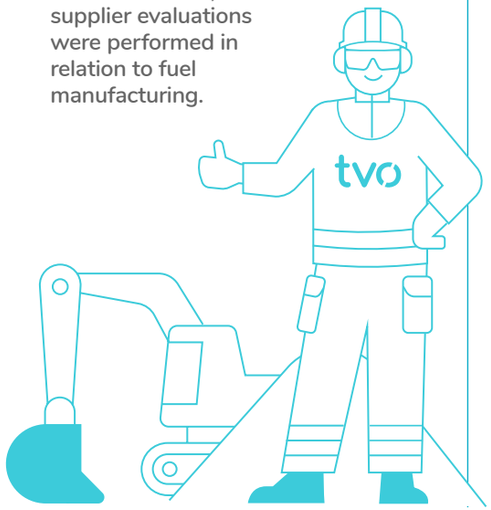
Audits – a quality assurance method

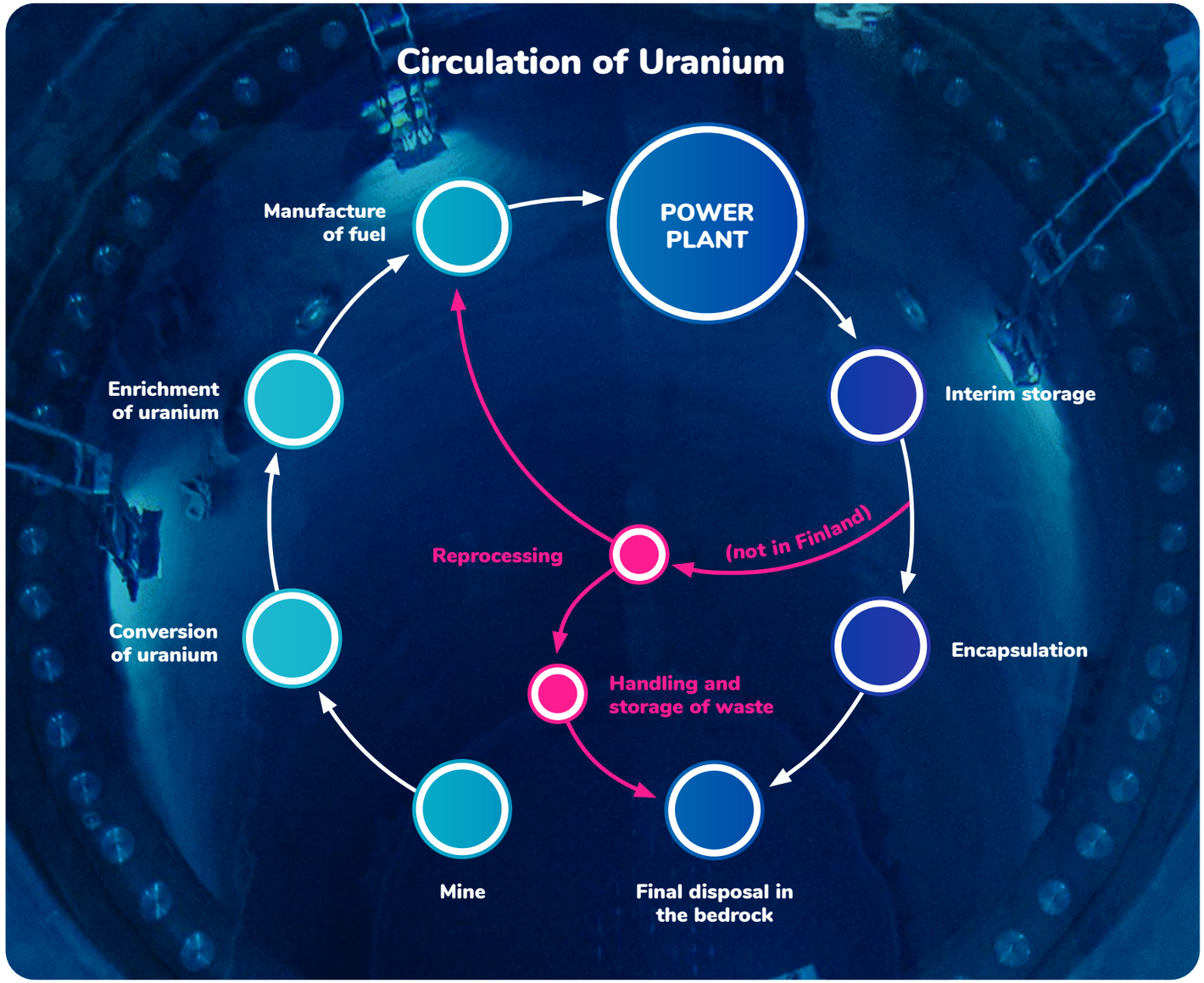
The TVO Group's suppliers generally apply a level of requirements in accordance with the ISO 9001 quality management system, ISO 14001 environmental management system and the ISO 45001 occupational health and safety system (OHS). Auditing is one of the quality assurance methods used. The audits may be 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

Targets:

RESPONSIBLE PROCUREMENT CHAIN

- All suppliers of raw uranium and its refining services in TVO's procurement chain are assessed every 3–5 years, depending on the supplier and the previous assessment.
- In 2023, two supplier evaluations were performed regarding the procurement of raw uranium and its refining stages (conversion and enrichment). Five supplier evaluations were performed in relation to fuel manufacturing.





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 supplier 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.

The largest uranium producers in the world are Canada, Australia, and Kazakhstan. A significant portion of TVO's uranium comes from these major producing countries. The fuel assemblies commissioned by the company are manufactured and assembled in Germany, France, 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 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 responsibility 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

Research and development

Targets:

RESEARCH & DEVELOPMENT

» R&D activities develop the safety of the plant and nuclear waste management as well as business and future technological solutions with the support of networks and research projects.

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 low and intermediate-level nuclear waste 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 within the nuclear energy industry.

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 goal is also to work in an agile manner, offering other organisations opportunities for testing new ideas by utilising external cooperation networks if necessary.

Actions are guided by the following objectives:

» **Economy:** Ensuring an operating life of 60 years for the plant units, a 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 by supporting the company's financial goals and the safe operation of the plants.

The total R&D expenses in 2023 were EUR 16 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 and nuclear waste management (SAFER2028). In 2023, TVO paid a total of EUR 6 million in research-fund-related contributions to the Finnish State Nuclear Waste Management Fund.

Significant developer of the nuclear sector

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

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
» Capasity increases
» New methods and procedures

goals of plant technology research and research into nuclear waste management.

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

In 2023, TVO was engaged in the following research projects, among others:

SMR2029

TVO is preparing for a paradigm shift in the field of energy and surveying new areas of business that can offer added value for TVO's shareholders. In the SMR2029 project, TVO has spent three years performing a comprehensive analysis of Small Modular Reactors (SMRs) and questions related to them, in terms of technology, licensing, location, fuel, waste management, financial profitability and general prerequisites, such as acceptability and need. The project has also promoted the development of the operating environment by participating in the national EcoSMR project and contributing TVO's views to the total reform of the Nuclear Energy Act and STUK's regulatory reform.

The development of SMRs has advanced significantly during the past three years, as regards several technologies. In late 2023, an SMR preparation stage was launched; its goals include determining suitable locations for SMR plants, identifying a suitable form of production and its related technologies and starting cooperation with plant suppliers.

SERVICE LIFE MANAGEMENT

In year 2023 TVO started a project where the COMSOL modelling software is used to model ageing mechanisms and estimate the remaining service life of electrical and I&C components at a nuclear power plant. The scope of the project covers safety-classified components and single points of vulnerability. Results from the research will support the service life management and maintenance of a nuclear power plant; in particular, the scheduling of equipment replacements and understanding of ageing and failure mechanisms.

TVO has an ongoing 3D project where the goal is to make an additive manufacturing method, also known as 3D printing, one of the tools for manufacturing spare parts for nuclear power plants. The aim is to use 3D printing primarily for securing the availability of spare parts that are otherwise not commercially available. Printing also provides specific benefits in cases where defective components can be repaired by, for example, replacing their internals with a printed part.

3D printing allows for manufacturing parts from polymers and metal using various methods. For example, the alarm signs in the OL1/OL2 main control rooms were manufactured from nylon using Selective Laser Sintering (SLS), and terminal isolation pieces were made from PA12 powder as part of the 3D project. On the metals side, a valve body was manufactured from austenitic stainless steel (316L) using the laser-based powder bed fusion (L-PBF) method in a collaborative project with Fortum and Neles Oy. Westinghouse has also used the same material and method to manufacture the FME screens that are in use on OL2 fuel assemblies. The 3D project also carries out research, such as stress corrosion testing of samples manufactured with the L-PBF method, and participates in ongoing research projects in the nuclear power industry, such as Nuclear Component Based on Additive Manufacturing (Nucobam) and SAFER2028.

TVO's concrete studies aim at determining the current condition of the so-called critical nuclear power plant buildings and structural components using advanced research methods and deciding on any further actions that may be required. If necessary, further studies or action proposals will be drawn up for launching modifications and projects. TVO also monitors and participates in national and international research and development projects, such as ENERGIFORSK concrete, SAFER concrete projects, ACES concrete as End-User, FROG containment, VERCORS test containment benchmark and OECD/WGIAGE Concrete. Slightly less than one million cubic metres of concrete structures have been cast on Olkiluoto Island.

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 which require 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.

€16 million

The total R&D expenses in 2023.

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 that are submitted to STUK for approval every 15 years; as regards bedrock, this requires information regarding the geology of the nearby rock, hydrogeology and groundwater chemistry. Furthermore, various material sample studies, such as a gas generation test, disassembly waste metal studies and concrete dilution studies, have been carried out inside the VLJ repository.

Cooperation and networking

TVO's R&D is comprehensively involved in national 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, University of Helsinki, Aalto University and Tampere University. International cooperation at the Nordic level mostly takes place via the Energiforsk research programme and the cooperation networks Nordic Nuclear Safety Research (NKS) and Nordic PSA Group (NPSAG). At the European level, cooperation has been arranged through the SNETP (Sustainable Nuclear Energy Technology Platform), The Nuclear Generation II & III Alliance (NUGENIA) and Euratom's research projects.

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:

Safety & Security

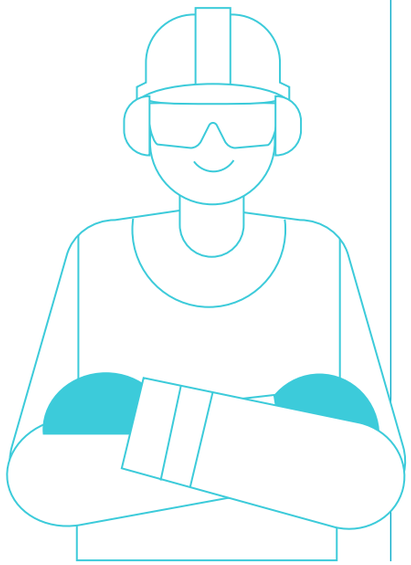
Targets:

SAFETY CULTURE

» No shortcomings at the IAEA's safety culture levels 1 and 2 (continuous).

PLANT SAFETY

» No events of INES level 1 or higher (continuous).



The safe operation of the Olkiluoto nuclear power plant relies on competent and responsible personnel, high-quality plant technology, the principle of continuous improvement and independent internal and external supervision. TVO's activity-based 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.

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 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.

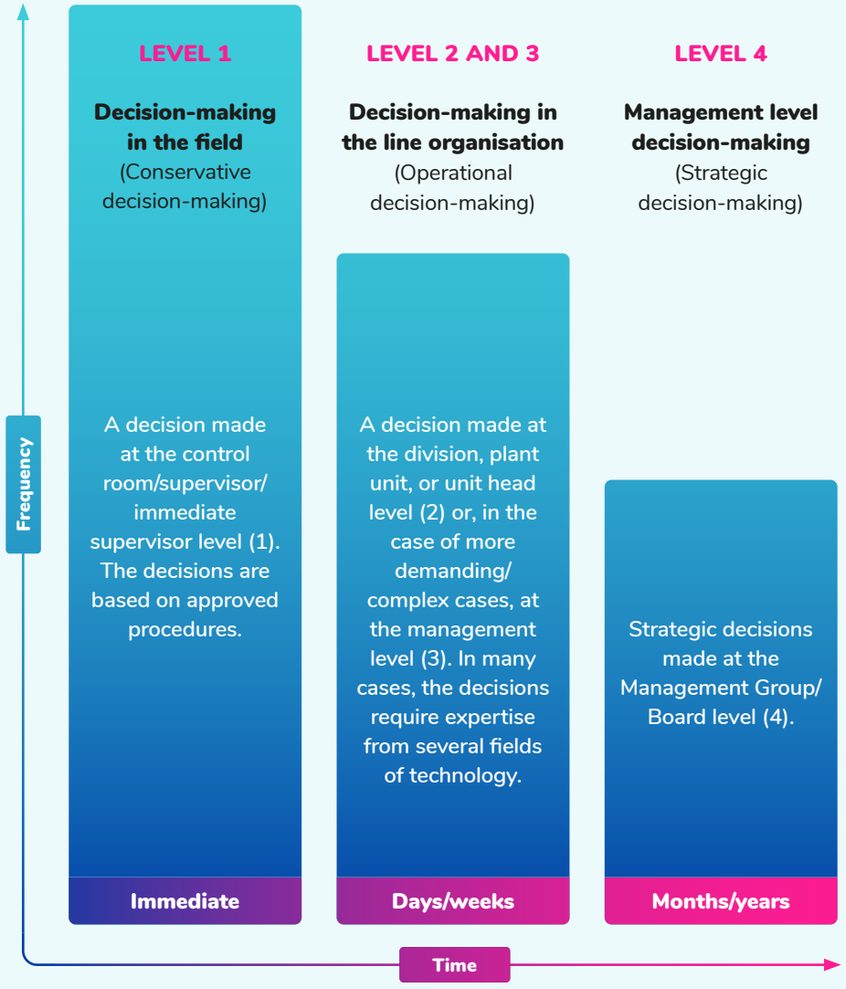
The state of the safety culture is regularly assessed according to the IAEA's procedures. TVO's safety culture is estimated to be at a level where the strategic importance of safety has been recognised and proactive practices are employed. TVO aims to reach the highest possible level of safety culture.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

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. 15).

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 2023, 10 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 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 service outages at the plant units.

The 2023 annual outages of the Olkiluoto nuclear power plant were started with a refuelling outage at the OL1 plant unit on 16 April. The refuelling outage was completed on 26 May. In addition to refuelling, annually occurring preventive maintenance and testing took place during OL1's annual outage. The most significant individual jobs included the replacement of a SIRM detector and its protective tube, the modernisation of a turbine hall crane and a turbine oil change.

The annual outage for OL2 was a service outage that started on 1 May and ended on 19 May. Major modifications during the service outage included turbine I&C renovation, replacement of the containment's electrical penetrations, modification of the reactor water level measurement and the replacement of the off-gas venting system emergency fans.

No lost-time occupational accidents occurred during the annual outages.

In addition to TVO's in-house personnel, approximately 790 subcontractor employees participated in the annual outage work. Approximately 170 specialists arrived from abroad for the annual outages.

Information security and cybersecurity

Information security and cybersecurity are parts of TVO's safety culture. The Information Security function closely cooperates with all parts of the organisation, ensuring the updated protection of both administrative and production-related information systems against various threats. The preparation involves collaboration and regular exchange of information with authorities as well as other actors critical in terms of the security of supply and our collaboration partners.

An important part of maintaining information security and cybersecurity is the continuous training of personnel and adding to their knowledge, which allows every employee to identify information security risks, react to them as well as detect and report information security deviations. Systematic drills are arranged to prepare for information security and cybersecurity threats. In 2023, TVO arranged one in-house cybersecurity drill and participated in the national Taisto exercise and the international Nordic Pine exercise.

TVO has also identified information security and cybersecurity risks as part of risk management and through internal and external assessments. Actions have also been defined for information security and cybersecurity as part of the development programme for Corporate Safety & Security. The goal is to achieve an information security management model pursuant to the ISO/IEC 27001 standard.

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 and Posiva also utilises a proactive safety observation procedure to prevent environmental damage. A total of 104 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 2023, a total of 12 litres of oil were 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 equipment. 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 during incidents and operational occurrences. 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 2023, including emergency preparedness exercises and joint exercises with the fire brigade and the security organisation. In 2023, the emergency preparedness exercises involved rehearsing radiation measurements in the Olkiluoto area in cooperation between various authorities as well as communication under exceptional circumstances; cooperation between various roles and actors was the focus area of the exercises.

