REPORT OF THE BOARD OF DIRECTORS
AND FINANCIAL STATEMENTS

2019

tvo

Contents

Report of the Board of Directors of Teollisuuden Voima Oyj 2019

Main events in 2019

THE ROLE of low-carbon energy, such as renewable energy and nuclear power, is crucial in the mitigation of climate change. The Intergovernmental Panel for Climate Change (IPCC) 2019 report included four scenarios, how to limit global warming to +1,5 °C. The increase in nuclear power production between the years 2010–2050 varies from 98 percent to 501 percent in different scenarios. Nuclear power remains a major part of the energy selection of Finland and the entire EU as we make our way towards a carbon-neutral society. In 2019, the share of nuclear power was about 35 percent of all electricity produced in Finland. During its 50-year history, Teollisuuden Voima Oyj (TVO) has produced more than 510 terawatt hours (billion kilowatt hours) of climate friendly electricity in total.

The electricity generation at TVO's Olkiluoto nuclear power plant in 2019 totaled 14.75 terawatt hours (billion kilowatt hours), which accounted for about one-sixth of all electricity consumed and about 22 percent of all electricity produced in Finland. The combined load factor of the plant units was 94.8 percent. Together with the share of the Meri-Pori coal-fired power plant TVO's production totaled 14.93 (14.7) TWh, which accounted for about 17 percent of all electricity consumed and about 22.6 percent of all electricity produced in Finland. The Group's turnover was EUR 254.2 (350.3) million.

Olkiluoto 1 and 2 plant units are in safe and good production condition. In 2019, OL1 plant unit made its production record 7,542 GWh and the co-production of the plant units reached 14,751 GWh, which is the second highest in their history.

The refueling and maintenance outages carried out at the plant units on alternating years are designed to ensure that a good level of production and operability is maintained at the Olkiluoto nuclear power plant at all times. In 2019, the annual outages were carried out successfully and the Company's safety culture – the basis of all operations – was further developed. The annual outages were started with a maintenance outage at OL2 plant unit on 1 May. The outage was brought forward by four days to remove damaged fuel from the reactor. Damaged fuel assemblies were removed from the reactor and replaced with fresh fuel. In addition to refueling, significant works at OL2 included the pressure test of the primary circuit and renewal of the heat exchanger in the purification system of reactor water. Also, Fingrid's 400 kV switchgear was taken into use during the outage. The outage took 25 days and the plant unit was connected to the grid as planned on 26 May.

The annual outage carried out at the OL1 plant unit was a refueling outage. The outage was started on 2 June, and it was completed on 11 June as planned.

In April 2016, TVO submitted to the Ministry of Economic Affairs and Employment an application for an operating license for the Olkiluoto 3 EPR plant unit and the Finnish Government granted the license until 2038 on 7 March 2019.

Preparing the Olkiluoto 3 EPR (OL3 EPR) plant unit for production proceeded in 2019. Training of the operating personnel has progressed as planned. Most of the construction work for the plant unit has been completed. The installation of the electrical systems, the instrumentation and control system (I&C), and mechanical systems is still in progress. The operating personnel was granted operator licenses by the Radiation and Nuclear Safety Authority (STUK) at the end of 2018. During the hot functional testing (HFT) in spring 2018, it was noticed that the pressurizer surge line vibrates. In May 2019, STUK approved the solution to eliminate the vibration and the absorbers have been installed in their places. STUK will approve the structures of the absorbers before nuclear fuel is loaded into the reactor.

According to the updated schedule provided by the plant supplier Areva–Siemens Consortium in December, nuclear fuel will be loaded into the reactor in June 2020, the first connection to the grid will take place in November 2020, and regular electricity production of the OL3 EPR nuclear power plant unit will start in March 2021. Preparational works for the loading of nuclear fuel are in progress.

Posiva has started to construct the encapsulation plant and the final disposal facility which are designed for spent fuel handling. The EKA project covers the full completion of the encapsulation facility, supplementary excavation works of the final disposal facility, installation of the systems needed to start the final disposal, the operating license process and preparation of supply chains needed in the production phase.

The foundation stone for Posiva's encapsulation plant was laid with attendance of the Prime Minister of Finland on 23 September.

At the end of the year, the total number of personnel in the Group was 942 (878). The number of personnel working for Posiva and its subsidiary Posiva Solutions Oy was 90 (85). The past year was a notable recruitment year: a total of 129 new staff members were recruited during 2019.

Operating environment

THE TOTAL electricity consumption in Finland in 2019 was 86 terawatt hours (TWh). Consumption decreased by 1.7 percent compared to the previous year. The share of net electricity imports was 23 percent of the total consumption. The amount of nuclear power generated in 2019 was 23 TWh, which accounted for 27 percent of the electricity procured.

Most of the amendments of the Business Income Tax Act, which were realized to implement the requirements of the EU Directive preventing aggressive international tax planning, entered into force on 1 January 2019. The Act applies to all companies regulated by the Business Income Tax Act, including energy companies operating according to the Mankala principle. The Ministry of Finance still continues the preparation of an “infrastructure exception” for the Act in accordance with a statement from Parliament.

Negotiations on the package on sustainable investment continue in the European union. The tripartite meetings, “trilogues”, between the European Parliament, the Council of the European Union and the European Commission were completed in December. The Commission will continue and takes responsibility of the preparation of Sustainable Finance legislation in the beginning of 2020.

The European Parliament has approved the new composition of the European Commission in November. In 2020, the Commission will present a plan to reduce EU’s greenhouse gas emissions by 55% by 2030.

TVO as a company

TVO is a non-listed public limited-liability company owned by Finnish industrial and energy companies. According to TVO’s Articles of Association, the Company operates in the fields of power plant and transmission system construction and acquisition as well as in the generation, relay and transfer of electricity primarily to the Company’s shareholders in accordance with the terms set in the Articles of Association.

TVO operates on a cost-price principle (Mankala principle). TVO’s goal is not to make profit or pay dividends. The shareholders are charged incurred costs on the price of electricity, and thus in principle the profit/loss for the period under review is zero, unless specific circumstances dictate otherwise. The shareholders pay variable costs based on the volumes of energy supplied and fixed costs in proportion to their ownership, regardless of whether they have made any use of their share of the output or not. Because of the Company’s operating principle, key indicators based on financial performance will not be presented (see chapter: The cost-price principle in the Notes to the consolidated financial statements).

TVO is owned by six shareholders, some of which, like TVO, operate on the Mankala principle. Electricity generated by TVO serves the needs of numerous Finnish industry and energy companies, some of which were owned by 132 Finnish municipalities in 2019. TVO generates about 17 percent of all electricity consumed in Finland.

TVO’s operations are founded on strong safety culture and securing the safety of production. TVO’s activity-based management system covers production activities at the Olkiluoto nuclear power plant, maintaining and developing production capacity, additional construction of production capacity and functions required to control and resource these activities. The system meets the requirements of international quality control, environmental, occupational health and occupational safety standards, and has been certified by DNV GL Business Assurance Finland Oy Ab. The general part of the activity-based management system also acts as the licensee’s quality control system approved by the Radiation and Nuclear Safety Authority in Finland (STUK). The implementation, functionality and efficiency of the activity-based management system is regularly monitored with internal audits and management reviews.

TVO’s Corporate Governance system is described in a separate report. TVO’s principles of responsible operating practices are described in TVO’s Code of Conduct (see chapter: Responsibility).

The objectives of TVO’s strategy include the competitive and predictable price of electricity, a solid safety brand and satisfied customers. The goal is to maintain a competitive average electricity production cost and to ensure that the operability of the plant units meets the Company’s goals. Safety culture is maintained at a high level and safety is systematically upheld and developed at all stages of the nuclear power lifecycle.

Financial performance

THE GROUP'S consolidated turnover for 2019 was EUR 254.2 (350.3) million. The lower fixed fee invoiced from shareholders compared to the previous year was due to the Nuclear Waste Management fee of the Finnish State Nuclear Waste Management Fund (see chapter: Nuclear waste management), which caused a lower turnover compared to 2018. In addition, the amount of delivered electricity of Meri-Pori power plant was lower than the previous year.

The amount of electricity delivered to the shareholders was 14,911 (14,723) GWh. The higher delivery volume of electricity to shareholders was due to shorter annual outages in Olkiluoto power plants.

The consolidated profit was EUR 87.2 (loss -18.2) million. An updated cost estimate based on a new nuclear waste management technical plan and schedule and the changes of the provision regarding nuclear waste management obligation had an effect on the profit/loss and turnover of the year 2019. The change of discount rate used in calculating fair value of assets and debts related to nuclear waste management liability also affects to the consolidated profit/loss of 2019.

Financing and liquidity

TVO'S financial situation has developed as planned.

TVO's liabilities (non-current and current) at the end of the year, excluding the loan from the Finnish State Nuclear Waste Management Fund relent to shareholders, totaled EUR 4,961.6 (4,749.8) million, of which EUR 679.3 (679.3) million were subordinated shareholder loans. During 2019, TVO raised a total of EUR 943.2 (894.3) million in non-current liabilities. Subordinated shareholder loans were not raised (EUR 100.0 million in 2018). Repayments during the year amounted to EUR 742.4 (717.9) million. EUR 250.0 million of shareholder loans are still undrawn.

The Company has a EUR 1,300 million syndicated revolving credit facility in total which consists of two tranches. EUR 1,000 million matures in 2023 and EUR 300 million matures in 2021. During 2019, the maturity of the EUR 300 million tranche was extended to 2022.

In September, TVO issued a new EUR 550 million bond which was later increased (tap) by EUR 100 million, bringing the total outstanding amount to EUR 650 million. The maturity of the bond is six years. Approximately EUR 350 million of the new issue was used in partial premature repurchase of the EUR 500 million bond maturing in March 2021. In addition, the company issued a total amount of SEK 1,000 million in private placement loans with a maturity time of five years.

In September, the Fitch Rating Agency affirmed TVO's rating on its current level BBB- and assessed the company's outlook as stable. In December, Standard & Poor's Rating Services (S&P) placed its 'BB+' long-term and 'B' short term corporate credit rating on TVO on CreditWatch with negative implications. According to S&P, the CreditWatch placement reflects the risk that, due to the additional delay, the Trust mechanism (part of the Global Settlement Agreement signed in 2018 between the Supplier and TVO) will need additional funding to make sure that there are enough funds to complete the OL3 project and take care of all obligations until the end of guarantee period. According to S&P, CreditWatch placement can be removed when the funding in the Trust has been secured and there are no further delays in the OL3 Project.

TVO uses its right to borrow funds back from the Finnish State Nuclear Waste Management Fund within the framework of legal regulations. On December 31 2019, the amount of the loan was EUR 591.4 (666.2) million, and it has been relent to the Company's A-series shareholders. On March 29, 2019, the loan from the Finnish State Nuclear Waste Management Fund was decreased by EUR 74.8 (March 31, 2018 increased by 10.7) million.

The OL3 EPR project's share of financing costs has been capitalized in the balance sheet.

Share capital

TVO'S share capital on December 31, 2019 was EUR 600.4 (600.4) million.

The Company has 1,394,283,730 (1,394,283,730) shares, of which 680,000,000 belong to the A series, 680,000,000 to the B series, and 34,283,730 to the C series. The A series shares entitle to electricity generated at the OL1 and OL2 units, and the B series shares to the electricity generated at the OL3 unit. The C series owners have the right to acquire electricity generated by TVO's share of the Meri-Pori coal-fired power plant.

Administrative principles

BECAUSE TVO is a non-listed public company applying the cost-price principle, it observes the Corporate Governance Code for listed companies where applicable. TVO is not obligated to observe the Corporate Governance Code nor therefore its Comply or Explain principle. According to the 7 § of 7th Chapter of the Securities Market Act (746/2012), the issuer of a security subject to public trading must provide a Corporate Governance Statement in its Annual Report or separately. TVO has given a separate Corporate Governance Statement which is published on the Company's website (www.tvo.fi/financialpublications) at the same time as this Report of the Board of Directors.

Administrative bodies

TVO'S administrative bodies and their operations in 2019 have been described in a separate Corporate Governance Statement to be found in the Company's website www.tvo.fi/financialpublications.

Regulatory environment

THE BASIC principle of nuclear energy legislation is that the use of nuclear energy must be in line with the overall good of society. The key regulations governing the use of nuclear energy, the monitoring of its use and nuclear safety are included in the Nuclear Energy Act and the Nuclear Energy Decree as well as in subordinate regulations issued by them, such as YVL Guides and regulations by the Radiation and Nuclear Safety Authority in Finland (STUK). In addition to these, regulations applied to the use of nuclear energy are included e.g. in the Radiation Act.

In April 2018, the Ministry of Economic Affairs and Employment (MEAE) set up a working group to detect the deficiencies in the regulatory environment of investment activity of the Finnish State Nuclear Waste Management Fund and to execute the possible amendments. The term of the working group lasted until June 2019 and the final report was published in September 2019. The aim is to prepare the renewal of the regulation of the Finnish State Nuclear Waste Management Fund and especially its investing operations as partial renewal of the Nuclear Energy Act during 2020.

In November 2018, the MEAE submitted a draft proposal on amending the Nuclear Energy Act and Security Clearance Act. The pivotal objective of the proposal is to enhance nuclear and radiation safety by developing regulations on security arrangements. The introduction of the proposal to the Finnish Government has been delayed, and according to the current information, it will take place during the first half of 2020.

In October 2019, the MEAE set up a working group to prepare a comprehensive renewal of the Nuclear Energy Act. The aim is to renew the regulation of the usage of nuclear energy related to nuclear plants to a modern, clear and consistent entity, which fulfills the changed requirements of the constitution and EU regulation as well as anticipated needs. The term of the working group is from 21 October 2019 to 18 June 2020.

Radiation and Nuclear Safety Authority’s Regulatory Guides on nuclear safety (YVL Guides) currently in force were enforced in OL1 and OL2 during 2015. YVL Guides were mainly enforced at the OL3 EPR primarily after the operating license was granted. STUK has continued its development work by updating the YVL Guides during 2018 and 2019. In 2019, STUK published 32 updated guides in total. STUK will publish the remaining updates – 13 guides in total – during 2020. Thus, all the guides will be entering into force in 2020. TVO’s fulfillment of YVL requirements is indicated in its plant unit-specific statements.

In addition, the Nuclear Liability Act concerns the liability the operator of a nuclear plant has in the event of a nuclear accident. A temporary amendment to the Nuclear Liability Act came into force as of the beginning of 2012. According to the temporary amendment, the plant operator’s liability for a nuclear incident in Finland is unlimited but limited to a maximum amount of 600 million Special Drawing Rights (SDR), corresponding to EUR 700 million, for nuclear damage outside of Finland. The operator has to have insurance for up to a minimum of 600 million SDR. The OL3 plant unit’s fuel was included in the nuclear liability insurance in autumn 2017 and primary neutron sources in December 2018. In addition, TVO has made an agreement with nuclear responsibility insurers on a mechanism which takes OL3 EPR into account in nuclear responsibility insurances after the loading of nuclear fuel has been completed.

The use of nuclear energy is subject to license. Applications for a decision-in-principle, construction license and operating license, as well as the new, upcoming license for decommissioning a nuclear power plant are made to the Finnish Government. The Radiation and Nuclear Safety Authority of Finland (STUK) is responsible for monitoring the safety of nuclear energy use, and it also supervises safety and emergency arrangements and nuclear material safeguards.

Risk management, major risks and uncertainties

Risk management

THE OBJECTIVE of risk management is to support the realization of TVO's strategy and business objectives, and to ensure that TVO's operational preconditions are maintained. Risk management is carried out comprehensively according to the strategic objectives set by the Board of Directors, company-level policies and good governance.

Risk management is supervised by the Company's Board of Directors, which also verifies the Company's risk management policy. The Board of Directors of each affiliate company supervises risk management of the affiliate company and verifies that the company's risk management policy is in line with TVO's policies. The President and CEO, with the help of the Company's Management Group, is in charge of risk management in accordance with TVO's objectives and strategy. Under the Management Group operates a risk management group, which is in charge of ensuring adequate risk treatment in the Company and also for confirming the implementation of risk management measures.

Each organization unit is responsible for the identification, analysis and treatment of risks connected to its operations, as well as the follow-up of measures. Risk identification is carried out as part of TVO's strategic and operational planning and follow-up and also as part of project management.

Risk management process

TVO has a group-wide risk management process, used to ensure that risks facing the Company's operations are systematically identified and each risk is treated according to its severity. The objective of the risk management process is to either prevent the risk from materializing or to reduce its likelihood or consequences. The acknowledged risks are gathered to a company-level risk register, where all the risks and their significance are displayed in accordance of each risk's consequence and likelihood. All risks are reported to the company's Management Group, Audit and Finance Committee and the Board of Directors in accordance with the annual management program.

The comprehensive development of risk management is evaluated with the help of the annually prepared risk management evaluation, which is used to set the goals for the development of risk management. Risk management evaluation is implemented in accordance with a model based on risk maturity levels.

In 2019, TVO's management and operational planning process continued to increase the integration of risk management. Risk management is a part of the Group's strategy and, as such, it is being developed to help meet the Group's objectives with an acceptable risk level. TVO Group's project management processes and risk management's role were increased during the year 2019 as part of the investment process.

Major risks and uncertainties

THE RISKS related to safety and electricity production are reduced by keeping the plant units in good condition. Safe and reliable production is ensured by efficient life-cycle management of the plant units and high-quality planning and implementation of the annual outages.

Fuel used in the electricity production, uranium and coal, is bought on the global market. Risks connected with nuclear fuel have been reduced by purchasing the fuel from a variety of suppliers and by making long-term contracts.

At the OL3 EPR project, risk management is primarily a question of overseeing and guiding the work of the Supplier according to the terms of the turnkey contract and the settlement agreement.

Indemnity and property risks are covered with insurances. The aim of insurance management is to keep the scope, cover and cost of insurance at an acceptable level. TVO is a member of European mutual associations for nuclear insurance. Statutory liability insurance is in force for nuclear liability.

There are no major risks or uncertainties in view concerning electricity production at OL1 and OL2 plant units.

Financial risk management and fuel price risks are dealt with in the notes to the consolidated financial statements, note 27: Financial Risk Management.

RISKS RELATED TO OL3 EPR PROJECT

Schedule and planned completion

TVO's major risks are related to the schedule the OL3 EPR project, the consortium company Areva's sufficient financial capacity to fulfil its obligations until the end of the guarantee period, and the profit-yielding capacity of the OL3 EPR project. Under the plant contract, electricity production was scheduled to start at the end of April 2009. The completion of the project, however, has been delayed. According to the schedule last updated by the Plant Supplier in December 2019, regular electricity production at the unit will commence in March 2021.

The risk related to the planned completion refers to a situation in which commercial use cannot be launched as planned, which leads to additional costs.

During 2019, several risk management measures related to the OL3 EPR project have been executed to improve TVO's readiness to commission the OL3 EPR plant unit as well as operate three nuclear power plant units. TVO closely monitors compliance with the conditions set in the settlement agreement in March 2018 and ascertains that the commissioning of OL3 EPR plant unit is executed according the schedule provided by the Plant Supplier and that financial and technical resources are secured.

Profit-yielding capacity of OL3

If the OL3 EPR project fails to reach the projected output level, load factor or operating cost structure or if the output level is restricted by the main grid, there is a risk that the production cost will rise in comparison to the objective. This risk has been analyzed with the help of various scenarios influencing OL3's profit-yielding capacity.

As risk management measures, TVO as a licensee ensures, among other things, that the OL3 EPR plant unit has undergone extensive functional testing before nuclear test operations are launched. TVO will ensure that the experiences from the Taishan sister plants are utilized during nuclear commissioning of the OL3 EPR plant unit.

MAJOR PLANT MODIFICATIONS AND THEIR IMPLEMENTATION

Increase of production costs and deterioration of profitability may be consequences of failed implementation of plant modifications. In major large-scale plant modification projects, it is important to establish and assign responsibility for requirements related to nuclear safety and to ensure that the project parties meet these requirements in advance to avoid unexpected costs during the project.

In risk assessment analysis, increased project costs are viewed to arise either from inadequate preparation and requirement specifications, major unpredicted technical issues, challenges in the execution of the licensing process or deficiencies in project management and control.

As risk management measures, TVO has in 2019 continued to prioritize projects and measures that are most vital in view of the schedule and costs to secure adequate resourcing for them. Furthermore, TVO aims to ensure that project suppliers have the readiness and interests to complete the projects they are involved in.

ORGANIZATION'S CAPABILITIES

An organization's competence and ability to function as a licensee may be compromised by dysfunctional management, failed reaction to changes in the operational environment or negative atmosphere of the work community. In addition to the rise of immediate costs, this may also lead to an increased likelihood of other risks being realized.

In order to maintain its capability to function as a licensee, TVO has prepared for the operation phase of the Olkiluoto 3 EPR plant unit and for future retirements by recruiting 129 new staff members in 2019 and by maintaining a comprehensive supplier chain. Furthermore, TVO has also executed a competence survey project, the results of which are used for personnel planning. OL3 EPR trainings have continued during 2019. TVO has also undertaken measures to further develop its work community culture and to strengthen its safety culture. TVO implements a personnel survey approximately every 18 months and the results of the latest survey were received in February 2020.

FINANCIAL AND LIQUIDITY RISKS

The financing risks of TVO's business include liquidity, market and credit risks. By diversifying sources of finance, and with long-term credit commitments and liquid funds, financing risks are reduced. The financial position has been strengthened by issuing long-term private placements and bonds and by bilateral bank loans. TVO has reduced market risks by making use of interest rate and currency derivatives. According to the Company's financing policy, the loans denominated in foreign currencies will be hedged to the euro until the maturity date by using derivatives.

Financing costs are impacted by the changes in TVO's credit rating and outlooks as well as market changes to interest rates and corporate loan margins. There is a risk of a significant rise in financing costs from their current level. This risk has been analyzed through various scenarios based on the changes in the average interest rate and margin of TVO's loan portfolio. If the risk is realized, the consequences include increased cost of financing and thus an increase in production costs.

TVO's financing situation has developed as planned as the Company utilizes a variety of financing sources in diverse ways. In addition to the international capital market, the Company also acquires long-term financing from banks and other financial institutions. Credit ratings play a major role in capital market financing.

Financing is used to secure TVO's liquidity under all circumstances. For this purpose, the Company maintains significant liquidity buffers in form of various revolving credit facilities and liquid assets. It is TVO's basic principle to acquire about three quarters of its financing from the financial market and one quarter from its shareholders. TVO aims to maintain long-term financial arrangements and financing is arranged for the Company, not for separate projects.

Solid trust of shareholders, banks and investors in TVO's operations have remained strong also in 2019. This is reflected in the shareholder loan commitments to complete the OL3 project, significant revolving credit facilities, and successful bond issues.

INCREASE IN THE COST OF FINAL DISPOSAL OF SPENT NUCLEAR FUEL

If Posiva's final disposal project EKA is not implemented according to plan, project costs rise, or the completion of the project is delayed, the cost estimate of final disposal will rise, which in turn will influence the amount of the existing nuclear waste management liability of spent fuel.

As a risk management measure, the cost estimate was specified during 2019. The most significant industrialization measures related to final disposal were defined, and suppliers' readiness and interests with regard to the completion of the EKA project in planned schedule and budget was assessed.

RISKS RELATED TO SOCIAL AND PERSONNEL MATTERS, RESPECT OF HUMAN RIGHTS AND RISKS RELATED TO CORRUPTION AND BRIBERY

Risks related to social and personnel matters and respect of human rights, as well as the risks related to corruption and bribery constitute one area of the Company's risk assessment. No significant risks affecting the Company's operations have been detected on forementioned matters during 2019. The possible risks detected on these areas are addressed according to the Company's ordinary risk management process.

Continuous risk management in these matters is executed according to TVO's Code of Conduct. Internal auditor, assigned by the Board of Directors, supervises that the Code of Conduct is carried out in the Company's operations. The possible risks are evaluated in projects and investments as necessary. In addition, these matters are evaluated in reviewing suppliers in accordance to a separate supplier-review procedure. TVO's principles and results of ethical business are described more specifically in the chapter on Responsibility.

Pending court cases and disputes

TVO and Wärtsilä Finland Oy (Wärtsilä) signed an agreement on the delivery of Emergency Diesel Generators and their auxiliary systems to Olkiluoto nuclear power plant (the so-called EDG project) in 2013. In December 2018, Wärtsilä published a stock exchange release announcing a major provision it has made on two nuclear power plant projects to cover the excess costs and project delays, and stating that the allocation of responsibility for the additional costs and delays is in dispute. In April 2019, Wärtsilä announced in its notification addressed to TVO that EUR 65.0 million of the provision applies to TVO's EDG project. In addition, Wärtsilä announced that internal clearance on the costs that will be demanded from TVO is still ongoing. At the end of the year, the status of the dispute was unchanged.

Nuclear power

TVO owns and operates two nuclear power plant units, Olkiluoto 1 (OL1) and Olkiluoto 2 (OL2), and is building a new plant unit, Olkiluoto 3 EPR (OL3 EPR) at Olkiluoto in Eurajoki, Finland.

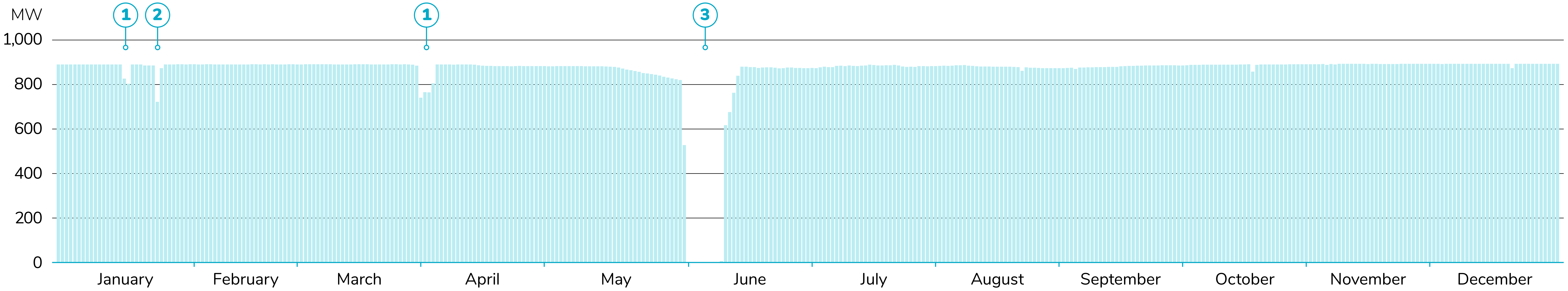
Olkiluoto 1 and Olkiluoto 2

The electricity production of the Olkiluoto power plant units, OL1 and OL2, during 2019 was 14,751 (14,089) GWh, which is the second highest production amount ever. The total load factor was 94.8 (91.1)%.

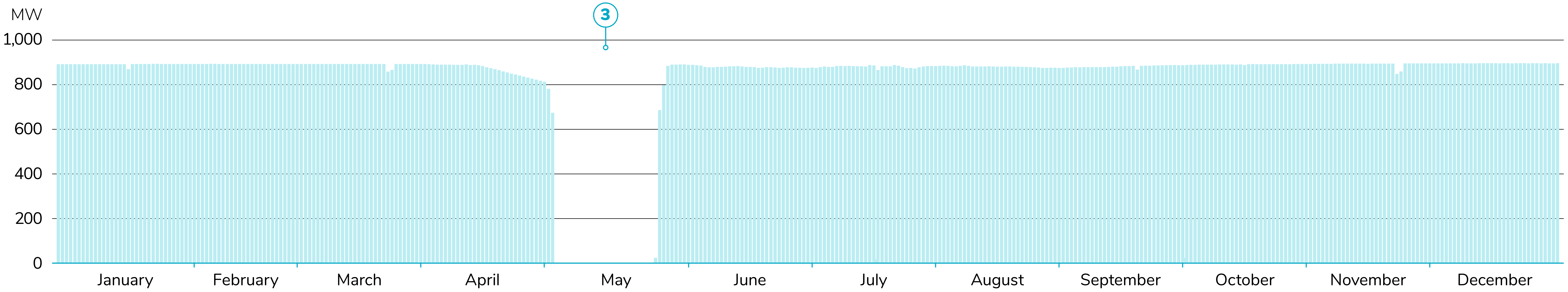
The plant units operated safely. OL1's net production was the best in the plant unit's history 7,542 (6,755) GWh and load factor 96.9 (87.8)%. OL2's net production was 7,209 (7,334) GWh and load factor 92.7 (94.3)%. The production volume and load factor of OL2 remained lower compared to previous years due to a longer annual outage.