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.

Emergency exercises are arranged regularly each year.

Safety culture

All of 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 by 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-based 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 professionalism and leadership are systematically developed at the TVO Group. The Nuclear Professionalism Group is tasked with developing nuclear professionalism and thinking of ways in which human factors could be considered in the everyday work even better. The group's long-term plan takes into account the areas for improvement and leverages the entire organisation to work towards them. In 2023, for example, the organisation had extensive discussions on safety culture based on WANO's educational narrative concerning safety culture. Nuclear professionalism is also developed in connection with regular plant walkdowns.

Development of leadership is also performed systematically. Annually, areas for improvement are identified on the basis of international peer reviews, self-assessments and the needs of the organisation. Development in 2023 was related to the leadership of cross-organisational processes and harmonising practices across the three plant units.

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 generates low carbon dioxide emissions. Over the entire life cycle 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 EU aims at reducing greenhouse gas emissions by at least 55 per cent by 2030 (compared to 1990 levels) so that the EU's target for carbon neutrality by 2050 can be reached. As a low-emission form of electricity production, nuclear power has a significant role in achieving these goals.

According to the Finnish Government's programme (2023), the government is committed to meeting the targets for emission reductions and advancing to the carbon neutrality target and, from there, to carbon negativity. The government states that more nuclear power is required in Finland.

In this chapter:

The environmental impacts of nuclear power

The production of nuclear power generates low carbon dioxide emissions – over the entire life cycle 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 as well as 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 countries, approximately 580 million tonnes of CO_2 emissions are avoided annually, of which Finland's share accounts for 27 million tonnes.

Over the course of its entire history, the Olkiluoto nuclear power plant has generated more than 580 TWh of electricity. This production volume has prevented greenhouse gas emissions of more than 455 million tonnes. This corresponds to all the greenhouse gas emissions in Finland during a period of approximately 9 years if nuclear power were replaced with condensing coal power, the specific emissions of which amount to 820 g/kWh.

Supply of electricity in Finland and its climate impact

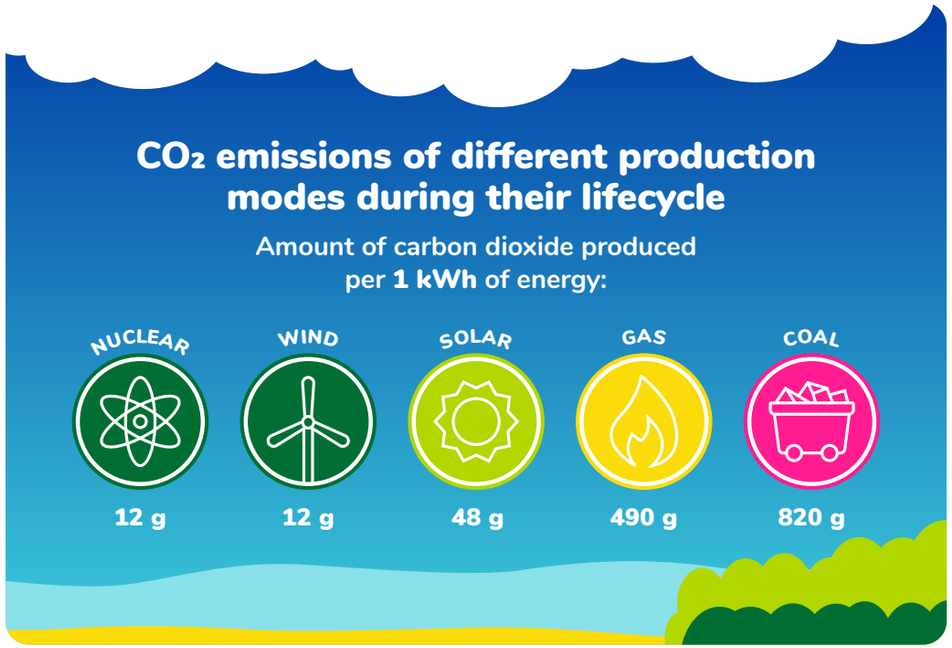
The volume of electricity production at Olkiluoto will be nearly doubled when the OL3 plant unit starts regular electricity production. This means that the low-emission nuclear electricity produced at Olkiluoto will play a significant role in the economic development, electricity self-sufficiency and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

In 2023, the share of nuclear power was about 41 per cent of all the electricity produced in Finland. In total, Olkiluoto generated approximately 31 per cent of all electricity produced in Finland and about one-fifth of all electricity consumed in Finland in 2023.

Electricity in every weather

The electrification of society and phasing out of fossil fuels will require increasingly larger amounts of emission-free electricity. 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 the renewable energy production forms in the electricity system.

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



CASE

Olkiluoto 3 has a major impact on stabilising the availability and price of electricity

The completion of Olkiluoto 3 (OL3) has made Finland more self-sufficient in terms of electricity and reduced its emissions. Similarly to all nuclear power generation, OL3 has also had a stabilising impact on price.

The 1,600 megawatts generated by OL3 is a massive amount, which equals 14% of all the electricity produced in Finland. And, since the same plant site is also home to the OL1 and OL2 plant units, Olkiluoto generated 31% of all electricity consumed in Finland last year.

The changing geopolitical situation certainly did nothing to reduce the significance of OL3. The war in Ukraine impacted energy markets across Europe, and Finland also faced an entirely new situation. Change has been rapid, since approximately 9.1 TWh were still being imported from Russia in 2021. This amounted to approximately 10% of the consumption in Finland. This capacity has now been successfully replaced by clean, domestic production.

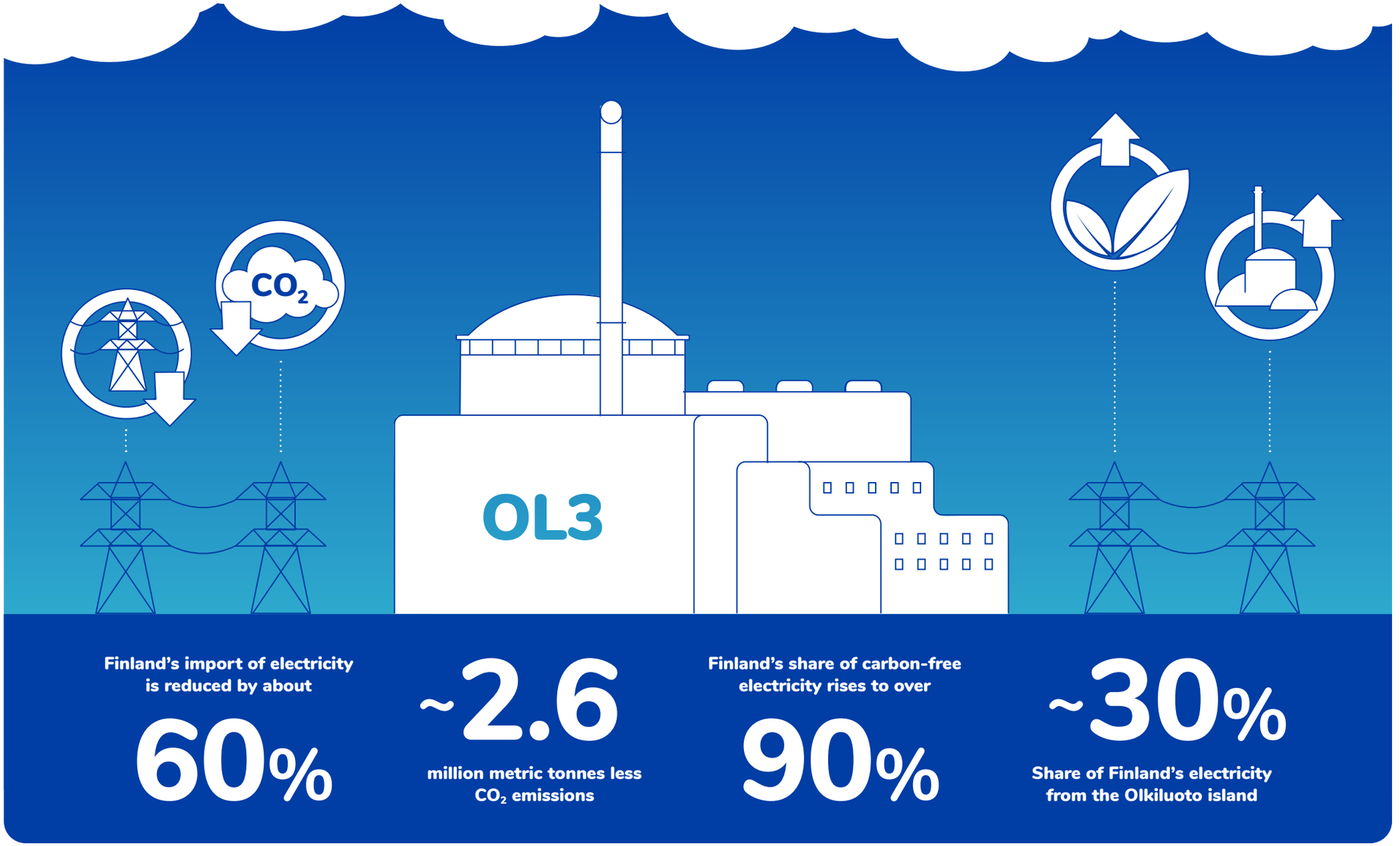
OL3 gave the green transition a major push forward. 94% of all the electricity produced last year in Finland was emissions-free. Increasing domestic production also affected the price of electricity. Finland had the second cheapest electricity in Europe last year, with Sweden being the cheapest.

Finland's greatest climate act

Regular electricity production at the OL3 plant unit, the single greatest climate act in Finland, started on 16 April 2023. With this third most powerful nuclear power unit in the world, approximately 30 per cent of Finland's electricity can be produced on one island, where the entire life cycle of nuclear power is managed.

By replacing the average electricity production carbon dioxide emissions in EU-27 countries, OL3's production reduces annual carbon dioxide emissions by approximately 2.6 million tonnes. Simultaneously, Finland's self-sufficiency in clean electricity grows – the share of zero-emission electricity production will rise from 89 per cent to approximately 92 per cent. OL3's electricity production will reduce the import of electricity by approximately 60 per cent.

The commissioning of OL3 can be seen in some of the environmental indicators for 2023.



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. The Group has set a carbon neutrality target. Environmental research has been conducted on 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 its personnel and other persons working at the Olkiluoto nuclear facilities have competence and expertise in matters related to the environment and energy efficiency.

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 of the Olkiluoto nuclear power plant is to prevent and further reduce conventional emissions and 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 by considering circular economy in their operations. 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 and biodiversity are 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-third of all the electricity in Finland. The concentration of energy production in a small geographic area minimises the environmental impact and allows for 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 climate-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 2023, the focus for the targets was the introduction in the field of the environmental procedures used for projects and modifications and the supervision of adherence to them. Long-term efforts in the management of radioactive releases and the thermal load of the cooling water were also continued at the power plant.

In 2023, the operations at the Olkiluoto nuclear power plant and Posiva's spent nuclear fuel 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 modifications at the debris handling building for OL1 and OL2 were completed by the end of June. Temporary bypasses occurred at the plant during the autumn, but for the rest of the year, debris handling was implemented according to the provisions of the environmental permit. The impacts on water systems of the debris handling bypasses have been monitored according to a plan approved by the authority, and the results will be reported during spring 2024.

UN Sustainable Development Goals:

Through its actions, the TVO Group is also committed to promoting the following environment-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 climate-friendly electricity production, and the most significant impact is the local warming of the seawater near the plant. During the reporting period, 24.67 TWh of electricity was generated. The cooling water temperature remained within the limits required by the environmental permit. Radioactive releases into the air and water from the nuclear power plant were extremely low. The commissioning of OL3 created temporary environmental effects, such as nitrogen releases that were higher than estimated.

"Electricity produced during the reporting period was **24.67 TWh**, and the cooling water temperature remained within the limits required by the environmental permit."

Environmental balance sheet

EMISSIONS TO THE AIR

		ALLOWED ANNUAL EMISSIONS
Noble gases	1.61 TBq [Kr-87 eq]	10,470 TBq
Iodine	0.00003 TBq [I-131 eq]	0.114 TBq
Aerosols	0.004 TBq	
Carbon-14	0.69 TBq	
Tritium	0.48 TBq	

GHG emissions Scope 1	1,976 t CO_2eq
GHG emissions Scope 2	34,559 t CO_2eq
GHG emissions Scope 3	79,221 t CO_2eq
NOx	2.0 t
SOx	0.0 t
Particles	0.1 t

WATER

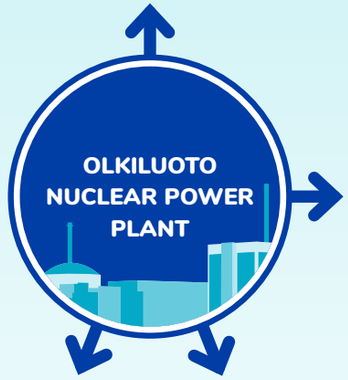
Cooling water	3,706 million m³
Tap and process water	279,633 m³

INTERMEDIATE AGENTS

Oils	699 m³
NaClO (15%)	43 m³
Other chemicals	311 t
Ion exchange resins	15 t
Water treatment chemicals	100 t

OL1/OL2 URANIUM FUEL **33.31** t

OL3 URANIUM FUEL **0.0*** t



ELECTRICITY **24.67** TWh

MUNICIPAL WASTE

	Total
Recyclable waste	2,578 t
Landfill waste	0 t
Hazardous waste	242 t**

** Includes hazardous waste recycled as material 74 t

RADIOACTIVE WASTE

	Total
Low-level waste placed in the VLJ repository	17 m³
Intermediate level waste placed in the VLJ repository	64 m³
Spent nuclear fuel	33.90 t

EMISSIONS TO THE WATER

		ALLOWED ANNUAL EMISSIONS
Thermal load to the sea	44.3 TWh	56.9 TWh
Fission and activation products	0.0002 TBq	0.336 TBq
Tritium	22.8 TBq	78.30 TBq
Phosphorus	28 kg	
Nitrogen	2,555 kg	
BOD_{7ATU}	1,351 kg	

EMISSIONS TO THE SOIL

Oil	approximately 12 l (soil decontamined)

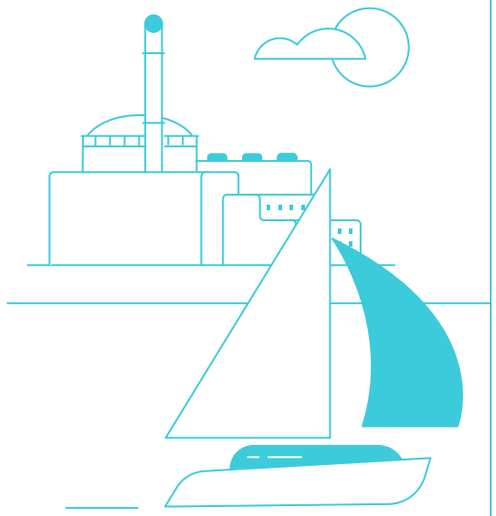
* Fuel was not loaded at OL3 during the year.

Cooling water

Targets:

EMISSIONS

» Maximum thermal load caused by cooling water 56.9 TWh per year.



The warming of the seawater due to the thermal load from the cooling water is the most important adverse 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 2023, 3,706 million cubic metres of seawater were used for cooling, and the resulting thermal load on the sea was 44.3 TWh. Seawater temperature is monitored as required by the environmental permit. The permit states that the seawater temperature must not exceed the target value of 30°C when measured as a weekly rolling average at a distance of 500 metres from the cooling water discharge channel. Limit values have also been specified for the amount of cooling water (max. 4,415 million m³) and the thermal load (max. 56.9 TWh) in the environmental permit. None of the permit limits were exceeded in 2023.

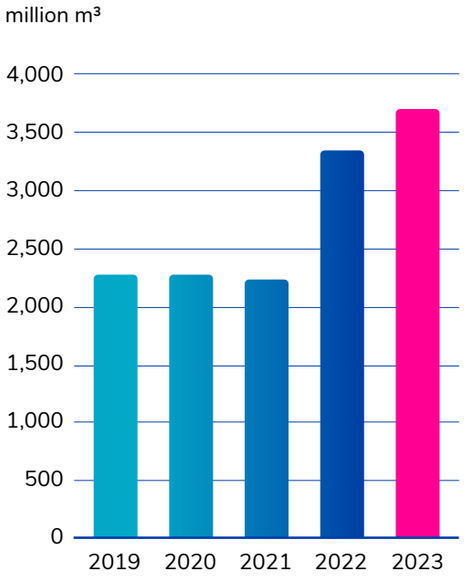
As the cooling water passes through the plant, its temperature increases by approximately 10°C, after which it mixes with seawater. The cooling water does not come into direct contact with the power plant's process water. Throughout the operation of the power plant, TVO has monitored the impact of cooling water and conducted related surveys. The cooling water accumulates in an extensive sea area in the surface layer, from where part of the heat transfers into the air. Depending on the weather conditions, an increase in temperature can be observed at an approximate distance of 3–5 kilometres from the cooling water discharge location.