In September 2018, the Finnish Government approved the extension of operating licenses for OL1 and OL2 plant units to be continued up till the year

OL1 Production
Average output MW



OL2 Production
Average output MW



1. Repair of Feed Water Pump
2. Valve leakage repair work in reheater system
3. Outage

2038. According to STUK, the operation carried out by TVO is safe and conforms with the law, and the Company has the required capabilities, procedures, expertise and resources for the safe continuation of the operation of the OL1 and OL2 plant units up till the year 2038.

Annual outages

The refueling and maintenance outages carried out at the plant units on alternating years are designed to ensure that a good level of operability and production is maintained at the Olkiluoto nuclear power plant at all times.

The 2019 annual outages of the Olkiluoto nuclear power plant were started with a maintenance outage at OL2 plant unit on 1 May. The plant unit's outage was brought forward by four days to remove damaged fuel from the reactor. Damaged fuel assemblies were removed from the reactor and replaced with fresh fuel. In addition to refueling, significant works at OL2 included the pressure test of the primary circuit and renewal of the heat exchanger in the purification system for reactor water. Also, Fingrid's 400 kV switchgear was taken into use during the outage. The outage took 25 days and the plant unit was connected to the grid as planned on 26 May.

The annual outage carried out at the OL1 plant unit was a refueling outage. The outage was started on 2 June, and it was completed within the planned schedule on 11 June.

In addition to TVO's own personnel, up to 850 contractor employees took part in the outage works.

Olkiluoto 3 EPR

Olkiluoto 3 EPR (OL3 EPR), currently under construction, was procured as a fixed-price turnkey project from a consortium (Plant Supplier) formed by Areva GmbH, Areva NP SAS and Siemens AG. As stipulated in the plant contract, the consortium companies have joint and several liability for the contractual obligations.

In December 2019, TVO received an updated schedule for the commissioning of the OL3 EPR plant unit from the Plant Supplier. According to the received information, nuclear fuel will be loaded into the reactor in June 2020, the first connection to the grid will take place in November 2020, and the start of regular electricity production of the OL3 EPR nuclear power plant unit will take place in March 2021. According to the commissioning program, the unit will produce 1–3 terawatt hours with varying power levels during the test program, which will begin upon the connection to the grid and will end at the beginning of regular electricity production.

Most of the construction works for the plant unit have been completed. The installation of the electrical systems, the instrumentation and control system (I&C), and mechanical systems is still in progress. The operating personnel was granted operator licenses by Radiation and Nuclear Safety Authority (STUK) in the end of 2018. During the hot functional testing (HFT) in spring 2018, it was noticed that the pressurizer surge line vibrates. In May 2019, STUK approved the solution to eliminate the vibration and the absorbers have been installed in their places. STUK will approve the structures of the absorbers before nuclear fuel is loaded into the reactor.

The Finnish Government granted operating license for OL3 EPR plant unit in March 2019. The workforce at the site at the end of the period under review was about 1,700 persons. Occupational safety at the site remained at a good level.

In December 2019, the Plant Supplier paid the second installment amounting to EUR 122.0 million of financial compensation agreed in the comprehensive settlement agreement in 2018.

All realized costs of the OL3 EPR project that can be recognized in the cost of the asset have been entered as property, plant and equipment in the Group balance sheet.

Nuclear fuel

In 2019, the nuclear fuel purchases amounted to EUR 68.5 (68.8) million and the amount consumed to EUR 59.5 (57.7) million.

The nuclear fuel and uranium stock carrying value on December 31, 2019 was EUR 261.9 (252.8) million.

Nuclear waste management

Under the Finnish Nuclear Energy Act, the Company is responsible for the measures related to nuclear waste management and the related costs.

The liabilities in the consolidated financial statement show a provision related to nuclear waste management liability of EUR 1,040.8 (952.0) million, calculated according to the international IFRS accounting principles. A corresponding amount, under assets, represents the Company's share in the Finnish State Nuclear Waste Management Fund.

In order to cover the costs of nuclear waste management, TVO makes contributions to the Finnish State Nuclear Waste Management Fund. In November 2019, MEAE set TVO's liability for nuclear waste management at EUR 1,471.4 (1,505.8) million to the end of 2019 and the Company's funding target for 2019 at EUR 1,471.4 (1,505.8) million.

In March 2019, the Finnish State Nuclear Waste Management Fund confirmed TVO's nuclear waste management fee for 2018 at EUR 26.7 (33.6) million, which was paid into the Fund on March 29, 2019 (March 31, 2018).

The nuclear waste management liability of TVO is lower at the end of 2019 than in the previous year based on the decrease of nuclear waste management's total cost estimate updated every three years. Thus, assets will be refunded from the Nuclear Waste Management Fund to TVO in respect of 2019 according to the rules of the Fund. The refund has a decreasing effect on the production cost of OL1 and OL2 plant units in 2019. The final refunded amount of the nuclear waste management fee of 2019 will be confirmed in March 2020.

A total of 8,371 (8,214) m^3 of low- and medium-level radioactive waste has accumulated from the OL1 and OL2 plant units during their operation. During 2019, the amount of waste increased by approximately 157 m^3. The waste is disposed of in the final repository for low- and medium-level waste (VLJ repository) in Olkiluoto.

The total amount of spent nuclear fuel by the end of the year was 1,565 (1,531) tons, of which 35 (33) tons accumulated in 2019. The spent fuel is stored in the fuel pools of the plant units and in an interim storage facility (the KPA storage facility) at Olkiluoto.

FINAL DISPOSAL OF SPENT NUCLEAR FUEL

Posiva Oy is responsible for the final disposal of spent nuclear fuel generated at the power plants of its owners, TVO (Olkiluoto NPP) and Fortum (Loviisa NPP).

Posiva's final disposal project progressed in 2019 to a new phase, when the Board of Directors of the Company made a decision on the construction of the encapsulation plant and underground final disposal facility designed for the final disposal of spent fuel. The EKA project entails the implementation of the encapsulation plant as a whole and the additional excavations required for the final disposal repository, the installation of the systems needed for the start of final disposal, the operating license process, and setting up the supply chains necessary for production operation.

The foundation stone of the encapsulation plant was laid in September 2019, with the Finnish Prime Minister in attendance. The progress made in the construction project included concreting works for frame systems. The foundations and the first-floor slabs were poured, as well as walls up to 2.9 meters above sea level. The suppliers of most of the main equipment for the encapsulation plant have been selected and the design phase of the plant's main equipment proceeded on schedule.

The excavation of the first two safety-classified central tunnels started in the underground final disposal repository, including also entrances to the first deposition tunnels branching out from the central tunnels. The reinforcement project of the personnel shaft progressed to two-thirds of completion. Contracts have been awarded for the steel structures and piping systems of the personnel shaft as well as for the reinforcement of the canister shaft. In addition, work related to the building and HVAC systems needed to start the final disposal operation has started in ONKALO.

Installations needed in the Full Scale In Situ System Test (FISST) of final disposal were completed in June. The FISST test is designed to demonstrate that Posiva's concept for safe final disposal can be implemented according to plans. The monitoring phase of the test continues for several years.

In early 2019, Posiva introduced a new operations model designed to streamline the decision-making process in programs and projects and to ensure that the expertise of all project participants is used efficiently. The project organization based on the updated operations model was set up in April.

Posiva's production processes, subcontractor chains and cost estimates were made more specific. Using them as the basis, decisions were taken to carry out industrialization actions aimed at achieving greater simplicity of the processes and improving the suitability of the engineered barriers used in final disposal for manufacturing and installation.

Posiva's owners submitted the annual report on nuclear waste management in 2018 to the Ministry of Economic Affairs and Employment at the end of March. The nuclear waste management scheme which presents the estimated management costs for the years 2019–2021 and preliminary estimates for the years 2022–2023 was submitted to the Ministry in the summer.

Coal power

TVO has a 45 percent holding in the Meri-Pori coal-fired power plant owned and operated by Fortum Power and Heat Oy. Fortum bought from other TVO stakeholders TVO's share of Meri-Pori's power capacity and acquired the capacity in its use in the beginning of 2019. TVO will renounce its share of Meri-Pori's capacity in the beginning of July 2020.

Meri-Pori

The amount of electricity produced by TVO's share at the Meri-Pori coal-fired power plant in 2019 was 181.7 (659.7) GWh requiring 65.9 (242.2) thousand tons of coal and 160.2 (524.3) thousand tons of carbon dioxide emission rights.

Research and development

RESEARCH AND DEVELOPMENT costs were EUR 14.7 (15.7) million, most of which was used for R&D activities related to nuclear waste management.

TVO is a significant financier of Finnish public sector research programs for reactor safety and nuclear waste management. In 2019, TVO's contribution to the Finnish State Nuclear Waste Management Fund, which finances such programs, amounted to EUR 7.3 (7.2) million.

Acquisitions of tangible and intangible assets and shares

INVESTMENTS in 2019 were EUR 369.5 (181.2) million. Investments of the parent company were EUR 278.2 (176.7) million, of which EUR 224.8 (107.9) million were allocated to the OL3 EPR project.

Carbon dioxide emission allowances have been relinquished to the Energy Authority worth EUR 10.2 (0.7) million. In 2019, emission allowances were acquired worth EUR 5.1 (8.7) million. The Company's need for carbon dioxide emission allowances for the period under review was covered by acquired emission allowances.

Responsibility

RESPONSIBILITY is one of the Company's core values. For TVO the most important aspects of responsibility include a safety culture of a high standard, the supply of electricity to the Finnish people, a positive impact on the climate, safeguarding shareholder value and a good work community.

TVO Group and its entire personnel are committed to a high standard safety culture (see: chapter Safety).

TVO Group-level policies, approved by the Management Group, outline key objectives related to responsible operations. Group-level policies include:

- Nuclear safety and quality policy (nuclear safety, radiation protection, nuclear material safeguards and quality)
- Corporate social responsibility policy (environment and energy efficiency, procurement, personnel, occupational safety and communications)
- Production policy (plant operation and maintenance as well as increasing the production capacity)
- Corporate safety policy (safety of production and activities as well as the safety of people and facilities, rescue and emergency activities and data security).

TVO's principles of responsible business operations are described in TVO's Code of Conduct, which is approved by the Company's Board of Directors and applies to the entire personnel as well as all partners and subcontractors. TVO's Code of Conduct complies with OECD's Guidelines for Multinational Enterprises. TVO considers any non-compliance with its Code of Conduct unacceptable. The Code of Conduct is a part of the training requirements of all TVO employees and is included in Company's Terms of Procurement. Code of Conduct training was completed by 347 persons in total in 2019. The Code of Conduct is published on TVO's website.

TVO has committed to promote the following of the United Nations Sustainable Development Goals in its actions:

TVO reports on its corporate social responsibility in accordance with the core extent of Global Reporting Initiative (GRI) Standards. TVO's Responsibility report is published on the Company's webpage www.tvo.fi/financialpublications. TVO's Responsibility report has been subjected to a limited audit by an external party. The information in the Environmental report included in the Responsibility report has been verified by an external party.

OBJECTIVES AND RESULTS OF TVO'S RESPONSIBILITY PROGRAM

Objectives of responsibility are based on the principle of continuous improvement. The objectives enable the company to monitor the realization of major responsibility issues.

	Objective 2019	Actual 2019
Reputation index	75	77
Personnel survey, category	-*	-*
Reports suspecting violations of the Company's Code of Conduct	-	3
Sick leaves, %	<2.2	2.6
Occupational accident frequency	<3.2	4.0
Collective radiation dose, manmSv	922.87	646.61
Number of environmental incidents, pcs	0	2**
Unplanned energy unavailability factor, %	0	0.7
Number of unplanned automatic scrams, pcs	0	0

Reputation index: TVO Group stakeholder survey, average of respondent groups 0–100; under 50 = Weak, 50–62 = Moderate, 62–70 = Good, over 70 = Excellent. The survey is conducted and the results are reported in every two years. The next survey will be conducted in 2021.
***Personnel survey:** Personnel survey was conducted in the end of 2019. The results were reported in February 2020. The survey is conducted every 18 months.
Occupational accident frequency: per million working hours. The indicator is Group-level.
Collective radiation dose: World Association of Nuclear Operators (WANO) indicator. Reference point: other WANO members' NPPs. Goal: the best quarter.
Environmental incidents: in class considerable/severe. **The other incident happened at Fingrid's converter.
Unplanned energy unavailability factor: % of total production.

IMPLEMENTATION OF NUCLEAR PROFESSIONALISM CONTINUED

The principles of management and working policies in nuclear power plants have been developed by defining and reinforcing the expectations for nuclear professionals i.e. the expectations for working in a nuclear plant. The expectations were also included in TVO's Management System.

Reinforcing of the expectations of nuclear professionalism was continued in 2019. Self-assessments, work satisfaction, defined safety indicators and external peer reviews illustrate that the development has been in line with the objectives set for the principles of nuclear professionalism. The implementation of nuclear professionalism will be continued in 2020.

RESULTS OF ETHICAL BUSINESS

TVO does not tolerate any kind of corruption or bribery. The Code of Conduct requires employees to refrain from transactions and retreat from situations that could cause a conflict between the interests of the Company and the individual. The Company maintains a register on the engagements of specified individuals. TVO also has specific instructions regarding hospitality practices and the processing of insider information. Detailed instructions are available regarding the approval procedure of TVO's commitments (procurement agreements, orders, invoices, etc.).

TVO respects the human rights of all people affected by the Company's operations and expects the same from all companies acting in its supply and subcontracting chains. TVO's objective is to guarantee good working conditions for all employees. In accordance with its Code of Conduct, TVO does not condone any kind of discrimination or harassment on the grounds of age, gender, ethnic origin, religion, beliefs, opinions or other personal characteristics. TVO observes an equality and equal opportunity plan.

All personnel, partner and subcontractor activities at Olkiluoto are supervised by TVO. TVO only trades with approved suppliers. All products and services acquired must meet the requirements of TVO's safety, quality and environmental standards as well as the principles of responsible business described in the Company's Code of Conduct. TVO's supplier review process also includes active monitoring and periodical reviewing of suppliers. Through supplier reviews the Company ensures that suppliers follow good practices on environmental, personnel and quality management related issues. During 2019, 145 suppliers were reviewed using various methods.

TVO has a procedure for reporting suspected violations of the Company's Code of Conduct and abuses of insider information. The report can also be filed anonymously. TVO's internal audit processes all concerns regarding possible violations against the Code of Conduct or abuses of insider information in such a manner that the rights and the privacy of both the person raising the concern and the alleged violator are protected under all circumstances.

Internal audit investigated three notifications of possible violations against TVO's Code of Conduct in 2019 and implemented necessary actions.

Safety and occupational safety

SAFETY

Safe use 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 of the ISO 9001 standard. In order to ensure safe operation, TVO systematically estimates the level of safety and safety culture, and all TVO personnel are committed to observing a high-quality safety culture.

TVO regularly assesses the state of its overall safety from the viewpoints of production, nuclear safety, safety and service life management as well as management, organization and personnel. The overall level of safety is good.

The state of the safety culture is regularly assessed according to the International Atomic Energy Agency (IAEA) procedure. TVO's safety culture is estimated to be at a level at which the strategic importance of safety has been recognized and preventative practices are observed. TVO aims at reaching the highest possible level of safety culture. TVO has continued to employ various measures to maintain and develop the Company's safety culture.

The Company regularly assesses the operations of its plant units with the help of internationally used safety indicators. Of the safety indicators, collective radiation dose, unplanned energy unavailability factor and unplanned automatic scrams realization are described in the table "Objectives and results of TVO's responsibility principle" (see chapter: Responsibility).

The Olkiluoto nuclear power plant units, OL1 and OL2, operated safely throughout the year. TVO classifies events affecting nuclear safety in accordance with the international INES scale (0–7). In 2019, the Olkiluoto nuclear power plant had 6 INES classified issues, of which all were classified as level 0 (No safety significance). In case of special situations and operational disruptions, the Company submits separate, incident-specific reports to the Radiation and Nuclear Safety Authority of Finland (STUK) with a plan for corrective measures. TVO publishes information on every significant event with public interest in the News section of the Company's website.

OCCUPATIONAL SAFETY

Occupational health and safety activity is guided by an OHSAS 18001 certified occupational health and safety system, which also includes construction operations at the OL3 EPR site in the areas where TVO is responsible. In 2018, TVO commenced a project to renew its occupational health and safety system to meet the requirements of the ISO 45001 standard. The objective of the project is also to unify TVO's and Posiva's occupational safety systems. The project continued in 2019 and certification of the new system will take place in February 2020.

The mission of the Occupational safety organization is to support, monitor and develop occupational safety activities and to help the organization to succeed in occupational safety. The group-level goal of occupational safety in 2019 was to create preconditions for the ISO 45001 certification for a unified occupational safety system, to clarify occupational safety responsibilities in the organization, to support team managers and to develop danger recognition and risk management.

The Company's accident frequency in 2019 was 4.0 (accidents per million work hours), which did not meet the Company's goal of less than 3.2 accidents per million work hours. TVO personnel, Posiva personnel and all contractors working in Olkiluoto are included in the accident frequency calculation, excluding OL3 site, which is reported by the Plant Supplier Consortium AREVA-Siemens.

Key occupational safety figures for 2019 are reported in further detail in the corporate responsibility and environmental reporting.

The environment

TVO is committed to observing the principles of sustainable development, and environmental responsibility is a part of the Company's management system. The Company's environmental management system meets the requirements of the international ISO 14001 standard and the energy efficiency system. Its goal is continuous improvement and raising the level of environmental protection. The system is also Eco-Management and Audit Scheme (EMAS) registered.

TVO recognizes the environmental and energy aspects of its operations and works to minimize their negative impacts at all stages of the electricity production chain. Risks related to the environment have also been recognized and no significant risks influencing operations were detected in risk analysis. Through risk management operations, the Company aims to foresee possible divergent situations and to mitigate their effects to the environment. TVO constantly monitors the environmental impacts of its operations.

The Company's operations met the requirements set in legislation, environmental permits and the environmental management system in 2019. The most significant environmental impacts of the Olkiluoto nuclear power plant are the production of climate friendly electricity and the local warming of the sea water near the plant. During the year under review, the electricity production of Olkiluoto NPP was 14.75 TWh and the temperature of cooling water remained within the limits required by the environmental permit.

As in previous years, the environmental load caused by the Olkiluoto nuclear power plant was minimal in 2019. Radioactive emissions into the atmosphere and water were below regulatory limits.

In Autumn 2019, a malfunction was noticed in the liquid waste management system of OL1 plant unit, which disabled the use of the evaporator designed for the treatment of wastewater, and the purifying was done by filtering instead. Filtering is not as effective a purification method as evaporation. As a result of this, minimal concentrations of radioactive substances were measured in the sea area, which were insignificant for humans and environment. Repairing of the liquid waste management system was completed in December.

In the beginning of 2019, TVO itself detected that the collection efficiency of the sampling system was not taken into account in the calculation of aerosol releases in the emission reporting of OL1 and OL2 usage history. Thus, the results reported earlier will be specified later, after the revision of the efficiency of the sampling system has been completed. The effect of aerosol releases to the calculated annual environmental dose is insignificantly small.

In addition, a cooling agent leak was detected in a diesel-verified switchboards' cooling water system at OL3 EPR plant unit. The leak has been repaired and environment officials have been notified.

Operations were developed in accordance with the regulations of environmental permits and the environmental management system. In accordance with the principle of continuous improvement, the environmental management system sets goals for the Company's operations. The system is regularly monitored by an environmental team consisting of experts from various fields. TVO is also involved in the energy efficiency agreement. The Company's total energy savings target for the agreement period 2017–2025 is 150 GWh.

Environmental issues from 2019 and key figures related to the environment as well as the results of the environmental program are reported in further detail in the corporate social responsibility and environmental reporting. The information has been verified by an external party.

Group personnel and training

PERSONNEL

TVO's Code of Conduct and group-level policies lay down the principles of the Company's personnel policy. TVO aims to provide a healthy, equal work community that promotes equality and does not condone any form of discrimination.

At the year-end, the total number of personnel in the Group was 942 (878), and the average during the year was 943 (872). The year-end total number of personnel in TVO was 941 (877), and the average during the year was 942 (871). The year-end total for permanent personnel was 922 (862).

TVO recruited 129 (134) employees in 2019. During the year, 56 (55) permanent employees left the Company, including 13 (9) who retired. TVO's sick leave percentage was 2.6 (3.1).

The collective agreements for different groups of personnel in the energy industry are in force in accordance with the so-called framework agreement of labor confederations until beginning of 2020. 100% of TVO employees are working under collective agreement.

Personnel performance and workload are monitored in navigation discussions held three times a year. Personnel admission and exit interviews are held at all levels of the Group. Supervisors are instructed in the general and professional induction training of new employees before new recruits begin their work. Summaries are drawn of both admission interviews of new employees and exit interviews of personnel leaving the Company and the results are utilized in developing operations.

As the operating phase of OL3 EPR is approaching, technical services and electricity production organizations were reinforced with several dozens of technical professionals. Considerable investments were made in personnel training that supports the Olkiluoto integration, and the number of realized training days was considerably larger than that of the same time during the previous year.

The Group's management and operational culture is being developed with the help of the Better workplace program. The goals of the program include improving efficiency of operations and securing good preconditions for operations by developing issues related to the work of each individual, the immediate work community and the entire Group. The progress of the program is monitored on a regular basis and the effectiveness is measured with e.g. regular personnel surveys. In 2019, the focus has been, among other things, on promoting actions related to nuclear professionalism, on clarifying decision making, on developing cooperation and on developing actions of well-being at work and occupational safety.

The focus of occupational health care has been on preventative occupational health care, which supports the employee's health, work and functioning abilities as well as their maintenance and development.

The human resource issues and indicators for 2019 can be found in more detail in connection with corporate responsibility reporting.

TRAINING

The basic, continuing and further training of TVO employees was implemented according to the annual training program the same way as in previous years. Personnel were trained for a total of 12,237 (13,532) days, on average 13.0 (15.7) days per each TVO employee (including TVONS).

In 2019, OL1 and OL2 operators attended operational training days in the spring and in the autumn as well as advanced simulator courses according to their training program.

In 2019, OL3 operators attended an extended simulator course organized by the Supplier. In addition, OL3 operators attended to rehearsal training accordingly their training plan. Operators also attended in operator training days in spring and autumn. OL3 operators work in shifts in the combined operating organization of the Supplier and TVO, carrying out system operation and monitoring tasks. During 2019, OL3 operators also participated in the extensive review and validation work of OL3 operation instructions.

Everyone working in the Olkiluoto nuclear power plant area participates in induction training. The general part is intended for all persons working in the Olkiluoto area and the radiation part for those working in the controlled area. During 2019, a total of 3,193 (3,579) people took the general part of the induction training, and 1,707 (1,681) people the radiation protection part (those recorded by 17 January 2020). Both training courses were offered in Finnish and English. Both parts are also available for renewal in the external online learning environment in Finnish and English.

Basic know-how needed in annual outages was developed by two separate trainings. Virtual and mock-up training were a condition for access permission to the plant units. The objective of these trainings was to educate TVO staff and contractor workers on the expectations of TVO concerning work quality and correct procedures. 901 TVO staff, 1,530 contractor workers and 57 officials were trained. The total number of trained persons was 2,431 in 2019.

TVO took part in organizing a national course in the nuclear field as well as a special training in nuclear waste management together with other key operators of the industry. Through such courses, students gain a comprehensive idea of the nuclear industry and the key operating models used in the industry.

Nuclear professional trainings were taken into use for all TVO personnel and subcontractors. The trainings focus on essential procedures and expectations in nuclear industry.

Subsidiaries and joint ventures

TVO NUCLEAR SERVICES OY (TVONS) is a wholly-owned subsidiary of TVO. TVONS provides its customers with expertise in high-level nuclear safety, cost-effective operations, and nuclear waste management and services related to building new nuclear plants. The special expertise and networks of TVO personnel is at TVONS customers' disposal.

Posiva Oy, jointly owned by TVO and Fortum, is responsible for the research of the final disposal of spent nuclear fuel and implementation of the final repository of its shareholders' Olkiluoto and Loviisa NPPs. Posiva Solutions Oy (PSOY) is wholly-owned subsidiary of Posiva. As stated in its Articles of Association, PSOY provides nuclear waste management consultancy and planning, as well as research and development activity related to the industry.

Major events after the end of the year

NO MAJOR EVENTS after the end of the year.

Prospects for the future

ELECTRICITY production is expected to continue as in previous years. The prerequisites for nuclear power production at Olkiluoto are good. Nuclear fuel availability is guaranteed by long-term agreements.

Realization of the OL3 EPR nuclear power plant project and preparing the plant unit for production will be continued. TVO will continue the collaboration with the Plant Supplier to complete the OL3 EPR project according to the Supplier's plant ramp-up program, so that the fuel loading will be possible to implement in June 2020 as scheduled by the Plant Supplier, and OL3 EPR can be connected to the grid for the first time in November 2020. According to the commissioning program, the unit is expected to produce 1–3 terawatt hours with varying power levels during the test program, which will begin upon the connection to the grid and will end at the start of regular electricity production.

The Meri-Pori coal-fired power plant capacity will be used in accordance with Fortum's operation plan until June 2020. TVO will relinquish its share in Meri-Pori in full in the beginning of July 2020.

Posiva continues implementation of the EKA project in 2020. Excavation works will proceed in the first central tunnels, construction works of the encapsulation facility will continue to ground surface. Procurement will be focused on security classified systems and the criteria for Posiva's capability to submit an application for an operating license at the end of 2021.

Proposals to the Annual General Meeting

TEOLLISUUDEN VOIMA OYJ'S distributable equity as of December 31, 2019 amounted to EUR 14,460,000. The Board of Directors proposes to the Annual General Meeting that no dividend shall be paid.

Key figures of TVO Group

TVO Group (IFRS) (M€)	2019	2018	2017	2016	2015
Turnover	254	350	321	343	276
Profit/loss for the financial year	87	-18	-9	-11	5
Research expenses	15	16	16	14	17
Investments	369	181	299	265	345
Equity	1,819	1,745	1,667	1,589	1,612
Subordinated shareholder loans (hybrid equity) (included in the former) [2] [4]	679	679	579	479	479
Non-current and current interest-bearing liabilities (excluding loan from VYR) [1]	4,370	4,141	3,923	4,179	3,654
Loan from VYR	591	666	656	1,027	1,009
Provision related to nuclear waste management	1,041	952	953	955	971
Balance sheet total	7,942	7,662	7,354	7,952	7,464
Equity ratio, % [3]	28.8	28.9	29.0	26.6	29.4
Average number of personnel	943	872	801	765	794

[1] The Finnish State Nuclear Waste Management Fund (VYR)

[2] Subordinated loans

[3] Equity ratio % = 100 x $\frac{\text{equity + loans from equity holders of the company}}{\text{balance sheet total - provision related to nuclear waste management - loan from the Finnish State Nuclear Waste Management Fund}}$

[4] During the accounting period 2012, the terms of the loans of the equity holders of the Company have been changed and the loans are included in equity according to IFRS standards.

Consolidated adjusted profit/loss for the financial year (M€)	2019	2018	2017	2016	2015
Profit/loss for the financial year (IFRS)	87	-18	-9	-11	5
The impact of the nuclear waste management obligation [1] (profit -/loss +)	-80	22	18	17	3
Other IFRS adjustments	-1	-1	-1	-1	-1
Share of the profit/loss of joint ventures	-1	-1	-1	-2	0
Profit/loss before appropriations	5	2	7	3	7
Adjusted profit/loss for the financial year	5	2	7	3	7

[1] Includes profit/loss effects from nuclear waste management according to IFRS standard.

	2019	2018	2017	2016	2015
TVO's share in the Finnish State Nuclear Waste Management Fund (VYR) (M€)	1,514	1,480	1,437	1,380	1,358
TVO's funding target obligation to the Finnish State Nuclear Waste Management Fund	1,471	1,506	1,471	1,428	1,369
The carrying value of TVO's share in the Finnish State Nuclear Waste Management Fund (non-current assets)	1,041	952	953	955	971

The difference between the funding target and the share in the Finnish State Nuclear Waste Management Fund at the end of each year is due to the funding target being completed by paying the nuclear waste management fee only during the first quarter of the following year.