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

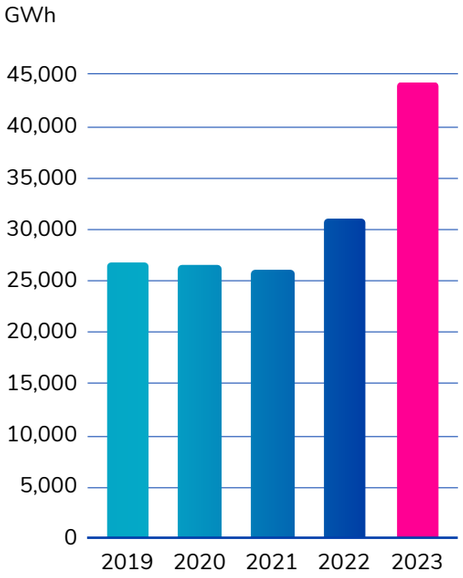
An investigation into fish and fry carried to the power plant by the cooling water was launched in spring 2023, and it will be carried out according to the surveillance plan approved by the authority.

The solid material is extracted from the cooling water at the debris handling building. During 2023, modifications were performed at the debris handling building for the OL1 and OL2 plant units. From September onwards, debris handling has been implemented according to the provisions of the environmental permit.

Water usage
Cooling water



Emissions
Thermal load on the sea



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, bitumen, nitrogen, hydrazine and ammonia water, as well as different oils used at the plant (other chemicals) are among the intermediate agents to be reported.

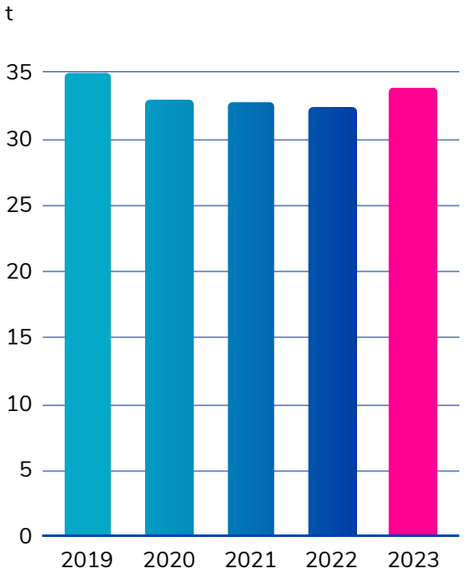
Reducing water consumption

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 and a laboratory. The tap water and process water are treated at TVO's own water treatment plant. Process water is treated using ion exchange and reverse osmosis technologies, and the water is continuously recirculated and purified. Since December 2023, municipal wastewater from Olkiluoto has been routed to Rauma for treatment via a transfer sewer.

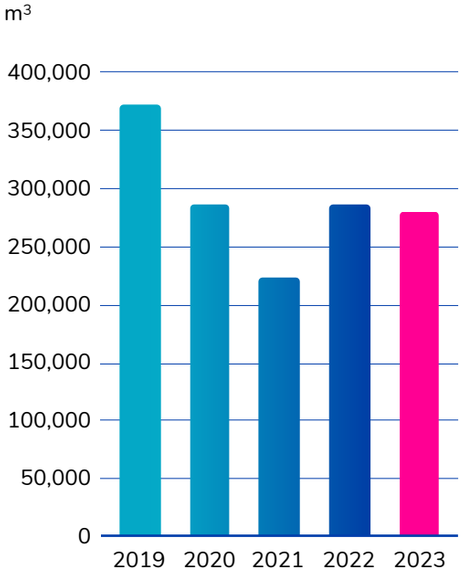
During annual outages, the fuel pool water is stored in storage pools and later reused. The recirculation of water reduces TVO's need for clean process water and the amount of process wastewater discharged from the plant by approximately 30,000 m³ each year. During the reporting year, 272,713 m³ of fresh water was taken from the Eurajoki river for use at the power plant.

TVO has in place a Water Safety Plan (WSP) for tap water that is in line with the World Health Organization's (WHO) guidelines. Its aim is to identify the risks related to the operating environment of water production and its production chain and to manage them in order to ensure water quality. Water quality at TVO meets the quality requirements set by the authorities.

Material efficiency
Nuclear fuel spent



Water usage
Untreated water



Intermediate agents	2023	2022	2021	2020	2019
Oils (m³)	699	659	1 046	748	732
NaClO (15%) (m³)	43	42	42	48	39
Other chemicals (t)	311*	194*	148	223	118
Ion exchange resins (t)	15	17	13	15	15
Water treatment chemicals (t)	100	110	112	83	104

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

Production and energy efficiency

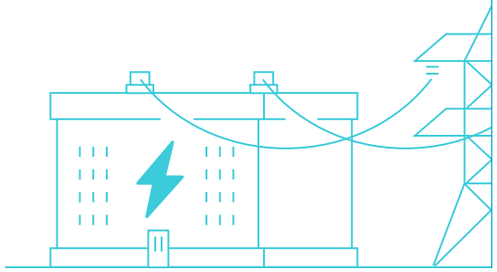
Targets:

RELIABLE USE OF THE PLANT UNITS

- 0 unplanned automatic scrams/trips (continuous).
- Annual unplanned energy unavailability <0.4% (1.5 d/a) of total production by 2024.

ENERGY EFFICIENCY

- Commitment to the goals set out in the Energy Efficiency Agreement's period for 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 at Olkiluoto.



In 2023, the combined electricity production of the Olkiluoto plant units, OL1, OL2 and OL3, was 24.67 TWh. TVO produced approximately 31 per cent of all the electricity consumed in Finland.

The plant units operated safely. The net production for OL1 was 7.42 TWh and the load factor was 95.4 per cent. The net production for OL2 was 6.87 TWh and the load factor was 88.3 per cent. The net production for OL3 was 10.37 TWh and the load factor was 73.3 per cent.

Regular electricity production at OL3 started on 16 April 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 and also reached.

The TVO Group has an Energy Efficiency Group, whose tasks include the monitoring of energy consumption, performing energy reviews and measurements at the plant and, on their basis, discovering and implementing new energy savings measures. Each year, the Energy Efficiency Group sets targets for energy savings and monitors how they are achieved.

Energy efficiency measures carried out in 2023 included switching road and yard lighting to LEDs. Furthermore, plant measurements were carried out at the OL1 and OL2 plant units and an energy review was performed at the Multi-Activity Centre. The district heating network expansion project was continued in 2023 and a project for adding remotely readable meters was launched. The project involves adding remotely readable consumption meters for electricity, water and district heating in the separate buildings. These will improve the monitoring of energy consumption.

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 Olkiluoto site. The TVO Group's environmental management system incorporates the energy efficiency system ETJ+ that is used to continuously improve energy efficiency across all functions.

OL1	2023	2022	2021	2020	2019
Net production (GWh)	7,428	6,932	7,404	7,310	7,542
Capacity factor (%)	95.4	89.1	95.1	93.7	96.9
Efficiency (net) (%)	35.5	35.6	35.6	35.5	35.5

OL2	2023	2022	2021	2020	2019
Net production (GWh)	6,871	7,532	7,033	7,277	7,209
Capacity factor (%)	88.3	96.8	90.4	93.3	92.7
Efficiency (net) (%)	35.4	35.4	35.5	35.4	35.5

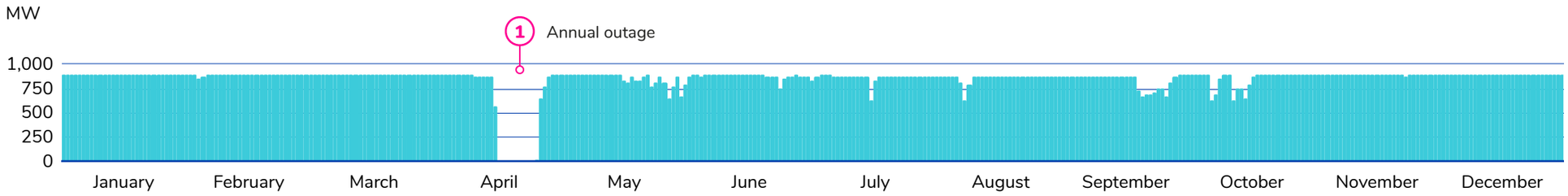
OL3	2023	2022	2021	2020	2019
Net production (GWh)	10,372	1,887	-	-	-
Capacity factor (%)	73.3	16.9	-	-	-
Efficiency (net) (%)	36.3	28.3	-	-	-

At the moment, district heating is obtained from the OL1 and OL2 plant units. It consists of waste heat from the plants. In 2023, approximately 20 GWh of heat was sent to the district network, where it is used for heating buildings. With the district heating network's expansion project, the OL3 plant unit will also be added to the district heating network.

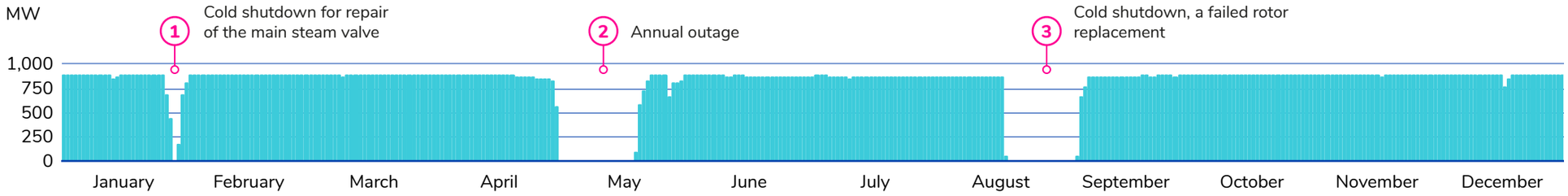
The electricity used at Olkiluoto consists of electricity produced in-house and electricity purchased from the power market. The plant units use electricity generated in their own production. Currently, electricity is purchased from the power market for the Olkiluoto outdoor areas, Posiva and the plant 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 2023, the percentages were as follows: fossil-based energy sources and peat 70.12%, nuclear power 18.20% and renewable energy sources 11.68%.

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. In 2023, total energy consumption was 1,235 GWh, of which 1,227 GWh came from electricity consumption and 7.8 GWh from fuel consumption.

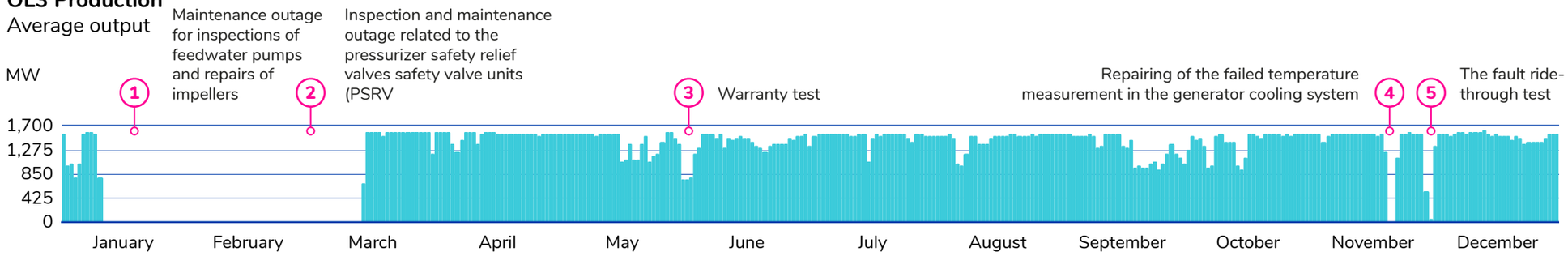
OL1 Production
Average output

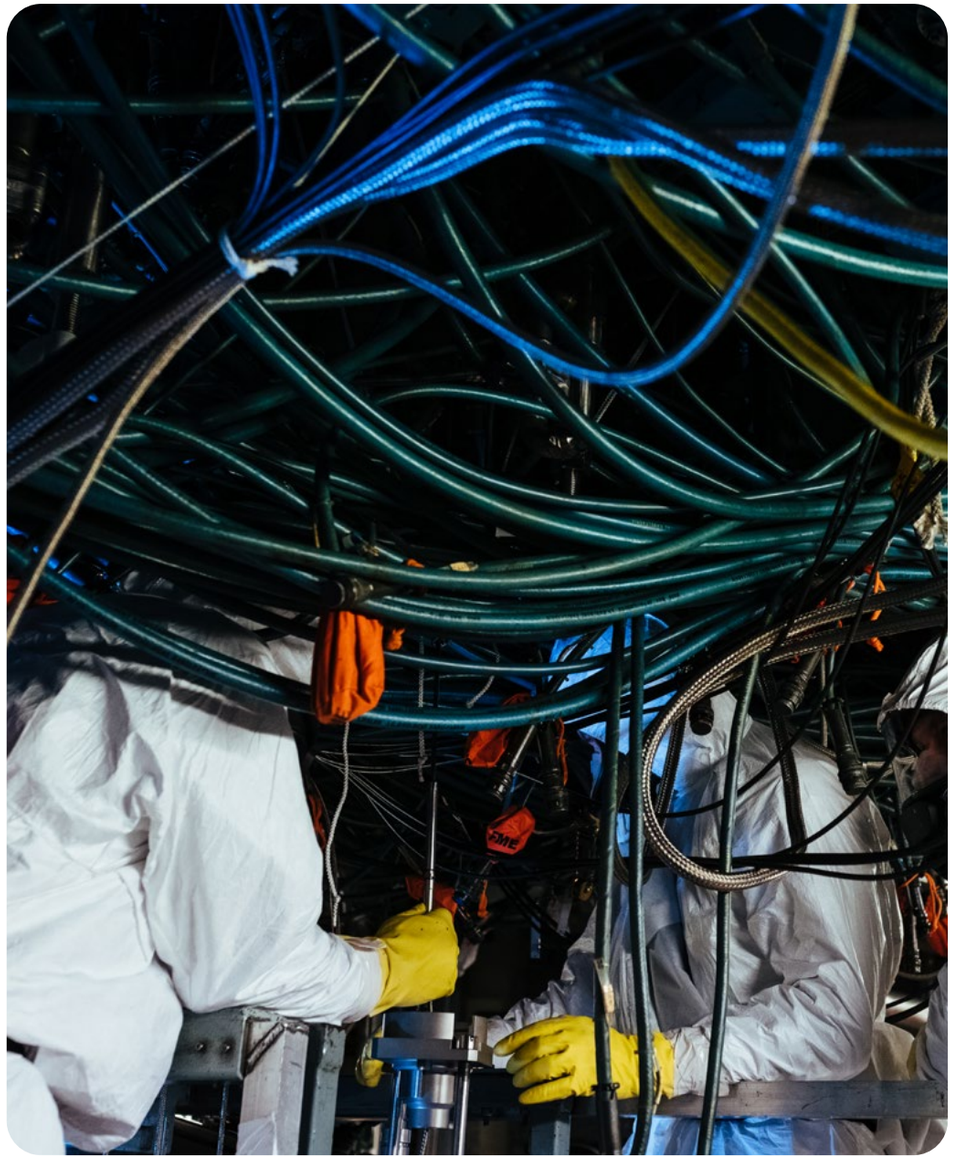


OL2 Production
Average output

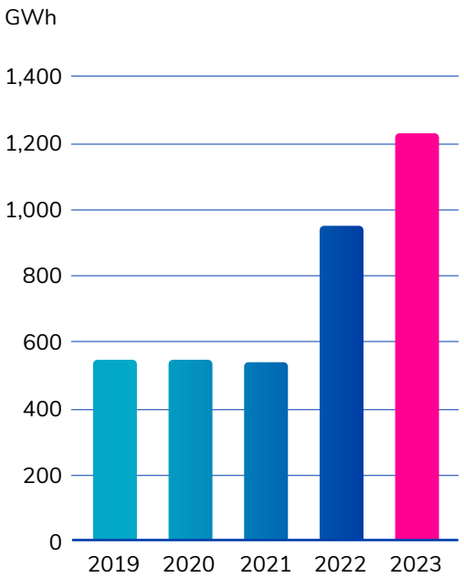


OL3 Production
Average output





Energy efficiency
TVO's electricity consumption



24 GWh

district heating from the plant units to buildings in Olkiluoto.