Key figures of Teollisuuden Voima Oyj (FAS)

Teollisuuden Voima Oyj (FAS) (M€) Parent company's financial statement has been prepared in accordance with the Finnish Accounting Standards (FAS).	2019	2018	2017	2016	2015
Turnover	251	346	316	340	273
Profit/loss before appropriations	5	1	6	3	7
Fuel costs	65	72	57	69	59
Nuclear waste management costs	-5	58	64	73	38
Capital expenditure (depreciation and financial income and expenses)	39	53	51	52	111
Investments	278	177	298	262	344
Equity	857	857	863	858	858
Appropriations	193	187	185	183	180
Non-current and current interest-bearing liabilities (excluding loan from VYR and loans from equity holders of the company) [1) 2)]	4,282	4,070	3,833	4,043	3,509
Loans from equity holders of the company [2)]	679	679	579	479	479
Loan from VYR	591	666	656	1,027	1,009
Balance sheet total	6,724	6,619	6,272	6,793	6,252
Equity ratio, % [3)]	28.2	29.0	29.0	26.4	28.9
Average number of personnel	942	871	800	764	791

[1)] The Finnish State Nuclear Waste Management Fund (VYR)

[2)] Subordinated loans

[3)] $\text{Equity ratio \%} = 100 \times \dfrac{\text{equity + appropriations + loans from equity holders of the company}}{\text{balance sheet total - loan from the Finnish State Nuclear Waste Management Fund}}$

Electricity delivered to equity holders of the company (GWh)	2019	2018	2017	2016	2015
Olkiluoto 1	7,531	6,742	7,144	7,035	7,387
Olkiluoto 2	7,198	7,321	6,241	7,288	6,851
Total Olkiluoto	14,729	14,063	13,385	14,323	14,238
Meri-Pori	182	660	131	563	167
Total	**14,911**	**14,723**	**13,516**	**14,886**	**14,405**

Capacity factors, %	2019	2018	2017	2016	2015
Olkiluoto 1	96.9	87.8	93.1	91.4	96.2
Olkiluoto 2	92.7	94.3	81.3	94.6	89.2
Total capacity factor	**94.8**	**91.1**	**87.2**	**93.0**	**92.7**

TVO share of the electricity used in Finland, %	2019	2018	2017	2016	2015
	17.3	16.9	15.8	17.5	17.5

TVO Group financial statements

Consolidated income statement

EUR 1,000	Note	1 Jan–31 Dec 2019	1 Jan–31 Dec 2018
Turnover	3	**254,208**	**350,271**
Work performed for own purpose	4	18,596	14,941
Other income	5	12,796	11,762
Materials and services	6	-81,966	-140,260
Personnel expenses	7	-67,787	-63,480
Depreciation and impairment charges	3, 8	-45,488	-55,181
Other expenses	9	-92,798	-103,401
Operating profit/loss		**-2,439**	**14,652**
Finance income	10	11,550	13,170
Finance expenses	10	76,700	-47,435
Total finance income and expenses		88,250	-34,265
Share of the profit/loss of joint ventures		1,385	1,387
Profit/loss before income tax		**87,196**	**-18,226**
Income taxes	11	0	0
Profit/loss for the financial year		**87,196**	**-18,226**
Profit/loss for the financial year attributable to:			
Equity holders of the company		87,196	-18,226

Consolidated statement of comprehensive income

EUR 1,000	1 Jan–31 Dec 2019	1 Jan–31 Dec 2018
Profit/loss for the financial year	87,196	-18,226
Other comprehensive items		
Items that may be reclassified to profit or loss in subsequent periods:		
Cash flow hedges	-8,028	7,125
Total other comprehensive profit/loss items	-8,028	7,125
Total comprehensive profit/loss for the financial year	**79,168**	**-11,101**
Total comprehensive profit/loss for the financial year attributable to:		
Equity holders of the company	79,168	-11,101

Consolidated balance sheet

EUR 1,000	Note	31 Dec 2019	31 Dec 2018
Assets			
Non-current assets			
Property, plant and equipment	12	5,663,306	5,353,160
Intangible assets	13	5,961	11,333
Loans and other receivables	16	596,417	669,295
Investments in joint ventures	14	7,374	5,989
Investments in shares	17	1,934	1,934
Derivative financial instruments	20	29,254	31,999
Share in the Finnish State Nuclear Waste Management Fund	24	1,040,826	952,020
Total non-current assets		**7,345,072**	**7,025,730**
Current assets			
Inventories	19	269,856	260,594
Trade and other receivables	16	73,262	149,640
Derivative financial instruments	20	15,859	5,240
Cash and cash equivalents	18	237,832	221,166
Total current assets		**596,809**	**636,640**
Total assets		**7,941,881**	**7,662,370**
Equity and liabilities			
Capital and reserves attributable to equity holders of the company			
Share capital	21	600,365	600,365
Share premium reserve and statutory reserve	21	242,383	242,383
Reserve for invested non-restricted equity	21	3	3
Fair value and other reserves	21	-5,378	2,650
Subordinated shareholder loans (hybrid equity)	21	679,300	679,300
Retained earnings	21	302,724	220,556
Total equity		**1,819,397**	**1,745,257**

EUR 1,000	Note	31 Dec 2019	31 Dec 2018
Liabilities			
Non-current liabilities			
Provision related to nuclear waste management	24	1,040,826	952,020
Loan from the Finnish State Nuclear Waste Management Fund	22	591,441	666,242
Bonds	22	2,858,937	2,582,556
Other financial liabilities	22	1,040,301	1,067,941
Derivative financial instruments	20, 22	29,820	30,252
Total non-current liabilities		**5,561,325**	**5,299,011**
Current liabilities			
Current financial liabilities	22	422,769	459,513
Derivative financial instruments	20, 22	18,365	706
Advance payments received	23	17,788	20,398
Trade payables	23	6,655	7,184
Other current liabilities	23	95,582	130,301
Total current liabilities		**561,159**	**618,102**
Total liabilities		**6,122,484**	**5,917,113**
Total equity and liabilities		**7,941,881**	**7,662,370**

Consolidated statement of changes in total equity

EUR 1,000	Share capital	Share premium reserve and statutory reserve	Reserve for invested non-restricted equity	Fair value and other reserves	Subordinated shareholder loans (hybrid equity)	Retained earnings	Attributable to equity holders of the company	Total equity
Equity 1 Jan 2019	**600,365**	**242,383**	**3**	**2,650**	**679,300**	**220,556**	**1,745,257**	**1,745,257**
Profit/loss for the financial year	0	0	0	0	0	87,196	87,196	87,196
Other comprehensive profit/loss items:								
Cash flow hedges	0	0	0	-8,028	0	0	-8,028	-8,028
Subordinated shareholder loans (hybrid equity)	0	0	0	0	0	0	0	0
Interest paid of subordinated shareholder loans (hybrid equity)	0	0	0	0	0	-5,028	-5,028	-5,028
Reduction of share capital	0	0	0	0	0	0	0	0
Equity 31 Dec 2019	**600,365**	**242,383**	**3**	**-5,378**	**679,300**	**302,724**	**1,819,397**	**1,819,397**

EUR 1,000	Share capital	Share premium reserve and statutory reserve	Reserve for invested non-restricted equity	Fair value and other reserves	Subordinated shareholder loans (hybrid equity)	Retained earnings	Attributable to equity holders of the company	Total equity
Equity 1 Jan 2018	**606,193**	**242,383**	**0**	**-4,475**	**579,300**	**243,293**	**1,666,694**	**1,666,694**
Profit/loss for the financial year	0	0	0	0	0	-18,226	-18,226	-18,226
Other comprehensive profit/loss items:								
Cash flow hedges	0	0	0	7,125	0	0	7,125	7,125
Subordinated shareholder loans (hybrid equity)	0	0	0	0	100,000	0	100,000	100,000
Interest paid of subordinated shareholder loans (hybrid equity)	0	0	0	0	0	-4,511	-4,511	-4,511
Reduction of share capital	-5,828	0	3	0	0	0	-5,825	-5,825
Equity 31 Dec 2018	**600,365**	**242,383**	**3**	**2,650**	**679,300**	**220,556**	**1,745,257**	**1,745,257**

Consolidated cash flow statement

EUR 1,000	Note	2019	2018
Operating activities			
Profit/loss for the financial year		87,196	-18,226
Adjustments:			
Finance income and expenses		-88,250	34,265
Depreciation and impairment charges		45,488	55,181
Share of the profit/loss of joint ventures		-1,385	-1,387
Other non-cash flow income and expenses		1,488	-15,161
Sales profit/loss of property, plant and equipment and shares		-16	14
Changes in working capital:			
Increase (-) or decrease (+) in non-interest-bearing receivables		76,952	-6,204
Increase (-) or decrease (+) in inventories		-8,985	-3,503
Increase (+) or decrease (-) in short-term non-interest-bearing liabilities		-25,404	2,284
Interest paid and other finance expenses		-3,437	-3,624
Interest received		3,497	3,878
Cash flow from operating activities		**87,144**	**47,517**
Investing activities			
Acquisition of property, plant and equipment		-395,144	-620,478
OL3 EPR project compensation		122,000	328,000
Proceeds from sale of property, plant and equipment		23	15
Acquisition of intangible assets		-97	-155
Loan receivables granted		-9,098	-10,867
Repayments of loans granted		84,006	240
Cash flow from investing activities		**-198,310**	**-303,245**

EUR 1,000	Note	2019	2018
Financing activities			
Reduction of share capital		0	-5,825
Withdrawals of subordinated shareholder loans (hybrid equity)		0	100,000
Withdrawals of long-term loans		943,192	804,993
Repayment of long-term loans		-817,151	-719,644
Principal elements of lease payments		-2,049	0
Interest paid of subordinated shareholder loans (hybrid equity)		-5,170	-4,285
Increase (-) or decrease (+) in interest-bearing receivables		-2,030	0
Increase (+) or decrease (-) in current financial liabilities		11,039	161,416
Cash flow from financing activities		**127,831**	**336,655**
Change in cash and cash equivalents		**16,665**	**80,927**
Cash and cash equivalents 1 Jan		221,166	140,239
Cash and cash equivalents 31 Dec	18	**237,832**	**221,166**

Notes to the consolidated financial statements

1 General information on the Group

TEOLLISUUDEN VOIMA OYJ together with its subsidiary forms the TVO Group. The ultimate parent of the Group is Teollisuuden Voima Oyj, domiciled in Helsinki.

The Company owns and operates two nuclear power plant units (OL1 and OL2) and has a third unit (OL3) under construction at Olkiluoto in the municipality of Eurajoki. In addition to the nuclear power plant in Olkiluoto, TVO has a share in the Meri-Pori coal-fired power plant and in a gas turbine plant. Fortum is entitled to use TVO's share of the Meri-Pori capacity as of the beginning of 2019, and TVO will relinquish its share in Meri-Pori in full in the beginning of July 2020.

Copies of the consolidated financial statements are available at the internet address www.tvo.fi.

These consolidated financial statements were authorized for issue by the Board of Directors of TVO in its meeting on 26 February 2020. Under the Finnish Limited Liability Companies Act the Shareholders' meeting may modify or reject the financial statements.

TVO's cost-price principle

TVO is a public limited liability company owned by Finnish industrial and energy companies. Under its Articles of Association, TVO supplies electricity to its shareholders at cost (so-called Mankala principle), which means that it delivers the electricity it has produced or procured to its shareholders in proportion to their shareholdings in each series. Each of the shareholders of each series bears their share of the variable and fixed annual costs as specified in detail in the Articles of Association.

In accordance with TVO's Articles of Association, each shareholder of each series is responsible for the following variable annual costs of the Company allocated to the series in the proportion that it has consumed the electricity generated or transferred by the Company:

1. Acquisition, transport, transportation insurance, storage and handling costs of fuel;
2. Taxes depending on the power production, and
3. Other costs incurred to the company directly depending on the power volume used by the respective shareholder.

In accordance with TVO's Articles of Association, each shareholder of each series, irrespective of whether or not it has used its share of electricity, is responsible for the following fixed annual costs of the Company in proportion with the number of shares of the particular series it holds:

4. Normal operating, maintenance and administrative costs;
5. Other taxes than those depending on the power production;
6. Insurance costs;
7. Installments and interest payments on the loans of the Company falling due annually in accordance with the loan agreements of the Company as well as other expenses resulting from the financing of the Company or the arranging thereof;
8. Depreciations;
9. Costs set out in the Nuclear Energy Act incurred by the Company's nuclear waste management (concerning the nuclear power plants), and
10. Other costs independent of power production related to the Company's normal business and included in the budget or approved by the Board of Directors.

In accordance with TVO's Articles of Association, each shareholder's share of the liability for the annual costs will always be limited to the amount corresponding to the proportion of its shareholding to all shares belonging to the same series, and another shareholder's failure will not increase the shareholder's liability based on shareholding. Only the Company will have the sole right to call upon the responsibility of the shareholders defined in the Articles of Association. The shareholders shall not be liable for costs other than the costs of the Company mentioned above, unless otherwise agreed.

A prerequisite to the shareholder's right to receive electricity is that it has paid its share of costs on time. If a shareholder neglects to observe its payment obligation, the Company will have the right to immediately cut off the distribution of electricity to the shareholder and to sell the shareholder's portion of electricity to a party submitting the best offer, primarily to another shareholder of the Company.

The cost-price principle is described in detail in the Articles of Association.

2 Accounting policies

Basis of preparation

THESE consolidated financial statements of TVO Group have been prepared in accordance with International Financial Reporting Standards (IFRS). These financial statements have been prepared in accordance with the IAS and IFRS standards and SIC and IFRIC interpretations effective on 31 December 2019. In the Finnish Accounting Act and regulations issued by virtue of it, "IFRS" refers to the standards and interpretations which have been endorsed by the EU in accordance with the procedure defined in the EU Regulation (EY) No. 1606/2002.

The consolidated financial statements have been prepared under the historical cost convention, except for fund units and investments in shares and derivative financial instruments, which are recognized at fair value.

The consolidated financial statements are presented in euros, which is the functional and presentation currency of the Group's parent company.