CASE

The possible power uprating would not be the first of its kind

TVO has been systematically modernising its plant units, during annual outages and in modernisation projects. Continuous development has also made power uprating possible. Such a move is even now being considered at Olkiluoto.

In October 2023, TVO announced that it has launched the preparation of an environmental impact assessment procedure concerning the possible operating licence extension for the OL1 and OL2 plant units by either 10 or 20 years.

At the same time, opportunities to uprate the power of the plant units are being investigated. An uprating of 80 MW is being considered for both plant units, bringing power levels from 890 MW to approximately 970 MW.

The possible power uprating would not be the first of its kind. The OL1 and OL2 plant units originally operated at an output of 660 MW.

Annual outages are a key part of the long-term life cycle management of the plants. Each annual outage includes replacing some of the uranium fuel, carrying out the necessary repairs and maintenance and implementing any scheduled modifications. In addition, possible preparatory work for the following year's service outage is carried out. The power uprating that is now being considered would also be mostly implemented during the annual outages of the plant units.

Read more in Finnish on **tvo.fi**

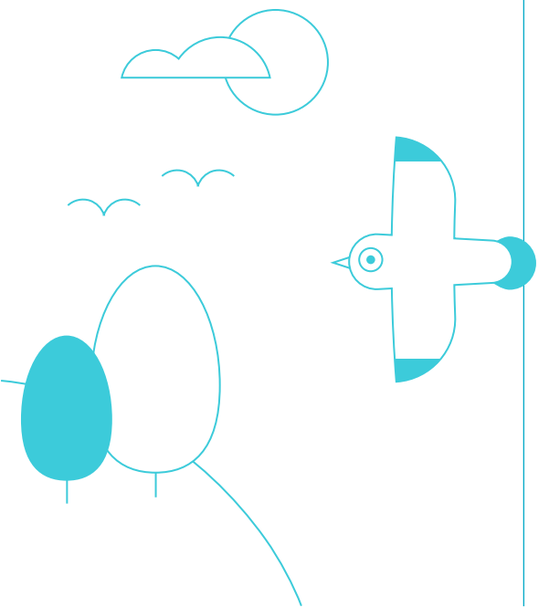
Releases into the air

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.

Targets:

EMISSIONS

» Radioactive releases into the air are kept clearly below authority limits (continuous). TVO's own emissions targets are presented in the ALARA programme.



Radioactive releases into the air

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

The theoretical radiation dose caused to neighbouring residents at Olkiluoto is estimated to remain clearly below the threshold value. In 2022, the radiation dose was 0.23 µSv (threshold value: 100 µSv). TVO's target value is below 0.8 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 the CO_2 reduction goals. Posiva also plays an important role in the mitigation of climate change, since the final disposal solution is a part of the life cycle of nuclear power.

The power plant's verified CO_2 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 into the atmosphere. The largest modernisation project in the history of the plant units reached a milestone in the summer of 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. Five emergency diesel generators had been replaced by the end of 2023.

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 (Greenhouse Gas) 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 TVO Group continued the calculation of Scope 3 emissions in 2023. Scope 3 emissions include indirect emissions connected with the Company's operations from sources which are not owned by the Company itself.

Radioactive emissions to the air	2023	2022	2021	2020	2019
Noble gas TBq (Kr-87 equivalent)	1.61	1.11	0.20	0.97	1.76
% of allowed amount	0.02	0.01	0.002	0.01	0.02
Iodine TBq (I-131)	0.00003	0.00008	0.00013	0.00012	0.0008
% of allowed amount	0.02	0.07	0.13	0.12	0.74
Aerosols TBq	0.004	0.01	0.00005	0.0002	0.00006
Tritium TBq	0.48	0.59	0.40	0.34	0.82
Carbon-14 TBq	0.69	0.64	0.54	0.65	0.64

Emissions to the air (t), TVO and Posiva	2023	2022	2021	2020	2019
GHG emissions Scope 1 (CO_2eq)	2,337	3,076	3,897	3,254	-
CO_2 emissions included in emissions trading scheme	1,522	1,439	2,436	1,751	1,388
GHG emissions Scope 2 (CO_2eq)	37,809	65,635	68,743	29,677	-
GHG emissions Scope 3 (CO_2eq)	89,290	117,170	-	-	-
NOx	2.0	1.9	3.2	2.2	2.2
SOx	0.0	0.0	0.0	0.0	0.0
Particles	0.1	0.1	0.2	0.1	0.2

Releases into water and soil

Targets:

EMISSIONS

- Radioactive water effluents are kept clearly below authority limits (continuous).
- 0 environmental accidents (in the serious/significant category) per year at Olkiluoto.

The releases of radioactive fission and activation products into water amounted to 0.07 per cent and tritium emissions to 29.1 per cent of the allowed annual limit value specified by the authorities.

Sanitary wastewater is treated at the Olkiluoto wastewater treatment plant before it is discharged into the sea. In 2023, the amount of treated sanitary wastewater was 51,328 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 requirements laid down in legislation. 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.

A disturbance lasting a few days occurred at the Olkiluoto sanitary wastewater treatment plant in the spring following the failure of a biorotor.

The Olkiluoto water management project for securing the supply of raw water and building a transfer sewer for wastewater was completed during the reporting period. Going forward, municipal wastewater from Olkiluoto will be routed via the transfer sewer to Rauma for processing. The processing of wastewater in a larger unit allows for its more efficient purification and reduces the load caused on the water systems.

Releases into the soil

Over the course of the year, a total of approximately 12 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.

The processing of wastewater in a larger unit allows for its more efficient purification and reduces the load caused on the water system.

Radioactive emissions to water	2023	2022	2021	2020	2019
Fission and activation products TBq	0.0002	0.0001	0.0002	0.0004	0.0001
% of allowed amount	0.07	0.04	0.06	0.15	0.04
Tritium TBq	22,8	2.24	1.68	1.55	1.59
% of allowed amount	29.1	2.86	9.2	8.5	8.7

Wastewater treatment	2023	2022	2021	2020	2019
Amount of water (m³)	51,328	79,387	89,957	90,304	83,545
Concentration (mg/l)[1)]					
BOD_{7ATU}	24	7.4	3.3	4	6.6
Phosphorus	0.08	0.05	0.05	0.07	0.37
Treatment efficiency average (%)[1)]					
BOD_{7ATU}	97	97	99	98	97
Phosphorus	96	100	100	99	96
Load on the sea area (kg)					
Phosphorus	28	4.4	4.4	6.2	31
Nitrogen	2,555	3,541	4,380	4,745	2,993
BOD_{7ATU}	1,351	584	296	365	548
Water treatment chemicals (t)	19	23	26	29	32

[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.

CASE

Environmental Manager Merja Levy

Dual-benefit project completed at turn of year

With the completion of the project at the end of 2023, all urban wastewater from the Olkiluoto plant area is now carried in a transfer sewer to the shared waste water treatment plant of the Town of Rauma and the forest industry. By including the implementation of a new raw water line and pump station in the earthworks project, the security of water supply at the nuclear power plant was also improved. As a result of this, Olkiluoto now receives raw water from also River Lapinjoki, in addition to River Eurajoki.

Olkiluoto's own wastewater treatment plant was approaching the end of its technical service life. The cost level of the modernisation of the treatment plant would have been the same, but the selected solution is ecologically superior.

- To have our wastewater treated at a larger plant ensures more efficient wastewater management and reduces our loading of waters. Energy efficiency is also improved, as the electricity consumption of the old wastewater purification building was higher than that of a modern plant, says TVO's Environmental Manager **Merja Levy.**

Overall, new piping was laid over a distance of about 15 kilometres during the project. The project also included three separate pumping stations for wastewater and another raw water pumping station built by River Lapijoki.

Read more on **tvo.fi**

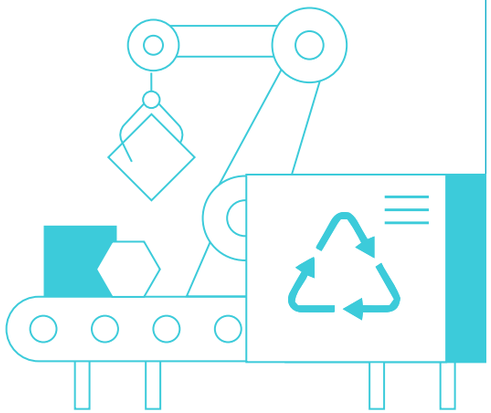
Waste

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.

Targets:

CIRCULAR ECONOMY

- Minimising the amount of waste and utilisation of waste as materials, annually at least 55% of the total waste volume by 2025 and 60% by 2030.
- 0 kg of landfill waste per year.



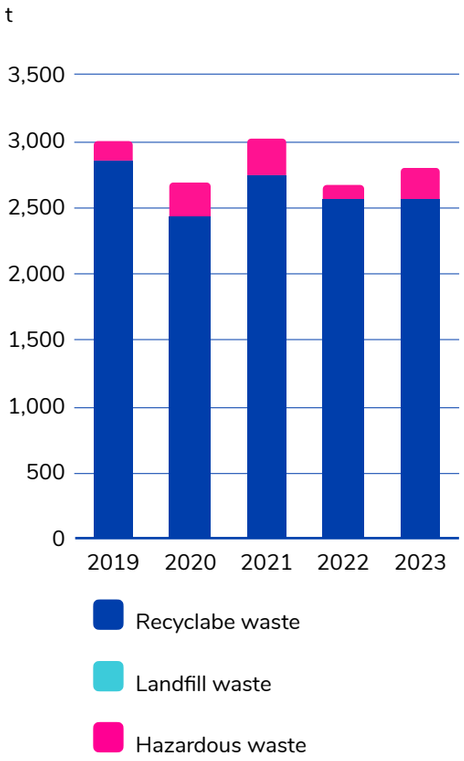
Radioactive waste

The waste produced at the power plant is classified, based on its radioactivity, into waste exempted from control, very low, 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 either very low or low-level waste; a small portion of the devices removed from the process may also be intermediate-level waste. Low and intermediate-level 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. The collection of very low-level waste was started in 2018.

Waste
Municipal waste



The ion exchange resins used for the treatment of the process water at the OL1 and OL2 plant units are classified as intermediate-level waste which is incorporated in bitumen and placed in the VLJ repository. In 2022, intermediate-level waste amounting to 114 m³ and low-level waste amounting to 22 m³ was placed in the VLJ repository.

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

The total amount of high-level radioactive waste generated during the reporting year was 32.46 t. Once the spent fuel is removed from the reactor, it is cooled in the fuel pool inside the reactor hall for a few years, after which it is transferred to the spent fuel interim storage located in the plant area (KPA storage). In the KPA storage, the fuel is stored under water, which provides shielding against radiation as well as cooling. The fuel is kept in an interim storage at Olkiluoto until it can be placed in final disposal in the Olkiluoto bedrock. The final disposal will start in the mid-2020s. Posiva is the first company in the world to commission a safe final disposal solution for spent nuclear fuel.

In order to construct the disposal repositories, approximately 500,000 solid cubic metres of Olkiluoto bedrock have been excavated by 2023. 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.

94%

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

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 of reducing 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 2023, no such waste was generated. The optimal use of chemicals is one of the ways of aiming to reduce 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 2,746 tonnes. Waste suitable for recycling as materials or reuse as energy amounted to 96 per cent of the total amount of waste, and the share of hazardous waste was 4 per cent. Most of the hazardous waste was batteries and WEEE (waste electrical and electronic equipment) as well as oil-water mixtures and glycol.

Radioactive waste	2023	2022	2021	2020	2019
Low-level (m³)[1]	17	22	0	92	150
Intermediate level (m³)[1]	64	114	0	18	7
Operating waste cleared after monitoring (t)	0	0	0	0	0

Amount of spent fuel in the OL1 and OL2 storage polls and interim storage, cumulative	2023	2022	2021	2020	2019
Number of assemblies (pcs)	10,118	9,914	9,724	9,524	9,328
Assemblies (t)	1,694.2	1,660.7	1,629.6	1,597.5	1,564.9

Municipal and hazardous waste OL1, OL2, and OL3 (t)	2023	2022	2021	2020	2019
Mixed waste to energy	108	135	209	176	126
Landfill waste to TVO's landfill	0	0	0	0	0
Paper and cardboard	78	69	73	111	69
Energy waste	130	193	203	205	194
Biowaste	95	110	98	86	66
Wood	212	153	180	220	407
Metal	158	194	172	119	955
Glass	0,4	3	4	5	4
Plastic	3	3	3	4	2
Cable refuse	13	4	9	20	11
Crushed brick and concrete	53	23	210	8	5
Screening	73	8	11	38	25
Hazardous waste	242 [2]	147 [2]	298 [2]	243	151
Sludge [3]	1,581	1,632	1,627	1,425	990

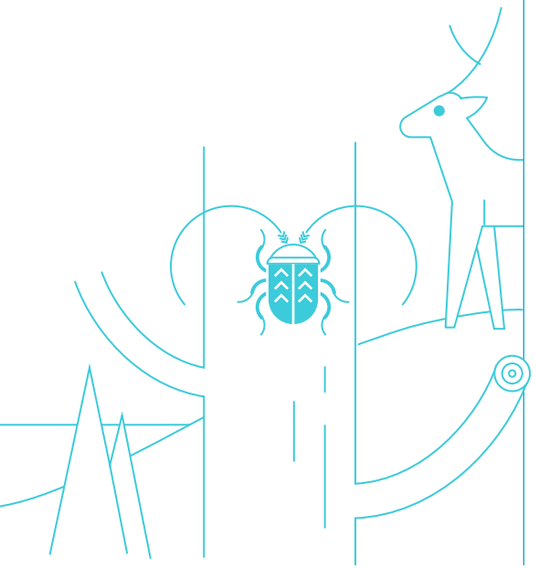
[1] Operating waste placed in the VLJ repository during the year.
[2] Includes hazardous waste recycled as material 32 t.
[3] Sludge from the wastewater treatment plant, sand water & shellfish water mixture (solid matter 8-10%).

Environmental research and biodiversity

Targets:

BIODIVERSITY

- Efficient land use: Amount of electricity generated in proportion to the surface area of the built environment approx. 15,647 GWh/km² from 2023 onwards.
- At least one voluntary project promoting biodiversity carried out annually.



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 fishers. 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. TVO has started preparations for an environmental impact assessment (EIA) concerning the service life extension and possible power uprating of the Olkiluoto 1 and Olkiluoto 2 plant units.

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 per cent of all electricity produced in Finland and about 20 per cent 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 for the preservation of other areas in their natural state.

The total surface area of 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 2024. During the reporting period, the Centre for Economic Development, Transport and the Environment carried out a survey of habitats suitable for the clouded Apollo butterfly in the Olkiluoto area and the winter bird population count carried out by the Finnish Environment Institute was started. Also, an eDNA study was performed on the seawater during the summer that surveyed the fish and clam species in the area. The benthic fauna, clams and aquatic vegetation were also studied in the immediate vicinity of the cooling water intake and discharge areas.

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. Energy production and the construction of a 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. In 2023, a new natural meadow and sunflower field were set up in the Olkiluoto area.

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 13,200.

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.

TVO and Posiva aim to improve biodiversity in connection with their operations and cooperate with stakeholders within different projects.

Cooperation with authorities

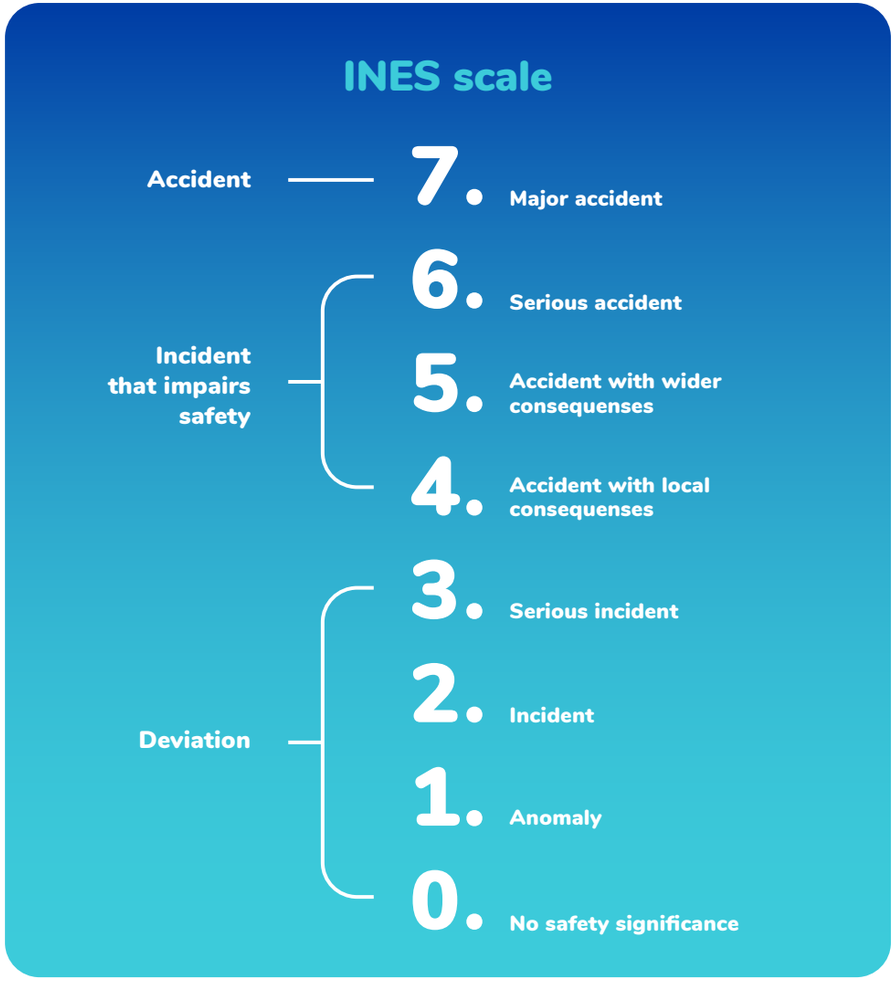
The operation of a nuclear power plant is subject to licences and permits, and it is governed by the authorities. The authority supervising nuclear and radiation safety in Finland is the Radiation and Nuclear Safety Authority, STUK.

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 (MEAE), which acts as the coordinating 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) and reports events to STUK. In 2023, 10 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. Activities at 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.

Decisions concerning environmental permits and water permits cover the power plant's 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 dumping area and the quarry material storage area. An environmental permit for the construction and operation of a near-surface disposal repository for very low-level waste was received in October

2023. The supervisory authorities for the environmental permits, i.e. the Centre for Economic Development, Transport and the Environment and the municipal environmental authority examined the activities at Olkiluoto in September and Tukes carried out a periodic assessment of the chemical licence in November.

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 Group continuously monitors statutory regulations and other requirements pertaining to its operations.

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.

The environmental authorities are informed of all significant environmental non-conformances and events. In 2023, these included the following:

- a report on the malfunction at the debris handling building of OL1 and OL2 and the completion of the modifications;
- the exceptional situations that occurred in the operation of the wastewater treatment plant in spring 2023 and
- the larger than planned hydrazine consumption of the OL3 plant unit and the single release into the sea in December 2023.

Final disposal of spent nuclear fuel

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 to initiate 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.

An operating licence application for the disposal facility was submitted to the Government in December 2021, and its processing has progressed according to plan. The installation and commissioning phase continues in the construction of the nuclear facilities. The most significant event in 2023 was the commissioning of a personnel lift between the lifting equipment building and the underground facilities. The installation of the canister lift also progressed. The underground construction and building services work proceeded well and on schedule.

The manufacture of the key encapsulation plant systems is underway. In 2023, a machining station was installed next to the canister welding station, among other things. Underground, at a depth of 430 metres, the AGV platform that operates by remote control under demanding conditions was tested and the first in-house test deposition holes were drilled. Due to delays in the delivery of certain systems, the start

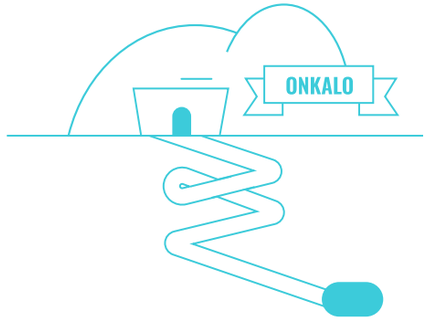
Targets:

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 of spent fuel is disposed of 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 a valued partner (continuous).



of the joint functional test (practising final disposal using non-irradiated dummy fuel elements) will be postponed until late 2024. The joint functional test was previously scheduled for late 2023.

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 life cycle 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 of partners.

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 a 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 2022 to the Ministry of Economic Affairs and Employment at the end of March 2023.

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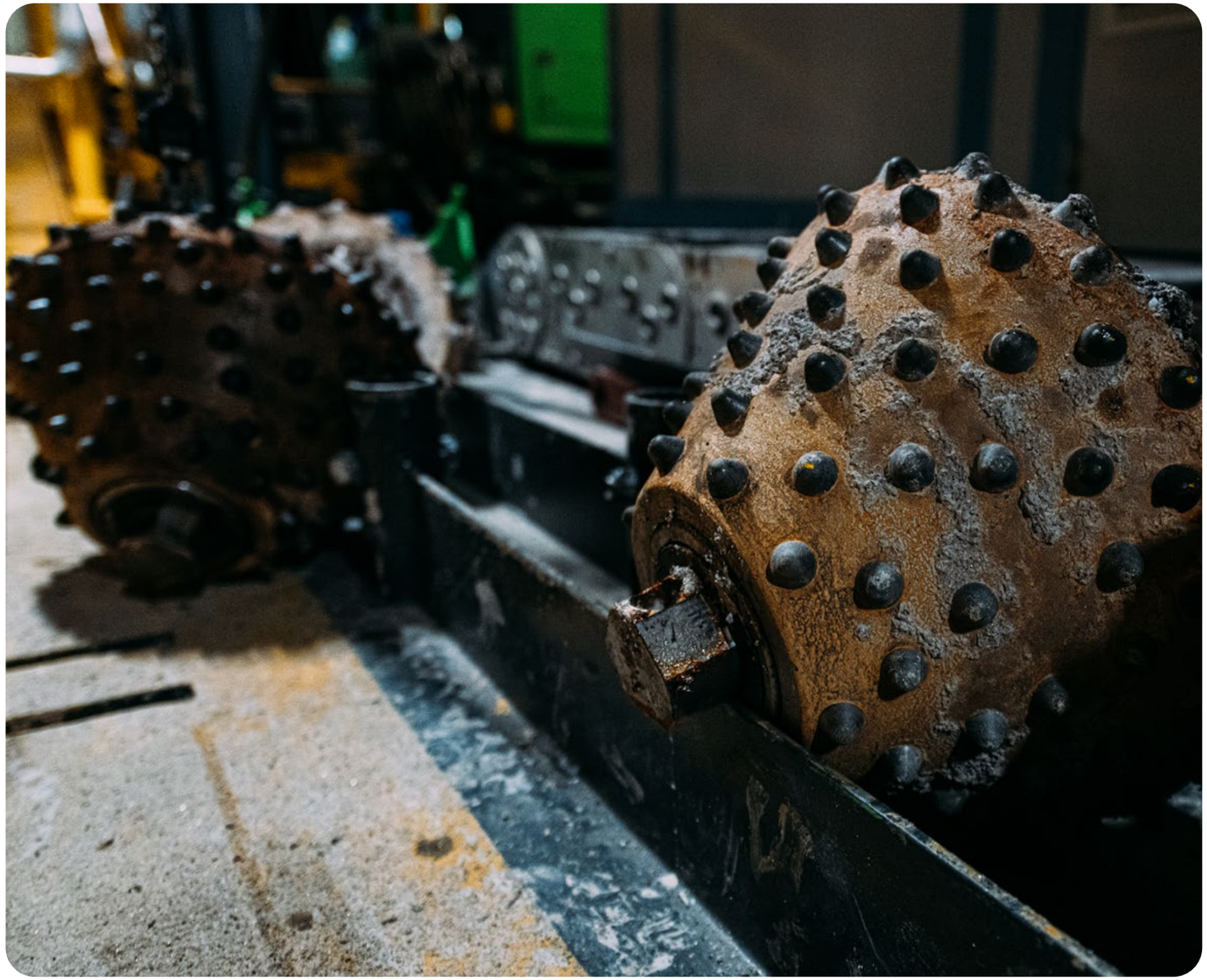


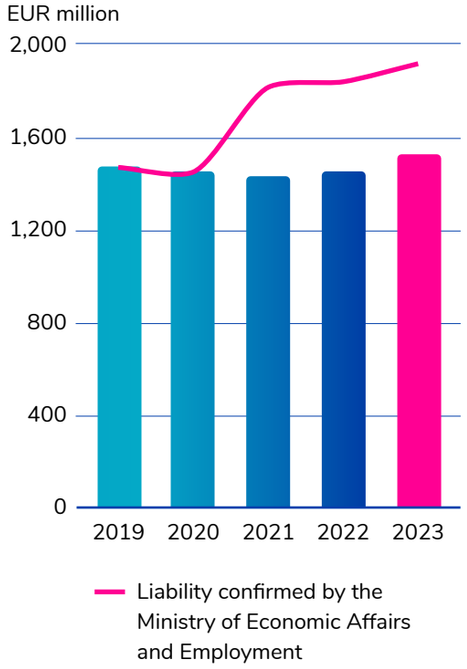
Advance collection of waste management funds

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.

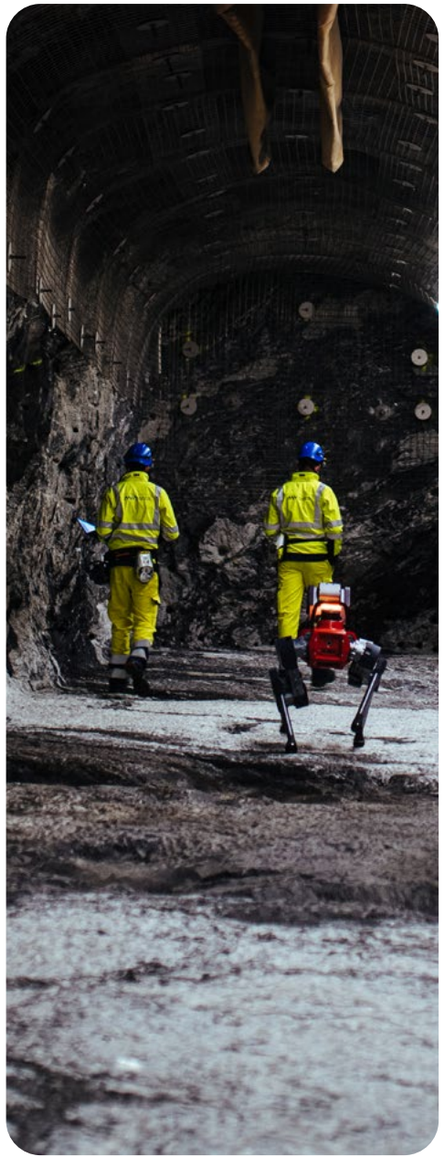
In Finland, nuclear power companies bear the costs of nuclear waste management, and the funds for that purpose are collected into the Finnish State Nuclear Waste Management Fund. Each year, the Ministry of Economic Affairs and Employment determines the share of each nuclear power company in the Fund 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 returns are 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



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



CASE

Program Manager Kimmo Kemppainen

First test deposition holes drilled by Posiva itself completed

In early 2023, four final disposal deposition holes were drilled by a crew of Posiva’s own employees using the new boring machine. The holes are located at a depth of 430 metres in the deposition tunnel built for the Trial Run of Final Disposal (TRFD).

- The first holes drilled with the DHBM boring machine operated by our own personnel were a significant step forward as Posiva moves toward the start of production, says Posiva’s Program Manager Kimmo Kemppainen.

The first four holes in the tunnel were drilled in the autumn of 2022 as test drilling operations of the boring machine by employees of the machine’s manufacturer Herrenknecht AG. The Trial Run for Final Disposal is to be carried out in the tunnels with non-irradiated dummy fuel elements in later part of 2024.

Read more on **posiva.fi**

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 employees, of which there are approximately 1,000, 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.

In this chapter:

Personnel

Targets:

EMPLOYER ROLE

» Recruiting over 100 students for internships annually.

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

The TVO Group's Code of Conduct and policies lay down the principles of personnel 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 the systematic development of professional competence and long employment relationships.

In 2023, the TVO Group continued its activities to develop the work community culture and reinforce the safety culture. The Group carries out a personnel survey every 18 months. The results of the survey, performed by Eezy Spirit Oy, were received in February 2023. The response rate was 94 per cent, and the People Power index representing the overall result was 69.4 (2021: 68.7). The result clearly improved from the previous survey, even though the rating remained in category A (satisfactory). The next survey will be conducted at the end of 2024.

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

A total of 64 new permanent employees were hired during 2023. At the end of 2023, TVO employed 1,043 people. The average number of employees during the year was 1,055. Most of TVO's employees work at Olkiluoto, with approximately 25 people working in Helsinki. The average age of TVO's employees was 43.9 years in 2023.

At the end of 2023, 22.0 per cent 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 39 permanent employees left the company, 7 of them due to retirement. Six per cent of TVO's permanent employees took parental leave during the year.

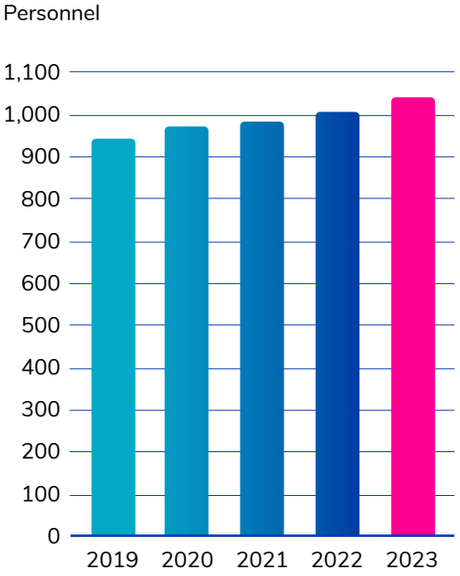
TVO employed 96 summer trainees in 2023. As in previous years, TVO participated in the Responsible Summer Job campaign, which aims to improve the quality of summer jobs and the readiness of youth between the ages of 16 and 25 to begin their working careers. TVO also continued its cooperation with educational 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 table "Social responsibility indicators" (p. 70-71).

The projects at Olkiluoto have a significant impact on employment

OL3 was ordered as a fixed-price turnkey project from a consortium (plant supplier) formed by Areva GmbH, Areva NP SAS and Siemens AG. The plant supplier's average workforce at OL3 during 1.1.-30.4.2023 was 835 persons. 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.

TVO's personnel
31 December 2023



The annual outages of the OL1 and OL2 plant units employed some 140 subcontractors from Finland and abroad every year. A total of 790 external workers participated in the annual outages in 2023, 620 of them Finnish. In addition to companies from Finland, subcontractors from 15 other countries participated in the effort.

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 2025. 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 of 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.

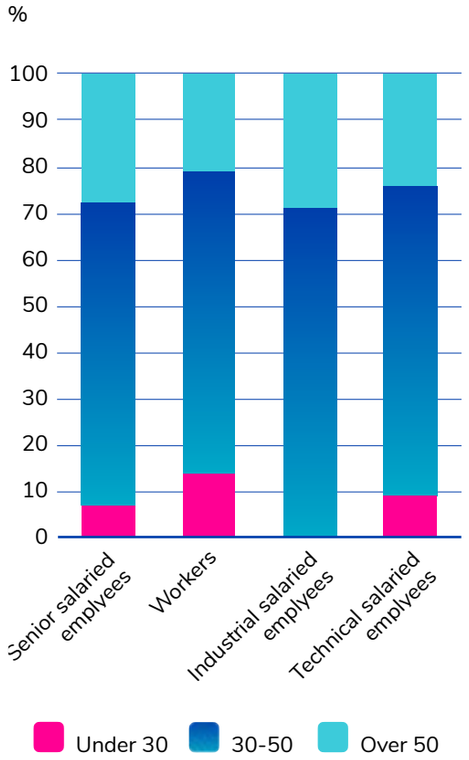
The TVO Group is committed to promoting equality and preventing discrimination in all of its activities. The TVO Group employs an equality plan that discusses equality and separately presents those courses of action that the TVO Group uses to ensure the prevention of all forms of discrimination within 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 work 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.