The consolidated financial statements have been prepared according to the same accounting policies as in 2018. The Group has adopted the following amendments to existing standards on 1 January 2019:

- IFRS 16 Leases

The Group has adopted IFRS 16 Leases retrospectively from 1 January 2019, but has not restated comparatives for the 2018 reporting period, as permitted under the specific transition provisions in the standard. The reclassifications and the adjustments arising from the new leasing rules are recognized in the opening balance sheet on 1 January 2019. The new accounting policies are disclosed in paragraph Leases and in note 12 Property, Plant and Equipment.

On adoption of IFRS 16, the Group recognized lease liabilities in relation to leases which had previously been classified as 'operating leases' under the principles of IAS 17 Leases. These liabilities were measured at the present value of the remaining lease payments, discounted using the average interest rate on the Group's loans and derivatives on 1 January 2019, which was 1,81 %. In applying IFRS 16 for the first time, the Group has used practical expedients permitted by the standard. Because of the adoption on 1 January 2019, recognition of the right-of-use assets EUR 762 thousand has been made to property, plant and equipment and recognition of lease liability EUR 762 thousand has been made to non-current liabilities and current liabilities.

The Group did not need to make any adjustments to the accounting for assets held as lessor under operating leases as a result of the adoption of IFRS 16.

- IFRIC 23 Uncertainty over Income Tax Treatments
- IFRS 9 (amendment) Financial Instruments
- IAS 28 (amendment) Investments in Associates and Joint Ventures
- Annual Improvements 2015–2017: IFRS 3 Business Combinations, IFRS 11 Joint Arrangements, IAS 12 Income Taxes and IAS 23 Borrowing costs
- IAS 19 (amendment) Employee Benefits

The following new standards, interpretations and amendments to existing standards and interpretations issued already will be adopted by the Group in 2020:

- IAS 1 (amendment) Presentation of Financial Statements and IAS 8 (amendment) Accounting Policies, Changes in Accounting Estimates and Errors
- IFRS 3 (amendment) Business Combinations [1)]
- IFRS 9 (amendment) Financial Instruments, IFRS 7 (amendment) Financial Instruments: Disclosures and IAS 39 (amendment) Financial Instruments: Recognition and Measurement

The following new standards and amendments to existing standards issued already will be adopted by the Group in 2021 or later:

- IFRS 17 Insurance Contracts [2)]

Management is assessing the impact of these changes on the financial statements of the Group.

[1)] The standard, interpretation or amendment to published standard or interpretation is still subject to endorsement by the European Union. Effective date will be 1 January 2020.
[2)] The standard, interpretation or amendment to published standard or interpretation is still subject to endorsement by the European Union. Effective date will be 1 January 2021.

Companies included in the consolidated financial statement

SUBSIDIARIES
The consolidated financial statements include Teollisuuden Voima Oyj (TVO) and its subsidiary TVO Nuclear Services Oy. Subsidiaries are companies in which the Group has control at the end of the financial period. Control exists if the Group holds more than a half of the voting rights or otherwise has control. Subsidiaries acquired are consolidated from the date on which control is transferred to the Group, and subsidiaries sold are no longer consolidated from the date that control ceases.

The purchase method of accounting is used to consolidate subsidiaries into the Group. The purchase price is determined as the aggregate of the acquisition date fair values of the assets given as consideration and liabilities incurred or assumed. Costs directly attributable to the acquisition are recognized in profit or loss.

In the consolidation, intercompany share ownership, intercompany transactions, receivables, liabilities, unrealized gains and internal distributions of profits are eliminated. Unrealized losses are not eliminated, if the losses are due to impairment of the asset being transferred. To ensure consistency, subsidiaries' accounting policies have, in all material respects, been changed to conform to the accounting policies adopted by the Group.

JOINT VENTURES

The Group applies IFRS 11 to all joint arrangements. Under IFRS 11 investments in joint arrangements are classified as either joint operations or joint ventures depending on the contractual rights and obligations of each investor.

TVO's joint venture is Posiva Oy, whose main activity (A series) is the final disposal of nuclear fuel of nuclear power plants. Both ventures are liable for its main activities in proportion to their own usage. Posiva Solutions Oy is a wholly-owned subsidiary of Posiva Oy (B series). Posiva Solutions Oy focuses on the sales of the know-how Posiva has accumulated from its design, research and development activities in the final disposal of spent nuclear fuel, as well as on associated consulting services. Posiva Group is accounted for by the equity method of accounting.

Under the equity method of accounting, interests in joint ventures are initially recognized at cost and adjusted thereafter to recognize the Group's share of the post-acquisition profits or losses and movements in other comprehensive income. When the Group's share of losses in a joint venture equals or exceeds its interests in the joint ventures, the Group does not recognize further losses, unless it has incurred obligations or made payments on behalf of the joint ventures.

Unrealized gains on transactions between the Group and its joint venture are eliminated to the extent of the Group's interest in the joint ventures. Unrealized losses are also eliminated unless the transaction provides evidence of an impairment of the asset transferred. Account policies of the joint ventures have been changed where necessary to ensure consistency with the policies adopted by the Group.

Segment reporting

The Group has two reportable segments; nuclear power and coal power. The Board of Directors is the chief operation decision maker.

Revenue recognition principles

TVO operates on a cost-price principle. Revenue is recognized based on the consideration received when electricity is delivered or services are rendered. Revenue is presented net of indirect sales taxes. Revenue is recognized as follows:

SALES OF ELECTRICITY AND OTHER REVENUE

Revenue on sales of electricity is divided into variable and fixed charge. Revenue on sales of electricity concerning variable charge is recognized based on delivery. The recognized income for shareholders is based on the quantities delivered. The variable charge is invoiced and recognized in turnover monthly. These variable costs are paid retrospectively on the 24th day of the next month. The fixed costs are invoiced one month in advance and recognized advance payments received. The fixed charge is entered as income in the right month. According to TVO's Articles of Association the fixed costs must be paid monthly in advance and no later than the 24th day of the preceding month.

The revenue from services is recognized on an accrual basis on the accounting period when the services are rendered to the customer and when the control of the service transfers to a customer.

Revenue on long-term consulting services projects that spread over several accounting periods is recognized based on the proportion of costs incurred from work performed up to the balance sheet date and the estimated total expenses of the project. If it is probable that total contract costs will exceed total contract revenue, the expected loss is recognized as an expense immediately.

OTHER INCOME

Revenue from activities outside the ordinary course of business is reported as other income. This includes joint ventures' revenue from services, rental income and non-recurring items, such as gains from sales of property, plant and equipment. Rental income is recognized on a straight-line basis over the rental period and gains from sales of property, plant and equipment when the significant risks and rewards of ownership, interests and control have been transferred to the buyer.

Government grants

Grants are recognized at their fair value, when the Group meets all the conditions attached to them and where there is a reasonable assurance that the grant will be received. Government grants relating to costs are deferred on the balance sheet and recognized in the income statement over the period in which their relevant costs are recorded. Government grants relating to the purchase of property, plant and equipment are deducted from the acquisition cost of the asset.

Research and development costs

Research and development costs (except R&D costs related to nuclear waste management) of the Group are recognized as an expense as incurred and included in other expenses in the income statement. Development costs are capitalized if it is assured that they will generate future income, in which case they are capitalized as intangible assets and amortized over the period of the income streams. Currently the Group does not have any development costs that would qualify for capitalization.

Research costs that relate to nuclear waste management are discussed in the paragraph Assets and provisions related to nuclear waste management obligations.

Property, plant and equipment

Property, plant and equipment of the Group are stated on the consolidated balance sheet at historical cost less grants received, accumulated depreciation and impairment charges, if any. Historical cost includes expenditure that is directly attributable to the acquisition of an item.

In the historical costs of power plant projects and other significant investments (completion time more than a year) the financing costs incurred during the construction period will be included.

The historical costs of nuclear power plants include furthermore the estimated costs of dismantling and removing an item and restoring the site on which it is located (more information is included in paragraph Assets and provisions related to nuclear waste management obligations).

Land and water areas are not depreciated.

Other property, plant and equipment are depreciated using the straight-line method over their estimated useful lives.

Straight-line depreciation is based on the following estimated useful lives:

OL1 and OL2 nuclear power plant units:

Basic investment	61 years
Investments made according to the modernization program	19–35 years
Automation investments associated with the modernization	15 years
Additional investments	10 years
Buildings and structures	10–40 years
TVO's share in the Olkiluoto gas turbine power plant	30 years.

The assets' residual values and useful lives are reviewed, and adjusted if appropriate to reflect the changes in expectations of economic benefits.

Costs of renewal of an item or a part of an item of property, plant and equipment are capitalized if the part is accounted for as a separate item. Otherwise, the subsequent expenditure is included in the carrying amount only when it is probable that future economic benefits associated with the expenditure will flow to the Group.

Annual repair and maintenance costs are recognized in profit or loss, when they occur. Investments connected with the modernization and maintenance of the power plant units are capitalized.

OL3 EPR is the nuclear power plant unit under construction. All the realized costs on the OL3 EPR project that meet recognition criteria are shown as incomplete plant investment. See note 12 Property, plant and Equipment.

Intangible assets

Intangible assets are shown at historical cost less grants received, accumulated amortization and impairment losses if applicable. Historical cost includes costs directly attributable to the acquisition of the particular asset.

Other long-term expenditure included in intangible assets are amortized on a straight-line basis over their estimated useful lives. These include computer software and certain payments made for the use of assets.

The amortization periods of the intangible assets are as follows:

Computer software	10 years
Other intangible assets	10 years.

The amortization period of an intangible asset is changed where necessary if the estimated useful life changes from that previously estimated.

Furthermore, intangible assets include carbon dioxide (CO_2) emission rights. Emission rights are recognized at historical cost, and are presented under emission rights. The current liability for returning emission rights is recognized at the carrying value of possessed emission rights. If there is a shortfall, a current liability is recognized to cover the acquisition of the missing emission rights. This current liability is valued at the current market value of the emission rights at the balance sheet date. The cost of the emission rights is recognized in the income statement under costs of materials and services. The gains from the sales of emission rights are refunded to the equity holders of the company.

Impairment of property, plant and equipment and intangible assets

The Group assesses at each balance sheet date whether there are indications that the carrying amount of an asset may not be recoverable. If such indications exist, the recoverable amount of the asset in question will be measured. For the purposes of assessing impairment, assets are examined at the level of cash-generating units, that is, at the lowest level that is mainly independent of other units and for which there are separately identifiable cash flows and largely independent from those of corresponding units.

The recoverable amount is the higher of an asset's fair value less costs to sell or value in use. The value in use is determined by reference to discounted future cash flows expected to be generated by the asset. The discount rate used is pre-tax and reflects the time value of money and asset specific risks.

Impairment loss is recognized when the carrying amount of the asset is greater than its recoverable amount. Impairment loss is charged directly to the income statement. If a cash-generating unit is subject to an impairment loss, it is allocated first to decrease the goodwill and subsequently, to decrease the other assets of the unit. At recognition of the impairment loss, the useful life of the reamortized assets is reassessed. Impairment loss of other assets than goodwill is reversed in the case that a change has occurred in the estimates used in measuring the recoverable amount of the asset. The increased carrying amount must not, however, exceed the carrying amount that would have been determined had no impairment loss been recognized in prior years.

Inventories

Inventories are measured at acquisition cost. The acquisition cost comprises raw materials, direct labor and other direct costs. The carrying amount of inventories is not reduced to a value that is less than its acquisition cost, as TVO operates at cost price, so the net realizable value of inventories always covers their acquisition cost. The cost of coal is determined by using the FIFO (first in, first out) method and the cost of supplies is determined by using the rolling weighted average cost formula. The use of nuclear fuel is recognized according to calculated consumption.

Leases

Leases are contracts that convey the right to control the use of an identified asset for a period of time in exchange for consideration. Leases are recognized as right-of-use assets and lease liability.

Right-of-use assets are recognized on the commencement date and measured at acquisition cost, which includes the amount of the initial measurement of lease liability, any lease payments made before the commencement date less any lease incentives received and any initial direct costs. Lease liabilities are regonised on the commencement date and are measured at present value of remaining payments that will be paid during the term of lease. The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be readily determined, the average interest rate on Group's loans and derivatives is used. Right-of-use assets are generally depreciated according to IAS 16 Property, Plant and Equipment.

Lease payments are apportioned during the lease term between the finance charge and the reduction of the outstanding liability to produce a constant periodic rate of interest on the remaining balance of the liability.

Lease payments associated with short-term leases and all leases of low-value assets are recognized on a straight-line basis as an expense in profit or loss. Short-term leases are leases with a lease term of 12 months or less. Low-value assets comprise IT equipment. Lease payments received are recognized as income on a straight-line basis over the lease term and presented in the income statement under other income.

Financial assets

In the Group, financial assets are divided into the following categories in accordance with the IFRS 9 standard: assets measured at fair value through profit or loss, at fair value through other comprehensive income items and at amortized cost. According to the standard, the classification is based on the business goal of the financial assets and contractual cash flows, and they are classified during their original acquisition.

Transaction expenses are included in the original book value of the financial liabilities, except in the case of items measured at fair value through profit or loss. All purchases and sales of financial assets are recognized at fair value on their trade date.

Financial assets are derecognized once the Group has lost its contractual right to the cash flows or transferred a significant portion of the risks and revenue out of the Group.

RECOGNIZED AT FAIR VALUE THROUGH PROFIT OR LOSS

Derivative financial instruments that do not meet the criteria for hedge accounting of the IFRS 9 standard are recognized at fair value through profit or loss. Profit and loss resulting from changes in fair value are recognized in the income statement in the financial period during which they have arisen. However, if expenses or income resulting from derivative financial instruments are caused by the construction of the OL3 EPR power plant, they are activated as part of the acquisition cost of the asset.

Fund holdings are recognized at fair value through profit or loss as either current or non-current items. In the Group, fund holdings are included in current receivables, except in the case of items whose maturity exceeds 12 months from the reporting date. Fund investments measured at fair value through profit or loss are classified as fund holdings.

AMORTIZED COST

Amortized cost includes non-current loan and other receivables as well as current trade and other receivables. If an item is due in over 12 months, it is recognized as a non-current asset. After initial recognition, all loan and other receivables are measured at amortized cost using the effective interest method. Trade receivables are recognized on the balance sheet at their original nominal value, which corresponds to their fair value.