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

TVO's personnel by age group
31 December 2023 [1)]



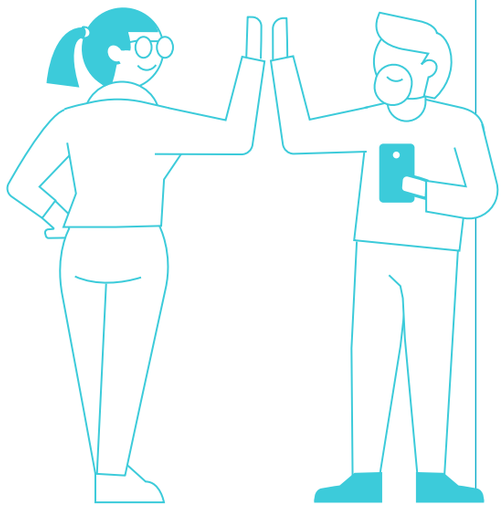
[1)] Data reported only for permanent personnel

Occupational well-being

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 (continuous).



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. In 2023, the Better Workplace group convened nine times.

The themes for developing the Better Workplace programme are formed on the basis of results from the Group's personnel survey. The targets for the Better Workplace programme in 2023 were:

- Making "decision-making transparent", that is, reviewing the Group's forums for decision-making, surveying what each person can decide on and determining the efficiency and challenges of decision-making.
- Involving strategy and values more closely in the planning of activities and everyday work in relation to each employee's own duties.
- Communicating more openly on the Group's various development projects.
- Considering common rules and meeting practices in a new, flexible way of working.

In 2023, Better Workplace continued with measures that focused on themes selected on the basis of the 2023 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 2024, focusing on targets selected on the basis of the personnel survey results and the feedback received from the field.

Occupational well-being is the sum of many components

Key actions related to the maintenance and development of occupational well-being in the TVO Group in 2023 involved stabilising new ways of working, training supervisors in the early support model and activities organised together with occupational healthcare services. The year started in January with an occupational well-being day for the entire Group that included occupational healthcare and partners from the nearby areas. In the autumn, the promotion of occupational well-being continued with an afternoon of exercise for the entire Group and a celebration organised for the personnel.

Close cooperation with occupational healthcare services has continued; for example, the occupational healthcare team has used newsletters to communicate topics related to occupational health and well-being to the personnel during the course of the year. 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. Mini webinars were arranged for the personnel concerning stress and recovery, cognitive ergonomics and giving feedback. Furthermore, the personnel has access to a low threshold online mental health service. All employees of the TVO Group are covered by occupational healthcare. Subcontractor companies are responsible for the occupational healthcare 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 comprehensive, 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, and the related 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. Communal events promoting occupational well-being have been arranged for the personnel throughout the year, in cooperation with the Group's partners. The employees also 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 improvement suggestions concerning the operations of the company, their immediate work community or their own work as well as aspects relating to salary.

Competence development

Maintaining personnel competence at the right level is an important investment in terms of a company's operations. In order for a company to succeed in their field, it needs to know which types and levels of competence it requires. Good competence management is agile and responds to changes required by the working life. Systematic, proactive and long-term competence management measures support the safe operation of the nuclear power plant.

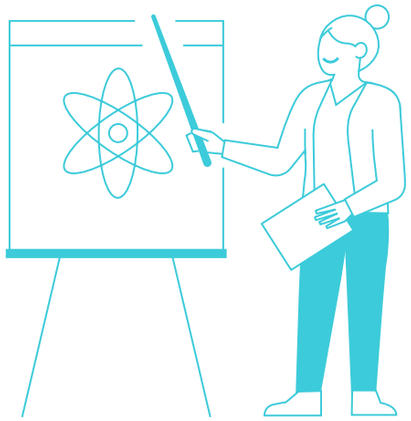
Targets:

HIGH-CLASS EXPERTISE

- Actualisation rate of competence surveys 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 based on analysed training programmes

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

The competence and qualification requirements are based on the actions pursuant to a good safety culture that are expected of the entire personnel, and the work tasks and areas of responsibility that have been defined for the roles. KSA analysis (Knowlegde, Skills, Attitudes) is used to identify the competence required for the tasks in the role.

The level of competence required for each job can be reached, for example, through well-planned induction, job guidance, mentoring, coaching, sparring, competence mapping, job rotation and targeted training requirements.

External employees are expected to complete all training related to their access areas and target group/task. External employees must commit to the TVO Group's ways of working and follow the practices described during training.

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 plans consist of the function-specific and role-based training requirements as well as those required by special roles, permits, induction and work guidance. Supervisors may also define supplementary and advanced training. The plans are discussed annually during navigation discussions. Some tasks also require separate certificates.

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 include, among other things, 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 and to develop it further.

Annual training programme compiles together trainings supporting the Company's strategy and competence

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 annual training programme contains information on the basic training, refresher training and supplementary training arranged by the TVO Group. 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 consists of twelve different main topic areas. The topics are 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 for 2023 covered a total of 475 topics, and the programme was mainly implemented according to plan. The personnel received a total of 10,511 days of training, equalling on average 9.9 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 forms of training used were classroom teaching, webinars, online training, hybrid sessions and simulator training. The forms of training that were utilised included animations, games, virtual reality and an escape room. The purpose of multimodal learning methods is to motivate and engage students and to make the training content more interesting to them.

Development in processes and data systems

The competence development projects in 2023 emphasised the creation of more detailed role-specific competence analyses (KSA), the modernisation of the online learning environment and the development of the online learning process, the reform of the competence management data system and the further development of the feedback reporting related to the trainings. The goals were met and the new feedback system was deployed in the spring, while new data systems were piloted during the autumn.

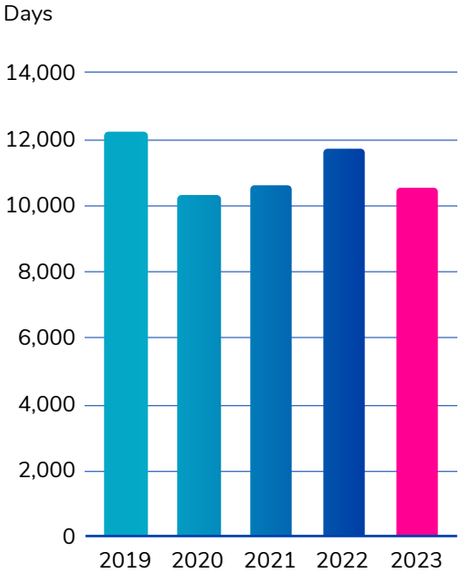
The main goal of operations training at OL1, OL2 and OL3 was the implementation of high-quality training on the simulator and in the classrooms in accordance with the annual training programme. The future plant modifications comprised one of the focus areas. The goals were reached as planned.

Common ways of working support the organisation

The operating personnel of the nuclear power plant receive comprehensive training throughout their careers. In 2023, operators of OL1, OL2 and OL3 participated in operations training days and advanced simulator courses in the spring and autumn as required by their refresher training programme.

To develop supervisor skills, the Group employs the Nuclear Professional Leader (NPL) programme. The NPL training consists of four different phases. The aim of the NPL training programme is to prepare supervisors for their tasks within the nuclear industry in more comprehensive ways than before and to provide them with the prerequisites for success. The NPL training programme is used as part of the apprenticeship training for specialist vocational qualifications in leadership.

Training days
Total



Training days
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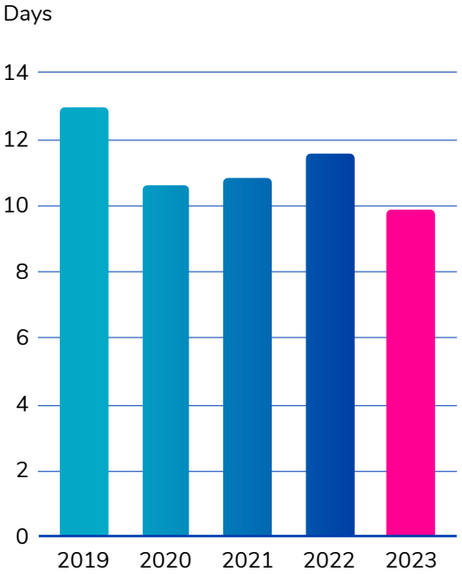


All employees working in the Olkiluoto nuclear power plant area must attend introductory training. The general section of the introductory training is intended for everyone working in the Olkiluoto area, while the radiation section is intended for those operating in the radiation-controlled area. Both training sections were provided in Finnish and English. The refreshers of all the sections are available in Finnish and English in the Group's e-learning environment.

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 946 TVO Group employees and 1,640

members of the external workforce completed the online annual outage training course. The annual outage competence was further supported by other trainings and events designed for annual outage induction.

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, with exercises to support the course contents.

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 manhole 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 atmospheres or design such facilities and equipment.

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

Versatile cooperation

The TVO Group engages in many levels of cooperation with educational institutions and students. Among other things, this aims at creating close ties between the Company and students and offering students diverse thesis opportunities and trainee positions.

The forms of cooperation with educational institutions and students include class sponsor activities and apprenticeship training. Class sponsor activities were launched with vocational degree students in the electrical and I&C field in the autumn of 2022. They cover, among other things, support for studies, organising events and visits and offering possible internships and summer jobs. Good experience has also been gained from the apprenticeship training for retraining and upgrading of qualifications in the electrical and I&C field, the aim of which is to recruit new experts into the Company.

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. The students on the course are separately picked individuals from the operators in question. The nuclear safety and waste management training gives 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 across the entire life cycle of a nuclear facility.

In 2023, TVO also participated in the Nordic Nuclear Trainee Programme (NNTP) alongside Fortum and Swedish nuclear power companies. Separately picked individuals from the operators in question were involved in the training. The purpose of the NNTP 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.

Ydinjengi2024 was launched as a new development programme. The current programme was preceded by two pilots, during which the working of the programme and the "Ydinjengi" concept were fine-tuned. Over the years, the programme has developed into an interesting and functional whole that helps people to identify and leverage their own strengths and develop Group-driven, cross-organisational activities.

CASE

Training Manager Tiina Kuusimäki

"Safety management is at the forefront of supervisory work at Olkiluoto"

The Nuclear Professional Leader (NPL) training programme designed for managerial staff, which started in Olkiluoto a couple of years ago, is in good swing. Participation percentage has been high and participants have been pleased with what the programme has given them.

Three upper-level goals have been set for the programme: The development of safety and managerial skills and the promotion of nuclear professionalism.

According to Training Manager **Tiina Kuusimäki**, certain areas focusing on knowledge, skills, and attitudes in relation to leadership have been highlighted in the programme based on these goals.

- The starting point for everything is to improve the capabilities of our managerial staff in their leadership role.

The NPL programme is a major investment for the company. It is automatically part of the training plan of all staff members working in a managerial role. At the end of 2023, there were 151 of them in the TVO Group.

- We have a clear vision of the extreme importance of managerial work and any expenditure in it is not a cost item but a clear investment.

Another indication of the value of the programme is the participation of also TVO's senior management in the actual programme, including even the CEO.

Read more on **TVO's website**

Industrial safety

Targets:

INDUSTRIAL SAFETY

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

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 industrial safety operations are guided by an ISO 45001 certified occupational health and safety system (OHS system).

The mission of the OHS function 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 2023 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 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. Everyone needs to ensure their own safety as well as that of others. When making decisions about industrial 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.

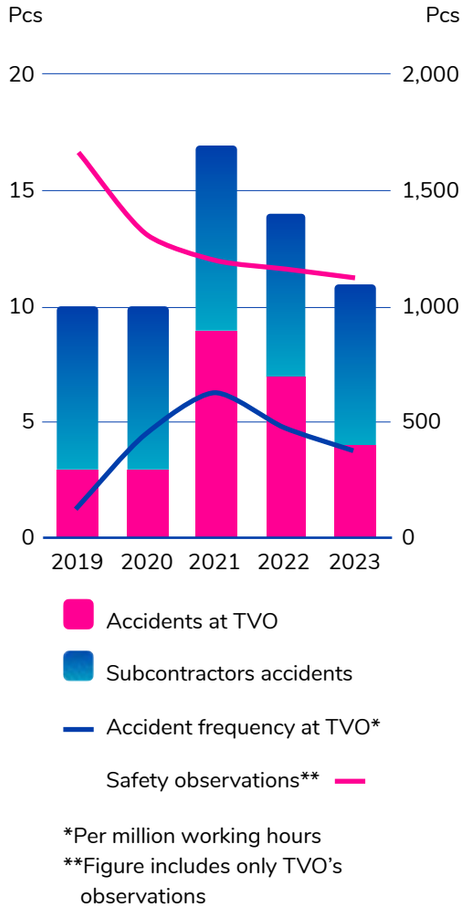
Cooperation in industrial safety across organisational borders

The industrial safety activities are coordinated by OHS experts from the Industrial and Environmental Safety competence centre. Furthermore, personnel groups (regular employees and salaried employees) have named industrial safety delegates and deputy delegates from amongst themselves. There is an Olkiluoto OHS team consisting of OHS experts, industrial 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 industrial 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 industrial safety.

The TVO Group's goal for accident frequency in 2023 is 3.5 (accidents per one

Accidents and safety observations



*Per million working hours
**Figure includes only TVO's observations

million work-hours). The accident frequency considers TVO's personnel, Posiva's personnel and all subcontractors working at Olkiluoto, including the OL3 area from 1 May 2023 onwards.

In 2023, the accident frequency for the TVO Group was 3.8 accidents per one million work-hours. During the course of the year, TVO's employees had four lost-time accidents. Correspondingly, the accident frequency for TVO personnel was 2.4. TVO personnel had a total of 89 absence days due to occupational accidents. Eleven commuting accidents involving TVO personnel took place during the year, two of them leading to absence. All the lost-time occupational accidents were investigated and corrective actions were specified to prevent reoccurrence. A total of seven lost-time accidents occurred to TVO's subcontractors at Olkiluoto, and the accident frequency was 3.3 accidents per one million work-hours. One serious occupational accident (absence of more than 30 days) occurred to TVO's personnel. No serious occupational accidents occurred among the TVO's subcontractors.

The management of the Group has specified goals for 2024 in connection with its strategy planning. Industrial 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 2.5 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 industrial 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 hazard areas that need to be checked before starting the work, thereby ensuring the safe implementation of the work. At the location, the working group must go through the hazard identification on site and verify that there are no hazards or that the hazards are under control such that they do not pose any risk of accident. If a risk that will cause danger during work performance is identified at the work area, corrective measures in order to eliminate or reduce the risk must be taken before starting the work. The assessment of psychosocial risks has been furthered as part of the industrial safety 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 industrial safety specialists are involved in the assessment process.

Safety observations are another important part of the continuous improvement of operations. Observations can also be submitted anonymously.

Reporting observed hazardous situations helps in preventing accidents. The investigation of hazardous situations and the implementation of corrective actions aim to prevent the recurrence of the events. In 2023, slipping, tripping and other accidents involving mobility 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 manager of the organisational unit of the injured employee initiates the accident investigation together with the industrial 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. A Group-wide "Pause for Safety" is held for each lost-time accident where the event is discussed. In 2023, there were seven Pauses for Safety.

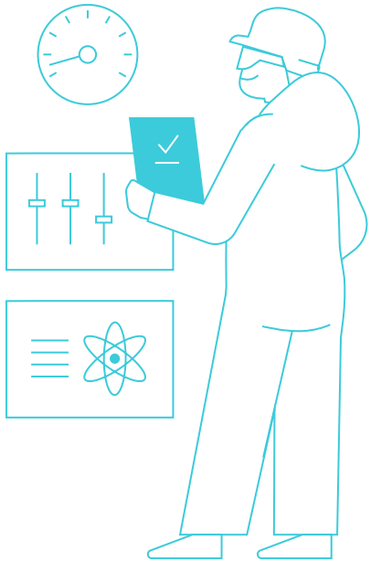
In autumn 2023, the Vital Industrial Safety Principles approved by the Group's Management Group were published; they concern the entire TVO Group and its subcontractors. A communication campaign was launched concerning the industrial safety principles. The communication campaign will continue into 2024.

Radiation safety

Targets:

RADIATION PROTECTION

- Individual radiation doses incurred by workers at Olkiluoto below half of the authority limit (10 mSv) (continuous).
- Doses incurred by members of the population below 0.8 µSv.



In all 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. The targets and actions for achieving radiation doses that are as low as possible are set forth in the ALARA programme and ALARA action plan.

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. According to the Nuclear Energy Decree, "[t]he annual dose constraint for an individual of the population arising from the normal operation of a nuclear power plant and another nuclear facility equipped with a nuclear reactor shall be 0.1 mSv." The target which TVO has set for itself is 0.0008 mSv. The dose targets that have been set have also 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 2023, the total dose of employees subject to radiation exposure at Olkiluoto was 598 manmSv. A total dose of 480 manmSv was accumulated during the power plant's annual outages. Over the course of the year, the operation of the OL3 plant unit led to a dose of 5.6 manmSv.