FAIR VALUE THROUGH OTHER COMPREHENSIVE INCOME ITEMS

Share investments are included in the "Non-current asset investments in shares" class and recognized at fair value through other comprehensive income items. Changes in fair value are entered in other comprehensive income items and presented in the equity fair value reserve.

CASH AND CASH EQUIVALENTS

Cash and cash equivalents comprise cash balances, call deposits and other short-term, liquid investments. Items classified as cash and cash equivalents have a maturity of no more than three months from the date of acquisition.

IMPAIRMENT OF FINANCIAL ASSETS

According to impairment model, the impairment of financial assets must be determined using a model based on expected credit losses. From the Group's perspective, the impairment model applies to trade receivables and the earlier recognition of their credit losses. The Group's credit position has not changed between the standards.

According to the IFRS 9 standard, the Group applies a simplified provision matrix to recognising the credit risks in trade receivables, on the basis of which a deductible item is recognized for all trade receivables based on the expected credit losses over the entire period of validity.

The Group's annual credit losses have been very minor, and the expected credit losses according to the new model are not expected to have a significant impact. The impairment model has no impact on financial assets measured at fair value, since expected credit losses are already taken into account in the fair value in accordance with the IFRS 9 standard. As regards financial instruments measured at amortized cost, the Group performs active monitoring and recognizes impairment in profit or loss in accordance with the criteria.

On each closing date, the Group estimates whether objective evidence exists of the impairment of an individual financial asset or a group thereof. If the fair value of the financial assets has fallen substantially below their acquisition cost on the closing date, this is considered evidence of impairment of the financial assets. The impairment loss of equity convertible investments classified as items recognized at fair value through other comprehensive income items is not reversed by means of the income statement.

Evidence of impairment may include, for example, the counterparty's substantial financial difficulties, failure to pay interest or instalments, probability of bankruptcy or other financial reorganization, or observable information indicating determinable reduction of the estimated deferred cash flows, such as changes in the delay of payments and the counterparty's deteriorated financial situation correlating with the failure to pay.

Financial liabilities

The Group's financial liabilities are divided into the following categories in accordance with the IFRS 9 standard: assets measured at fair value through profit or loss, at fair value through other comprehensive income items and at amortized cost.

Financial liabilities are recognized at fair value including transaction expenses. After initial recognition, all financial liabilities are measured at amortized cost using the effective interest method. Financial liabilities are included in non-current and current liabilities and may be either interest-bearing or non-interest-bearing. An item is recognized in current liabilities if it is due within 12 months of the closing date.

Derivative financial instruments and hedge accounting

The Group uses derivative financial instruments to hedge against the currency risk of fuel acquisitions and currency and interest rate risk of loans. Derivative financial instruments are recognized on the balance sheet at fair value on the day on which the Group becomes a party to the derivative financial instruments contract and are thereafter always measured at fair value on the closing date.

Items covered by hedge accounting in accordance with the IFRS 9 standard include instruments used for hedging against the currency risk of the Group's uranium supply contracts (forward exchange contracts, currency swaps) and some of the interest rate swaps used for hedging against the fluctuation of interest cash flows in the Group's loan agreements.

The Group shall document, both at the beginning of and after the hedging, its estimate of whether the derivative financial instruments used for hedging transactions are efficient. Derivative financial instruments included in hedge accounting are divided into non-current and current assets and liabilities based on the maturity of the hedged instrument. The Group applies both cash flow and fair value hedge accounting.

With the adoption of the IFRS 9 standard, the assessment of hedge effectiveness is based on future orientation. The ineffectiveness of the Group's hedging relationships is expected to continue being very minor.

The IFRS 9 standard defines three hedge effectiveness requirements for the application of hedge accounting. The first requirement demands a financial relationship between the hedged item and hedging instrument. It must be expectable that the changes in the value of the hedging instrument and hedged item are opposite due to the instrument or risk used as the shared basis. Secondly, the standard requires that changes in value due to the financial relationship are not dominated by the impact of credit risk. Thirdly, the hedging rate of the hedging relationship must equal the hedging rate resulting from the amount of the hedged item that the organization actually hedges and the amount of the hedging instrument that the organization actually uses for hedging that amount of the hedged item. The IFRS 9 standard requires the same hedging rate that is actually used in risk management.

CASH FLOW HEDGING

The effective portion of the changes in fair value of the derivative instruments that have been specified as cash flow hedges and meet the criteria for cash flow hedging are entered in other comprehensive income items and presented in the equity fair value reserve. Profit or loss relating to the ineffective portion is recognized in the income statement, except if they are caused by the construction of the OL3 EPR power plant, in which case the finance charges are capitalized as part of the acquisition cost. Changes in fair value accumulated in equity are recognized in the balance sheet for the financial period in which the hedged item affects the profit or loss. The “At fair value through other comprehensive income items” category also includes derivative financial instruments in cash flow hedge accounting.

In hedging against the currency risk of fuel acquisitions, the hedging instrument’s profits and losses are moved from equity to amend the cost of the inventory item in question. In the hedging of fuel acquisitions, profit or loss recognized in inventories is recognized according to the inventory recognition principles to adjust fuel acquisitions in “Materials and services”.

When the interest rate risk hedging of loans no longer meets the requirements for applying hedge accounting, or when a hedging instrument acquired for hedging falls due or is sold, the profit or loss accumulated in equity at the time in question is recognized in profit or loss during the validity of the hedged item in question. When the forecast transaction is no longer expected to take place, the profit or loss accumulated in equity is recognized in the income statement.

When the currency risk hedging of fuel acquisitions no longer meets the requirements for applying hedge accounting, or when a hedging instrument acquired for hedging falls due or is sold, the profit or loss accumulated in equity at the time in question is recognized in inventories at the same time as the purchase of inventories. When the forecast transaction is no longer expected to take place, the profit or loss accumulated in equity is recognized in the income statement.

FAIR VALUE HEDGING

The Group applies fair value hedge accounting in the interest rate risk hedging of publicly quoted fixed-rate liabilities. Changes in the fair value of derivative instruments that meet the criteria for fair value hedge accounting, as well as the change in fair value caused by the interest rate risk of the related hedged items, are recognized in profit or loss in the financial items in the income statement. The balance sheet values of loans and fair values of hedging instruments directed at loans are included in interest-bearing liabilities and assets. If the criteria for hedge accounting are no longer met, the adjustments made to the hedged loan are released into the income statement using the effective interest method for the remaining maturity of the loan.

DERIVATIVES OUTSIDE HEDGE ACCOUNTING

Changes in the fair value of interest rate options, interest rate swaps and forward exchange contracts left outside hedge accounting are presented in financial income and expenses to the extent that they are not activated as part of the acquisition cost caused by the construction of the OL3 EPR power plant.

Borrowing costs

Borrowing costs are recognized in profit or loss in the period when they have incurred, except when they relate to the construction of a power plant or any other significant investment, of which completion time exceeds one year. In that case, borrowing costs are capitalized as part of the cost of the asset.

Foreign currency items

Transactions and financial items denominated in a foreign currency are recognized at the rates on the day when they occur. Receivables and liabilities denominated in a foreign currency are measured in the financial statements at the ECB’s official exchange rate on the closing date. Exchange gains and losses from operating activities are included in the corresponding items above operating profit or loss. Exchange differences arising from financial items are recognized in finance income and expenses.

Equity

SHARE CAPITAL

TVO has in its possession three series of shares, A, B and C. The A series entitles the shareholder to the electricity generated by the OL1 and OL2 nuclear power plant units. The B series entitles the shareholder to the electricity that will be generated by the OL3 unit. The C series entitles the shareholder to the electricity generated by the TVO share in the Meri-Pori coal-fired power plant.

Payments received from shares in connection with setting up the TVO and in the form of increases in share capital are recognized under share capital, statutory reserve and share premium reserve. When share capital was reduced, some assets from share capital was returned to the shareholders. At the same time reserve for invested non-restricted equity was founded.

SUBORDINATED SHAREHOLDER LOANS (HYBRID EQUITY)

Subordinated shareholder loans (hybrid equity) are treated as equity. Subordinated shareholder loans (hybrid equity) are initially recognized at fair value including related transaction costs. There is no maturity date for the subordinated shareholder loans (hybrid equity), but the borrower is entitled to repay the loan in one or several installments. The Board of Directors of the borrower has the right to decide not to pay interest during any current interest period. Unpaid interest does not accumulate to the following interest periods.

The interest of the subordinated shareholder loans (hybrid equity) are recognized in liabilities when the obligation to pay interest is incurred. Interest expenses are recognized in the retained earnings and are not recognized in profit or loss.

Earnings per share

The Group does not report earnings per share, as the parent company is operating at cost price. The shares of TVO are not traded on a public market.

Provisions

The Group recognizes a provision for environmental restorations, asset retirement obligations, as well as legal and other claims, when the Group has a legal or constructive obligation and it is likely that an outflow of resources will be required to settle the obligation and the amount of the obligation can be reliably estimated. The provision is measured at the present value of the expenditure expected to be required to settle the obligation. The discount rate used in the measurement of provisions is the estimated average risk premium of companies with TVO's rating in relation to risk-free interest rate plus the ECP's inflation target. The increase in the provision due to the passage of time is recognized as interest expense.

The most significant provision is that for the nuclear waste management obligation under the Nuclear Energy Act. The provision covers all future expenditure arising from nuclear waste management, including the decommissioning of nuclear power plants, the disposal of spent fuel and a risk marginal.

ASSETS AND PROVISIONS RELATED TO THE NUCLEAR WASTE MANAGEMENT OBLIGATION

The parent company's nuclear waste management obligation which is based on the Nuclear Energy Act is covered by payments made to the Finnish State Nuclear Waste Management Fund. The obligation covers all the future expenditures for nuclear waste management, including the decommissioning of nuclear power plants, the disposal of spent fuel, and a risk marginal. The amount of payments is determined by assuming that the decommissioning would start at the beginning of the year following the assessment year. The research relating to the disposal, as well as the actual disposal of TVO's spent fuel, are carried out by Posiva Oy, which charges from TVO the costs arising from these activities, including the acquisition cost of property, plant and equipment.

In the consolidated financial statements, TVO's share of the Finnish State Nuclear Waste Management Fund is shown as non-current assets. It is accounted for in accordance with IFRIC 5 Rights to Interests Arising from Decommissioning, Restoration and Environmental Rehabilitation Funds. It is stated that the fund assets are measured at the lower value or the value of the related liabilities since TVO does not have control or joint control over the Finnish State Nuclear Waste Management Fund.

The nuclear waste management obligation is shown as a provision under non-current liabilities. The fair value of the nuclear waste management provision has been determined by discounting the future cash flows which are based on plans about future activity and the estimated expenditure relating to it, taking into account actions already taken.

The present initial value of the provision for the decommissioning of a nuclear power plant (at the time of commissioning the nuclear power plant) has been capitalized as property, plant and equipment and will be adjusted later for possible changes in the plan. The amount recognized relating to decommissioning will be depreciated over the estimated operating time of the nuclear power plant.

The provision for spent fuel covers the future disposal costs of fuel used by the end of each accounting period. The costs for the disposal are expensed during the operating time of the plant, based on fuel usage. The impact of any changes to the plan will be recognized immediately in the income statement based on fuel used by the end of each accounting period.

The timing factor is taken into account by recognizing the interest expense related to discounting the nuclear waste management provision. The interest accruing on TVO's share in the Finnish State Nuclear Waste Management Fund is presented as finance income.

TVO's share in the Finnish State Nuclear Waste Management Fund is higher than the corresponding asset recognized in the balance sheet. The nuclear waste management obligation is covered by TVO's share in the Fund, as required by the Nuclear Energy Act. The obligation for nuclear waste management is not discounted. The amount of the annual payment to the Finnish State Nuclear Waste Management Fund is based on the change on the nuclear waste management obligation and funding obligation target, the share of the profit or loss of the Fund, and the changes resulting from actions taken.

Taxes

The Group does not recognize deferred taxes, because TVO operates at cost price. According to this principle, TVO will not pay taxes on its operations, and therefore there is no taxable income. The tax recognized by the Group consists of tax relating to non-deductible expenses. It also includes any taxes for previous financial years.

Employee benefits

The pension benefits for Group personnel have been arranged with external pension insurance companies. The insurance policies relating to earnings-based pensions, as well as some voluntary pension insurance policies, have been accounted for as defined contribution plans.

Payments made to defined contribution plans as to pensions are recognized on an accrual basis in the income statement.

Critical accounting estimates and judgements

The preparation of financial statements requires estimates and assumptions concerning the future. Estimates and assumptions have an effect on the reported amounts of assets and liabilities, and expenses and income during the accounting period. The actual results may differ from these estimates.

THE PROVISION FOR FUTURE OBLIGATIONS FOR THE DECOMMISSIONING OF THE NUCLEAR POWER PLANT AND FOR THE DISPOSAL OF SPENT FUEL

Estimates and assumptions have been used when estimating the assets, liabilities, expenses and income related to the future decommissioning of the nuclear power plant and the disposal of spent fuel. These are based on long-term cash-flow forecasts of estimated future costs.

The main assumptions relate to technical plans, time factor, cost estimates and the discount rate. The technical plans are approved by State authorities. Any changes in the assumed discount rate would change the provision. If the discount rate used were lowered, the provision would increase.

Any future increase in the provision would be offset by the recognition of an equal increase in TVO's share in the assets of the Finnish State Nuclear Waste Management Fund. According to IFRS, the carrying amount of the assets is limited to the value of the provision, as TVO does not have control in the Finnish State Nuclear Waste Management Fund (see note 24 Assets and provisions related to nuclear waste management obligation).

POWER PLANT CONSTRUCTION IN PROGRESS – OL3 EPR

OL3 EPR is a power plant unit under construction that has been ordered under a turnkey principle. According to an announcement of the OL3 turnkey supplier, the delivery will be delayed from the original schedule according to which the power plant unit should have been in production as of 30 April 2009.

The settlement agreement between TVO and the plant supplier consortium companies Areva NP, Areva GmbH and Siemens AG as well as with Areva Group parent company Areva SA, a company wholly owned by the French State, concerning the completion of the OL3 EPR project and related disputes entered into force late March 2018.

The amounts corresponding to the settlement amount have been entered as property, plant and equipment in the Group balance sheet.