The combined annual dose of TVO personnel was 157 manmSv (2022: 183), and that of external personnel was 441 manmSv (2022: 607). The highest individual annual dose incurred at the Olkiluoto nuclear power plant was 5.6 mSv. The number of personnel under dose monitoring was 3,679 (2022: 3,661), with recorded doses accumulated by 716 (2022: 895) employees. The average annual radiation dose received from radiation sources in the environment by a person living in Finland is approximately 5.9 mSv[1].

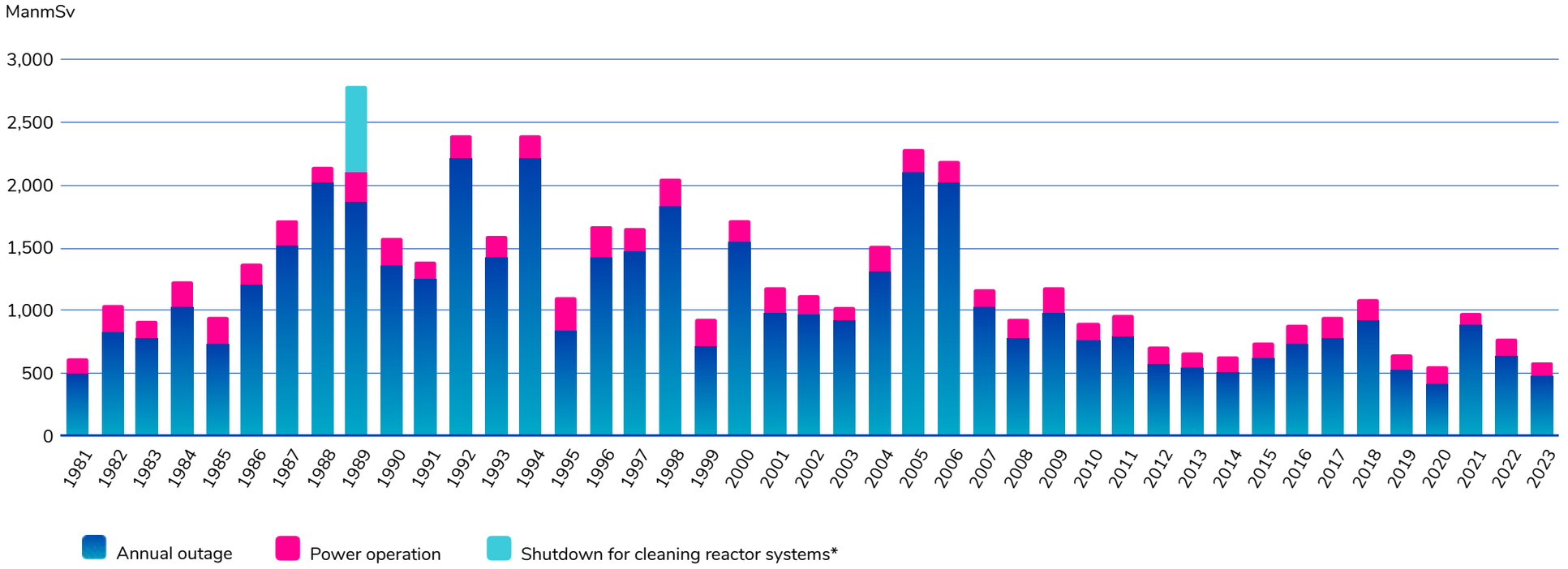
Foreign material exclusion practices

In terms of plant and personnel safety, it is important that any debris, impurities and foreign materials are prevented from entering the process. Foreign Material Exclusion (FME) practices are utilised in order to ensure the cleanliness of the process. Everyone is responsible for ensuring the cleanliness of the process in their work and for adhering to the defined ways of working.

Developing FME practices is a continuous activity which is implemented while also utilising best practices from other nuclear power plants. An action plan is drawn up each year and the implementation of its actions is regularly monitored. Areas with high FME risks were delimited and marked more clearly than before during the annual outage. During the year, role-specific training was also held; as part of this training, different functions were consulted to define what FME means for their work and which are the most efficient and suitable ways for them to prevent foreign material from entering the process. This year, FME activities were expanded to the Group level, as Posiva's functions identified areas with high FME risk and defined practices that aim to ensure the production efficiency of final disposal as well as the availability of the plant and its long-term safety.

Reference 1. Average effective dose of people living in Finland in 2018, STUK-A263 / April 2020, T. Siiskonen et al., 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.”

Sosial responsibility indicators

Personnel

Personnel structure	2023	2022	2021	2020	2019
Number of employees, permanent, 31 Dec	1,009	984	963	954	922
Male	787	770	749	743	722
Female	222	214	214	211	200
Number of employees, fixed-term, 31 Dec	34	21	19	19	19
Male	28	15	12	11	13
Female	6	6	7	8	6
Number of employees, part-time, 31 Dec [1]	17	19	13	18	20
Male	8	7	2	4	4
Female	9	12	11	14	16
Average age of employees [2]	43.9	43.3	43.2	42.7	42.6
Male	44.2	43.5	43.6	43.2	43.1
Female	42.9	42.2	41.6	41.2	40.8
Employees' place of residence (%) [2]					
Eurajoki	16	16	17	18	17
Rauma	48	49	49	48	48
Pori	18	18	18	17	17
Other	18	17	16	17	18
New employees [2]	64	87	70	77	116
Male	46	70	52	55	87
Female	18	17	18	22	29

Personnel structure	2023	2022	2021	2020	2019
Average age of new employees [2]	38.8	34.5	34.0	35.9	35.7
Male	37.9	34.6	33.8	34.6	35.8
Female	41.1	34.0	34.6	39.3	35.1
Average number of years of employment [2]	10	11	11	10	10
Incoming turnover (%) [2]	6.3	8.8	7.3	8.1	12.6
Outgoing turnover (%) [2]	3.9	6.7	6.3	4.7	6.1
Number of retirees [2]	7	16	5	11	13
Average age of retirees [2]	64.4	65.1	64.6	63.9	64.1
Summer employees	96	99	84	87	107
Male	68	67	56	65	79
Female	28	32	28	22	28
Non-guaranteed hours employees, 31 Dec	0	0	-	-	-
Board of Directors by age (%)					
Less than 30 yrs	0	0	0	0	0
30-50 yrs	10	10	10	20	20
More than 50 yrs	90	90	90	80	80
Management Group by age (%)					
Less than 30 yrs	0	0	0	0	0
30-50 yrs	38	38	31	15	8
More than 50 yrs	62	62	69	85	92

[1] The Group employees primarily work full time.
[2] Data reported only for permanent employees.

Personnel groups by gender, 31 Dec [1]	Female	Male	Total
Senior salaried employees	170 (26%)	473 (74%)	643
Regular employees	2 (1%)	182 (99%)	184
Industrial salaried employees	26 (93%)	2 (7%)	28
Technical salaried employees	24 (16%)	130 (84%)	154

[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	643	48 (7%)	418 (65%)	177 (28%)
Regular employees	184	26 (14%)	120 (65%)	38 (21%)
Industrial salaried employees	28	0	20 (71%)	8 (29%)
Technical salaried employees	154	14 (9%)	103 (67%)	37 (24%)

[1] Data reported only for permanent employees.

Permanent personnel hired in 2023 by age group	Male	Female	Total
Under 30 yrs	7	2	9
30-50 yrs	34	14	48
Over 50 yrs	5	2	7

Permanent personnel who left in 2023 by age group and gender	Male	Female	Total
Under 30 yrs	5	1	6
30-50 yrs	15	4	19
Over 50 yrs	9	5	14

Employment period of employees who left TVO in 2023 by age group and gender	Male	Female	Total
Under 30 yrs	3	0	2
30-50 yrs	4	7	4
Over 50 yrs	17	28	21
Total, on avarage	8	17	10

Well-being at work

Occupational health and safety indicators	2022	2021	2020	2019	2018
Sick leaves (%)	2.8	3.8	2.4	2.3	2.6
Male	2.6	3.7	2.3	2.1	2.5
Female	3.2	4.1	2.6	3.0	3.1
Sick leaves (hours/person)	50	68	43	43	47
Persons with zero absentee rate [1]	286	153	401	394	309
Male	233	122	320	326	254
Female	53	31	81	68	55
Occupational disease rate	0	0	0	0	0
Health percentage (%)	27.6	11.0	41	40	31.8
Proportion of preventive occupational health care and medical care of total costs (%)	45.9	45.0	43.0	46	54.0
Proportion of medical care of total costs (%)	38.5	37.0	34	44	24

[1] Data reported only for permanent employees.

Competence development

Competence indicators	2023	2022	2021	2020	2019
Training days/person	9,9	11.6	10.8	10.6	13.0
Training days total	10,511	11,680	10,608	10 342	12,249
Male	8,569	9,498	8,538	8 604	10,210
Female	1,943	2,182	2,070	1 738	2,038
Training days (average)					
Senior salaried employees (9 days/person)	5,754	6,345	5,062	5 224	6,558
Technical salaried employees (18.3 days/person)	2,822	3,422	2,970	3 269	2,744
Industrial salaried employees (4.2 days/person)	116	69	88	55	105
Regular employees (7.8 days/person)	1,450	1,480	1,484	1 373	2,495
Fixed-term and others (7.1 days/person)	369	364	1,003	421	347
Introduction training – general part (in Finnish)					
Number of attendees	2,054	1,647 [1]	2,118	2 471	2,077
Online refresher course		-	1,258	1 746	1,323
Introduction training – general part (in English)					
Number of attendees	583	565 [1]	893	1 056	1,116
Online refresher course		-	533	656	551
Introduction training – radiation part (in Finnish)					
Number of attendees	1,221	970	990	980	1,234
Online refresher course	705	788	763	810	736
Introduction training – radiation part (in English)					
Number of attendees	351	231	464	634	473
Online refresher course	221	192	177	285	88
Number of persons who completed occupational safety card training [2]		-	-	-	287

[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	2023	2022	2021	2020	2019
Working hours (incl. TVO)[1]	1,701,668	1,649,778	1,642,227	1,628,034	
Working hours (incl. TVO's subcontractors)[1]	2,112,556	1,261,237	1,367,618	1,123,432	
TVO employee accidents					
Absences, more than one day	4	7	9	3	3
Male	4	6	5	2	3
Female	0	1	4	1	0
Absences due to occupational accidents (days)	89	22	91	7	29
Male	89	19	78	2	29
Female	0	3	13	5	0
Accident frequency (accidents per one million working hours)	2.4	4.2	5.5	1.8	1.28
Male	3.0	4.7	4.0	1.6	1.9
Female	0	2.8	10.6	2.8	0
Lost day rate (per 100 employees)	10.5	2.7	11.1	0.9	4
Zero accidents, no absence	11	17	10	7	18
Male	7	11	6	2	13
Female	4	6	4	5	5
Commuting accidents	11	9	7	7	18
Male	8	4	5	5	14
Female	3	5	2	2	4
Number of safety observations [2]	1,125	1,163	1,199	1 309	1,666
Work-related fatalities (incl. TVO employees and subcontractors)	0	0	0	0	0
TVO subcontractor accidents					
Absence of more than one day (LTA1)	7	7	8	7	7

[1] Reported as of 2020.
[2] The number includes only TVO's observations.

Group-level indicators

	2023	2022
Number of employees, permanent, 31 Dec [1]	1,097	1,071
Male	853	837
Female	244	234
Number of employees, fixed-term, 31 Dec [1]	37	26
Male	31	20
Female	6	6
Number of employees, part-time, 31 Dec [1] [2]	19	20
Male	10	8
Female	9	12
Incoming turnover (%) [1] [3]	6.3	8.9
Outgoing turnover (%) [1] [3]	3.9	6.3
Summer employees [1]	102	106
Male	71	71
Female	31	35
Non-guaranteed hours employees, 31 Dec [1]	0	0
Sick leaves (%), TVO	2.8	3.8
Male	2.6	3.7
Female	3.2	4.1
Sick leaves (%), Posiva	1.5	1.9
Male	1.5	1.9
Female	1.4	2.0
Accident frequency (accidents per one million working hours) [4]	3.8	4.8

[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, including the OL3 area as of May 1 2023.

Radiation safety

Radiation safety indicators	2023	2022	2021	2020	2019
Highest radiation dose of personnel (mSv) [1]	5.6	6.5	8.1	7.8	7.5
Collective radiation dose (manmSv)	598	789	984	565	647
Annual outage dose (manmSv)	480	647	884	413	530

[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 2023.

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 as a taxpayer.

In this chapter:

Competitive operations

Targets:

CUSTOMER-ORIENTED AND COMPETITIVE ACTIVITIES

- The load factor of the Olkiluoto plant units is 90–95% as a rolling three-year average (continuous).
- The rolling three-year total production cost average is below €20/MWh in 2023. Counting 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 FORM OF PRODUCTION

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

FUNDS READY FOR FINAL DISPOSAL

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

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 2023, TVO produced approximately one third 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.

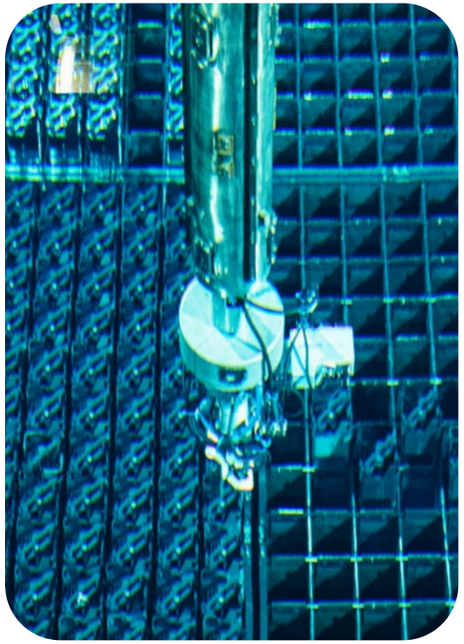
In 2023, TVO's most important financial goals included achieving the desired production cost level and reaching the planned electricity delivery volume. The key financial responsibility indicators are discussed in the 2023 Financial Statements.

Electricity production at Olkiluoto is growing

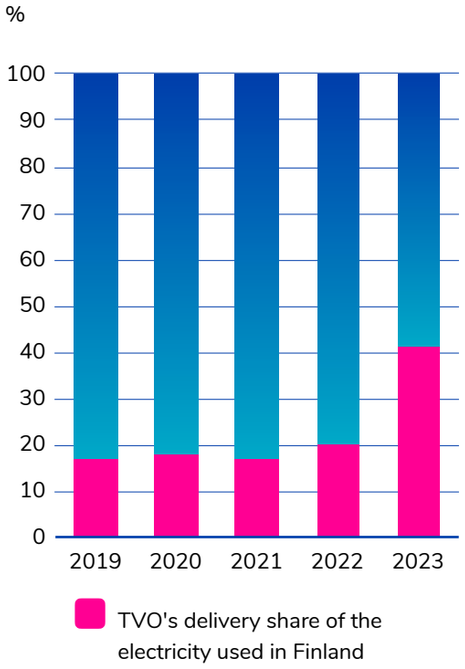
In 2023, the combined electricity output of the plant units OL1, OL2 and OL3 was 24,671 (16,351) GWh.

The combined load factor for OL1 and OL2 was 91.9 (93.0) per cent. Regular electricity production for OL3 started on 16 April 2023, and TVO confirmed the provisional takeover of the plant unit for the warranty period on 20 April 2023.

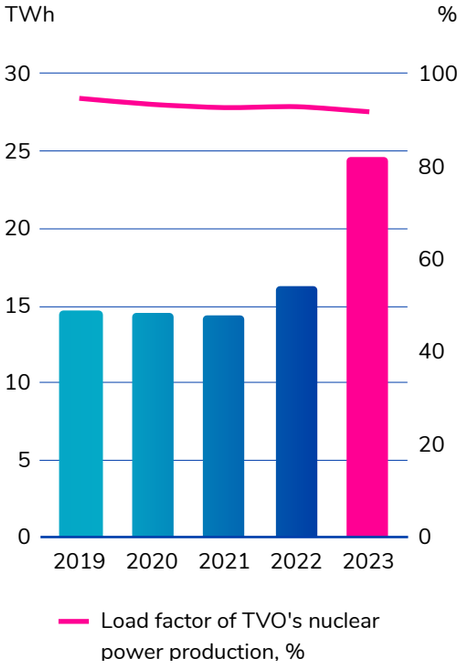
The net production for OL1 was 7,428 (6,932) GWh and the load factor was 95.4 (89.1) per cent. The net production for OL2 was 6,871 (7,532) GWh and the load factor was 88.3 (96.8) per cent. The net production for OL3 was 10,372 (1,887) GWh and the load factor was 73.3 (16.9) per cent. TVO's investments in 2023 amounted to EUR 449.0 million, of which the OL3 project accounted for EUR 369.7 million.



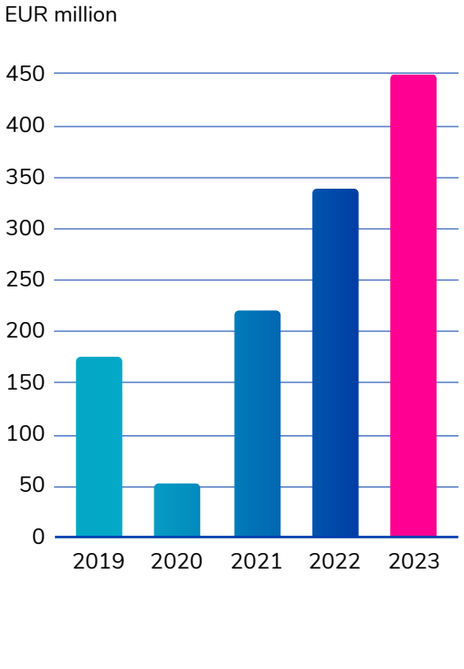
TVO's delivery share
of the electricity used in Finland



TVO's electricity production



Investments



CASE

TVO joins green bond market as the first European nuclear power company

On December 2023, TVO issued a private placement of green notes to the amount of EUR 280 million.

This was the first issue under the Green Bond Framework set up by TVO in the summer of 2023.

- The inclusion of nuclear in EU taxonomy in the summer of 2022 was the first driver for the greenness of nuclear power. We were the first European nuclear power company that had the opportunity to issue green notes, says **Lauri Piekkari** who is the Senior Vice President, Treasury, for TVO.

The funds raised from the issue will be invested in initiatives and projects that conform to TVO's Green Bond Framework. This Framework is based on environmentally friendly electricity production at TVO's three nuclear power plant units in Olkiluoto as well as on sustainable nuclear waste management. In addition, the generation of a large amount of electricity on a small land area is beneficial for biodiversity.

- In practice, we can use the funds quite freely, as the Green Bond Framework can be applied to the financing of any investments at the Olkiluoto 1, Olkiluoto 2, and Olkiluoto 3 plant units, or to the refinancing of investments that have already been made, Lauri Piekkari explains.

TVO's electricity production is 100% in compliance with the EU taxonomy.

Read more on **TVO's website**

Economic impacts

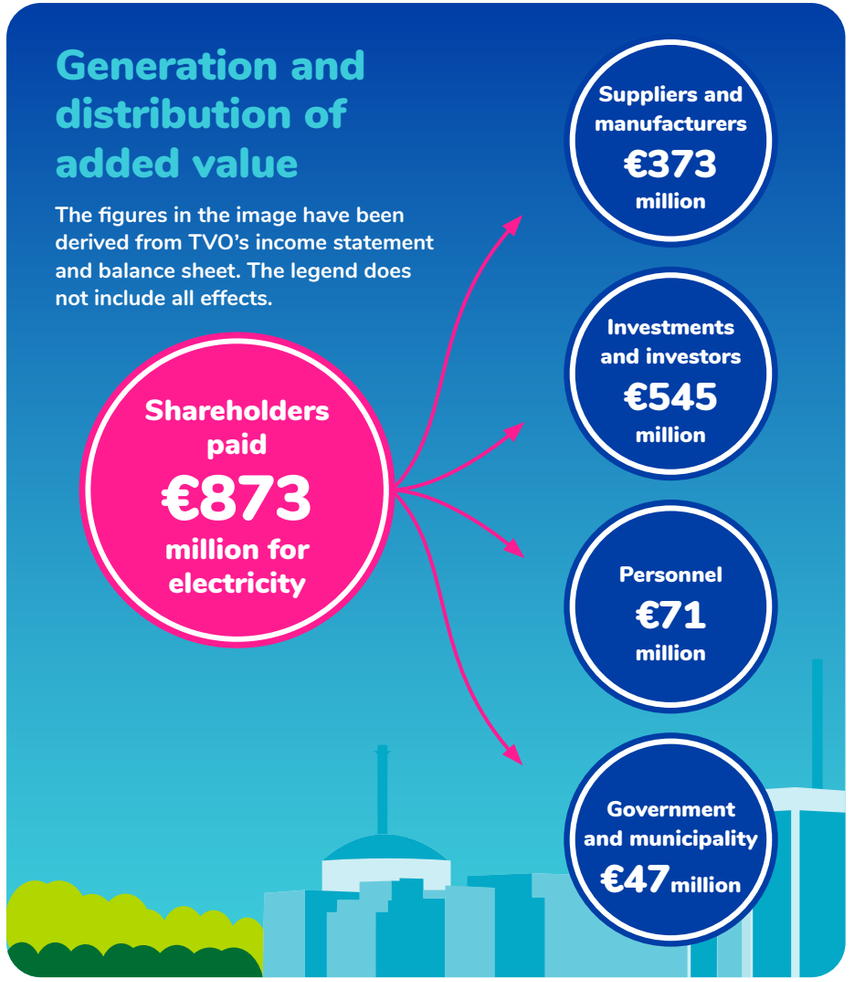
In the reporting of its economic responsibility, TVO uses the applicable indicators of the GRI Standards. TVO also reports some figures that are gathered as a part of the closing of accounts but that are not included in the actual financial statements. The economic impact (M€) of TVO to the key stakeholders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

Generation of added value

Shareholders: TVO produces electricity to its shareholders at cost price. In 2023, TVO's shareholders paid a total of EUR 873 (353) million for the electricity. TVO delivered 24,634 GWh of electricity, approximately one third of the 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 (232): A total of 790 external workers participated in the annual outages, 620 of them Finnish. In addition to companies from Finland, subcontractors from 15 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; Logent Service Oy, responsible for warehouse and logistics services; and RTK-Palvelu Oy, responsible for cleaning and sanitation services. These companies employ more than 340 people at Olkiluoto. In total, TVO regularly provided work for almost 740 subcontractors and consultants at Olkiluoto.

INVESTMENTS AND INVESTORS:

Investors: At the end of the year, TVO's current and non-current liabilities amounted to EUR 5,539 (5,727) million. The company raised a total of EUR 1,174 (1,050) million in new non-current liabilities, while repayments amounted to EUR 1,352 (458) million.

Investments: The Olkiluoto nuclear power plant is continuously kept in good condition in terms of production and functionality through alternating refuelling and service outages at the plant units. Major modifications during the service outage 2023 included turbine I&C renovation, replacement of the containment's electrical penetrations, modification of the reactor water level measurement and the replacement of the off-gas venting system emergency fans.

In 2023, investments in the OL3 project amounted to EUR 382 (276) million.

The total R&D expenses amounted to EUR 15.9 (17.1) million, of which most were used for R&D related to nuclear waste management.

Personnel: At the end of the year, TVO employed 1,043 (1,005) persons.
In 2023, TVO hired 64 (87) new employees, and 7 (16) employees retired.

In addition, subcontracting work for projects provides employment both in Finland and abroad.

State and municipality: TVO paid the municipality of Eurajoki EUR 18 (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. The environmental reporting data has also been verified by an independent, objective party.

The Annual and Sustainability Report 2023 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 2023, prepared in accordance with the IFRS standard, 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 2023, which describes TVO's management systems and the duties of TVO's administrative bodies.

TVO also publishes a separate Environmental Report 2023, which information is based on a certified environmental management system.

In this chapter:

Sustainability reporting

TVO has reported on its responsible management of the environment since 1996 and on sustainability since 2001.

The Annual and Sustainability Report 2023 (1 January to 31 December 2023) has been published in Finnish and English on TVO's website on 26 February 2024. 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 2022 was published on TVO's website in February 2023. The 2024 data will be published in spring 2025. 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. 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, annual report and administration for 2023 have been audited by PricewaterhouseCoopers Oy, Authorised Public Accountants.

Measurement and calculation principles

This report has been prepared in compliance 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, a joint venture of TVO, 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 subcontractors.

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 2023 to 31 December 2023.

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. 85** Corporate Governance Statement p. 3
2-2: Entities included in the organization's sustainability reporting	**TVO in brief p. 3** **Sustainability reporting p. 79**
2-3: Reporting period, frequency and contact point	**GRI and appendices p. 78** **Sustainability reporting p. 79** **Sustainability contact persons p. 85**
2-4: Restatements of information	**Sustainability reporting p. 79**
2-5: External assurance	**GRI and appendices p. 78** **Sustainability reporting p. 79** **Independent Assurance Report to the Management of Teollisuuden Voima Oyj p. 83-84**
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. 23-24**
2-7: Employees	**Personnel p. 59-60** **Social responsibility indicators p. 70-71**
2-8: Workers who are not employees	**Personnel p. 59–60** 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 & Security p. 30** **Industrial safety p. 66-67** 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. 11 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	**Responsible leadership p. 12**
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. 48 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. 48 **Personnel p. 56–60**
2-21: Annual total compensation ratio	**GRI index** Information unavailable. Data not available for the reporting period. TVO's target is to report the figure in the 2024 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. 10-12 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. 18–19 Stakeholder cooperation p. 20 Radiation safety p. 68-69 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. 20 Report of the Board of Directors and Financial Statements p. 7 and 12
2-27: Compliance with laws and regulations	Cooperation with authorities p. 54
2-28: Membership associations	Stakeholder cooperation p. 20–22
Stakeholder engagement	
2-29: Approach to stakeholder engagement	Responsible leadership p. 10–12 Stakeholder cooperation p. 20–22 Responsible procurement operations p. 23–24 Safety & Security p. 30 Safety culture p. 32 Economic impacts p. 77
2-30: Collective bargaining agreements	Personnel p. 60
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. 13-16 Environmental management p. 17 Effects of climate change on the business p. 18-19 Stakeholder cooperation p. 20 Radiation safety p. 68
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. 74 Competitive operations p. 75-76 Economic impacts p. 77
GRI 203: INDIRECT ECONOMIC IMPACTS (2016)	
203-2: Significant indirect economic impacts	Value creation p. 8 Responsible procurement operations p. 23 Research and development p. 25
ENVIRONMENTAL STANDARDS	
GRI 301: MATERIALS (2016)	
301-1: Materials used by weight or volume	Environmental balance sheet p. 40 Cooling water p. 41 Raw materials and material efficiency p. 42
GRI 302: ENERGY (2016)	
302-1: Energy consumption within the organization	Environmental management p. 17 Environmental balance sheet p. 40 Cooling water p. 41 Raw materials and material efficiency p. 42 Production and energy efficiency p. 43-45 Economic impacts p. 77
302-4: Reduction of energy consumption	Environmental management p. 17 Production and energy efficiency p. 43-45
GRI 303: WATER AND EFFLUENTS (2018)	
303-1: Interactions with water as a shared resource	Environmental management p. 17 Environment and energy efficiency programme p. 38 Follow-up for environmental impacts p. 39 Environmental balance sheet p. 40 Cooling water p. 41 Raw materials and material efficiency p. 42 Releases into water and soil p. 47 Environmental research and biodiversity p. 51–52
303-2: Management of water discharge-related impacts	Environmental management p. 17 Cooling water p. 41 Releases into water and soil p. 47-48 Environmental research and biodiversity p. 51–52
303-3: Water withdrawal	Cooling water p. 41 Raw materials and material efficiency p. 42
303-4: Water discharge	Cooling water p. 41 Releases into water and soil p. 47
303-5: Water consumption	Environmental balance sheet p. 40

TVO's responsibility aspect	Location and comments
GRI 305: EMISSIONS (2016)	
305-1: Direct (Scope 1) GHG emissions	**Sustainability Roadmap 2030 p. 13-16** **Effects of climate change on the business p. 18–19** **The environmental impacts of nuclear power p. 34** **Finland's greatest climate act p. 36** **Environmental balance sheet p. 40** **Releases into the air p. 46** 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. 18–19** **Releases into the air p. 46** **Cooperation with authorities p. 53-54** **Sustainability reporting p. 79** 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. 37** **Waste p. 49–50** **Environmental research and biodiversity p. 51–52** **Cooperation with authorities p. 53** **Final disposal of spent nuclear fuel p. 55–57**
306-2: Management of significant waste-related impacts	**Responsibility for the environment and climate p. 37** **Waste p. 49-50** **Environmental research and biodiversity p. 51-52** **Cooperation with authorities p. 53** **Final disposal of spent nuclear fuel p. 55–57**
306-3: Waste generated	**Waste p. 49–50** 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. 70, 73** 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. 10–12** **Responsible procurement operations p. 23** **Occupational well-being p. 61–62** **Competence development p. 63–65** **Industrial safety p. 66–67** **Radiation safety p. 68-69**
403-2: Hazard identification, risk assessment, and incident investigation	**Industrial safety p. 66–67**
403-3: Occupational health services	**Occupational well-being p. 61–62**
403-4: Worker participation, consultation, and communication on occupational health and safety	**Occupational well-being p. 61** **Industrial safety p. 66–67**
403-5: Worker training on occupational health and safety	**Occupational well-being p. 61–62** **Competence development p. 63–65**
403-6: Promotion of worker health	**Occupational well-being p. 61–62**
403-7: Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	**Occupational well-being p. 61–62** **Competence development p. 63–65** **Industrial safety p. 66–67**
403-8: Workers covered by an occupational health and safety management system	**Industrial safety p. 66–67**
403-9: Work-related injuries	**Industrial safety p. 66–67**
GRI 404: TRAINING AND EDUCATION (2016)	
404-1: Average hours of training per year per employee	**Competence development p. 63–65**
TVO'S OWN INDICATORS	
TVO: Number of employees during annual outage	**Safety & Security p. 30** **Personnel p. 59**
TVO: Average number of subcontractors' employees on OL3 site	**Personnel p. 59**
TVO: Occupational health and safety	**Occupational well-being p. 61–62** **Industrial safety p. 66–67**
TVO: Preparing for crises and emergencies	**Safety & Security p. 29-31**
TVO: Level of safety	**Safety & Security p. 29-31**
TVO: Investments to secure the availability and profitability of plant units	**Economic impacts p. 77**
TVO: Decommissioning of the nuclear power plant	**Waste p. 49–50** **Environmental research and biodiversity p. 51–52** **Final disposal of spent nuclear fuel p. 55–57**

Independent Practitioner's Assurance Report to the Management of Teollisuuden Voima Oyj

This document is an English translation of the Finnish language original report

We have been engaged by the Management of Teollisuuden Voima Oyj (0196656-0) (hereafter "TVO" or the "Company") to provide limited assurance on selected corporate sustainability indicators presented in the TVO's Sustainability Report 2023 (hereafter "Selected Corporate Sustainability Information") for the year ended on 31 December 2023.

The Selected Corporate Sustainability 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 401-1: New employee hires and employee turnover
- Occupational Health and Safety: GRI 403-9: Work-related injuries
- Training and Education: 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

Management's responsibilities

The Management of TVO is responsible for the preparation and presentation of the Selected Corporate Sustainability Information in accordance with the reporting criteria, i.e. the Company's reporting guidelines and GRI Sustainability Reporting Standards. 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 Sustainability 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 Sustainability Information is free from material misstatement. The nature, timing and extent of the assurance procedures selected depend on professional judgement, including the assessment of material misstatement due to irregularity or error. We believe that the evidence we obtain is sufficient and appropriate to provide a basis for our conclusion on limited assurance.
We are independent of the Company in accordance with the ethical requirements applicable in Finland to the engagement we have undertaken and have fulfilled our other ethical obligations under those requirements.

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.

Procedures performed

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

- Interviewed s member of TVO's senior management and relevant staff responsible for providing the Selected Corporate Sustainability Information;
- Assessed the application of the GRI Sustainability Reporting Standards reporting principles in the presentation of the Selected Corporate Sustainability Information;
- Assessed data management processes, information systems and working methods used to gather and consolidate the Selected Corporate Sustainability Information;

- Reviewed the presented the Selected Corporate Sustainability Information and assessed its quality and reporting boundary definitions and;
- Assessed the Selected Corporate Sustainability Information's data accuracy and completeness through a review of the original documents and systems on a sample basis.

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 Sustainability Information subject to the limited assurance engagement is not prepared, in all material respects, in accordance with Company's reporting guidelines and the GRI Sustainability Reporting Standards.

Helsinki, 23 February 2024

KPMG Oy Ab

Esa Kailiala
Authorised Public Accountant

Tomas Otterström
Partner, Advisory

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