All the realized costs on the OL3 EPR project that meet recognition criteria have been booked as acquisition costs of property, plant and equipment on the Group balance sheet. TVO's management have estimated that there is not known any technical or other issues that would prevent the completion of OL3 EPR project or the commencement of the unit as stipulated in the settlement agreement. The recognition criteria of the acquisition costs OL3 EPR project are realized because all the necessary actions will be completed to prepare the asset for its intended use.

IMPAIRMENT TESTING

Impairment testing of non-current assets is performed when there are indications that the carrying amount of an asset may not be recoverable. In testing, future discounted cash flows which can be recovered by use of the asset and its possible sale are used as an indicator.

TVO operates on a cost-price principle. According to the Company documents, the shareholders are obliged to pay all the expenses of the Company in electricity prices including amortization of property, plant and equipment. When assessing by means of recoverable amounts possible impairment of assets and subsequent need for recognition of impairment loss, the recoverable amounts always correspond, with some exceptions, to the carrying amount of the asset and thus, as a rule, no need for recognition of impairment loss arises.

3 Segment reporting

Segment structure in TVO Group

The Group has two reportable segments; nuclear power and coal power.

The electricity of the nuclear power segment is produced at two nuclear power plant units, Olkiluoto 1 and Olkiluoto 2 (OL1 and OL2). A new unit, Olkiluoto 3 (OL3), is under construction at Olkiluoto. The subsidiary of TVO, TVO Nuclear Services Oy (TVONS), of which operation is related to nuclear power, is also included in the nuclear power segment.

The electricity of the coal-fired power segment is produced by TVO's share at the Meri-Pori coal-fired power plant. Fortum is entitled to use TVO's share of the Meri-Pori capacity as of the beginning of 2019, and TVO will relinquish its share in Meri-Pori in full in the beginning of July 2020.

SEGMENT CALCULATION PRINCIPLES

TVO Group discloses in the segment information; turnover, depreciation and impairment charges, finance income and expenses, profit/loss for the year and assets, which the chief operation decision maker follows.

The chief operation decision maker follows reporting according to Finnish Accounting Standards (FAS). Adjustments made under IFRS accounting policies are reported at Group level.

Turnover by segments

EUR 1,000	2019	2018
Nuclear power	238,197	305,842
Coal-fired power	16,011	44,429
Total	**254,208**	**350,271**

Depreciation and impairment charges by segments

EUR 1,000	2019	2018
Nuclear power	38,683	43,498
Coal-fired power	0	9,153
Depreciation and impairment charges (FAS)	38,683	52,651
The impact of the nuclear waste management obligation	6,353	2,461
Other IFRS adjustments	452	69
Total (IFRS)	**45,488**	**55,181**

Finance income and expenses by segments

EUR 1,000	2019	2018
Nuclear power	108	430
Coal-fired power	0	-322
Finance income and expenses (FAS)	108	108
The impact of the nuclear waste management obligation	-87,099	35,263
The impact of financial instruments	-647	-335
Other IFRS adjustments	-612	-771
Total (IFRS)	**-88,250**	**34,265**

Profit/loss for the financial year by segments

EUR 1,000	2019	2018
Nuclear power	5,278	6,155
Coal-fired power	0	-4,240
Profit/loss before appropriations (FAS)	5,278	1,915
The impact of the nuclear waste management obligation	79,258	-22,564
The impact of financial instruments	647	335
Other IFRS adjustments	628	701
Share of the profit/loss of joint ventures	1,385	1,387
Total (IFRS)	**87,196**	**-18,226**

Assets by segments

EUR 1,000	2019	2018
Nuclear power	6,711,401	6,606,883
Coal-fired power	12,505	12,525
Total (FAS)	6,723,906	6,619,408
The impact of the nuclear waste management obligation	1,174,234	1,006,169
The impact of financial instruments	12,904	2,070
The impact of finance leases	51,440	53,166
Other IFRS adjustments	-26,966	-23,421
Share of the profit/loss of joint ventures	6,363	4,978
Total (IFRS)	**7,941,881**	**7,662,370**

Trade receivables by segments

EUR 1,000	2019	2018
Nuclear power	9,731	15,035
Coal-fired power	8,365	3,426
Total (FAS)	18,096	18,461
Total (IFRS)	**18,096**	**18,461**

Group-wide disclosures

Turnover shared to production of electricity and services

EUR 1,000	2019	2018
Production of electricity	250,962	345,702
Services	3,246	4,569
Total	**254,208**	**350,271**

Trade receivables shared to production of electricity and services

EUR 1,000	2019	2018
Production of electricity	17,468	17,457
Services	628	1,004
Total	**18,096**	**18,461**

Information about geographical areas

Teollisuuden Voima Oyj is a company owned by Finnish industrial and power companies. TVO delivers electricity to its shareholders at cost price (so-called Mankala principle), i.e. it delivers the electricity produced to its shareholders in proportion to their shareholdings in each series.

The Group assets are located in Finland except part of the inventories of nuclear fuel acquisition.

4 Work performed for own purpose

EUR 1,000	2019	2018
Personnel expenses related to OL3	18,596	14,941
Total	**18,596**	**14,941**

5 Other income

EUR 1,000	2019	2018
Rental income	1,256	1,074
Profits from sales of property, plant and equipment and shares	16	0
Sales of services	10,820	9,617
Other income	704	1,070
Total	**12,796**	**11,762**

6 Materials and services

EUR 1,000	2019	2018
Nuclear fuel	68,503	68,783
Coal	4,853	6,346
Materials and supplies	4,750	4,736
CO_2 emission rights	5,316	8,660
Nuclear waste management services [1]	-3,111	42,734
Increase (-) or decrease (+) in inventories	-9,332	-4,064
External services	10,987	13,065
Total	**81,966**	**140,260**

[1] See note 24 Assets and provision related to nuclear waste management obligation.

7 Personnel expenses

Employee benefit costs

EUR 1,000	2019	2018
Wages and salaries	56,868	52,618
Pension expenses - defined contribution plans	9,231	9,166
Other compulsory personnel expenses	1,688	1,696
Total	**67,787**	**63,480**

Employee bonus system

The Nomination and Remuneration Committee under the Board of Directors approves TVO's commitment and remuneration systems. All permanent and long-term temporary employees are included in the employee bonus system. Some of the personnel have deposited their bonuses in the Teollisuuden Voima Personnel Fund.

Average number of personnel during financial year

	2019	2018
Office personnel	760	717
Manual workers	183	155
Total	**943**	**872**

Number of personnel on December 31

	2019	2018
Office personnel	752	713
Manual workers	190	165
Total	**942**	**878**

8 Depreciation and impairment charges

EUR 1,000	2019	2018
Intangible assets		
Computer software	332	399
Other intangible assets	62	1,242
Total	**394**	**1,641**
Property, plant and equipment		
Buildings and construction	3,329	5,876
Machinery and equipment	34,135	42,842
Other property, plant and equipment	1,277	2,360
Decommissioning	6,353	2,461
Total	**45,094**	**53,539**
Total	**45,488**	**55,181**

9 Other expenses

EUR 1,000	2019	2018
Maintenance services	22,493	29,760
Regional maintenance and service	8,479	8,744
Research services	3,597	3,927
Other external services	24,378	28,356
Real estate tax	6,198	6,135
Rents	783	946
ICT expenses	5,450	4,090
Personnel-related expenses	4,389	4,869
Corporate communication expenses	848	859
Other expenses	16,183	15,716
Total	**92,798**	**103,401**

Auditors’ fees and not audit-related services PricewaterhouseCoopers Oy

EUR 1,000	2019	2018
Audit fees	145	115
Other services	64	87
Total	**209**	**202**

10 Finance income and expenses

Items included in the income statement

EUR 1,000	2019	2018
Interest income from loans and other receivables		
Nuclear waste management loan receivables from equity holders of the company	2,987	3,364
Other	133	106
Hedge accounted derivatives		
Ineffective portion of the change in fair value in cash flow hedge relationship	0	0
Ineffective portion of the change in fair value in fair value hedge relationship	0	2
Non-hedge accounted derivatives		
Change in fair value	702	485
Interest income from assets related to nuclear waste management	7,728	9,213
Finance income, total	**11,550**	**13,170**
Interest expenses and other finance expenses		
To the Finnish State Nuclear Waste Management Fund	2,987	3,364
To others	-377	-558
Hedge accounted derivatives [1)]		
Ineffective portion of the change in fair value in cash flow hedge relationship	0	0
Ineffective portion of the change in fair value in fair value hedge relationship	1	0
Non-hedge accounted derivatives		
Change in fair value	54	152
Realized derivative expenses, net	7	1
Interest expenses of provision related to nuclear waste management	-79,372	44,476
Finance expenses, total	**-76,700**	**47,435**
Total	**88,250**	**-34,265**

[1)] In hedge accounting the change in fair value adjustment of the loan was EUR -735 thousand and the change of the fair value in hedging instruments was EUR 744 thousand. The ineffective portion is recognized EUR 1 thousand in profit or loss and the rest is capitalized in the balance sheet.

Other comprehensive items

Other comprehensive items related to derivative financial instruments:

EUR 1,000	2019	2018
Cash flow hedges		
Changes in the fair value of which the following items have transferred	-10,163	-4,527
Transfers to the consolidated income statement	0	-31
Transfers to inventories	5,289	1,148
Transfers to the nuclear power plant under construction	-7,424	-12,769
Transferred items, total	**-2,135**	**-11,652**
Cash flow hedges, total	**-8,028**	**7,125**
Total other comprehensive items	**-8,028**	**7,125**

11 Income tax expense

EUR 1,000	2019	2018
Taxes based on the taxable income of the financial year	0	0
Total	**0**	**0**

TVO operates at cost price (so-called Mankala principle, see note 1 General information on the Group), so TVO does not pay income tax during its operations. Taxes for the financial year consists of non-deductible expenses in taxation.

12 Property, plant and equipment

2019 EUR 1,000	Land and water areas	Buildings and construction	Machinery and equipment	Other property, plant and equipment	Construction in progress and advance payments	Decommissioning	Total
Acquisition cost 1 Jan	12,137	267,142	1,375,296	54,004	4,820,551	132,531	6,661,661
Recognized on adoption of IFRS 16	0	310	452	0	0	0	762
Increase	0	1,148	24,926	42	252,486	85,610	364,212
Decrease	-7	-49	-43,985	0	-9,727	0	-53,768
Transfer between categories	0	1,710	15,354	0	-17,064	0	0
Acquisition cost 31 Dec	12,130	270,261	1,372,043	54,046	5,046,246	218,141	6,972,867
Accumulated depreciation and impairment charges according to plan 1 Jan	0	221,461	962,254	46,406	0	78,381	1,308,501
Accumulated depreciation from deduction	0	-49	-43,985	0	0	0	-44,034
Depreciation for the period	0	3,329	34,135	1,278	0	6,352	45,094
Accumulated depreciation and impairment charges according to plan 31 Dec	0	224,741	952,404	47,684	0	84,733	1,309,561
Book value 31 Dec 2019	**12,130**	**45,521**	**419,640**	**6,362**	**5,046,246**	**133,407**	**5,663,306**
Book value 1 Jan 2019	12,137	45,992	413,495	7,598	4,820,551	54,149	5,353,922

2018 EUR 1,000	Land and water areas	Buildings and construction	Machinery and equipment	Other property, plant and equipment	Construction in progress and advance payments	Decommissioning	Total
Acquisition cost 1 Jan	12,137	294,217	1,443,468	55,485	4,730,504	152,633	6,688,444
Increase	0	1,373	22,948	99	147,754	0	172,174
Decrease	0	-28,889	-140,894	-1,862	-7,208	-20,102	-198,956
Transfer between categories	0	442	49,774	282	-50,499	0	0
Acquisition cost 31 Dec	12,137	267,142	1,375,296	54,004	4,820,551	132,531	6,661,661
Accumulated depreciation and impairment charges according to plan 1 Jan	0	244,474	1,060,276	45,908	0	75,920	1,426,578
Accumulated depreciation from deduction	0	-28,889	-140,865	-1,862	0	0	-171,616
Depreciation for the period	0	5,876	42,842	2,360	0	2,461	53,540
Accumulated depreciation and impairment charges according to plan 31 Dec	0	221,461	962,254	46,406	0	78,381	1,308,501
Book value 31 Dec 2018	**12,137**	**45,682**	**413,043**	**7,598**	**4,820,551**	**54,149**	**5,353,160**
Book value 1 Jan 2018	12,137	49,743	383,192	9,577	4,730,504	76,713	5,261,866

The costs for the new plant unit (OL3) under construction constituted EUR 5.0 billion of the advance payments in 2019 (EUR 4.8 billion in 2018).

Leases

AMOUNTS RECOGNIZED IN THE BALANCE SHEET

The balance sheet shows the following amounts relating to leases:

Right-of-use assets

EUR 1,000	Construction in progress	Buildings and construction	Machinery and equipment
Book value 1 Jan 2019	72,723	310	452
Increase	18	275	140
Depreciation for the period	0	-129	-240
Book value 31 Dec 2019	**72,741**	**456**	**352**

EUR 1,000	Construction in progress
Book value 1 Jan 2018	72,715
Increase	8
Book value 31 Dec 2018	**72,723**

Part of the assets acquired through lease agreements is accumulated as costs for construction in progress so there is no accumulated depreciation.

Lease liabilities

EUR 1,000	2019
Current	1,992
Non-current	51,169
Total	**53,161**

AMOUNTS RECOGNIZED IN THE STATEMENT OF PROFIT OR LOSS

The statement of profit or loss shows the following amounts relating to leases:

Depreciation charge of right-of-use assets

EUR 1,000	2019
Buildings and construction	129
Machinery and equipment	240
Total	**369**
Interest expense (included in finance expenses)	146
Expenses relating to short-term leases (included in other expenses)	10
Expenses relating to leases of low-value assets that are not shown above as short-term leases (included in other expenses)	263

The total cash outflow for leases in 2019 was EUR 2,467 thousand.

THE GROUP'S LEASING ACTIVITIES AND HOW THESE ARE ACCOUNTED FOR

The Group leases a spare part of the nuclear power plant, offices, vehicles and equipments. Rental contracts are made for periods of under a year to five years. Part of the contracts are valid until further notice. Holding period of these leases are based on management's judgement. The property of construction in progress can be redeemed at the earliest in 2025.

The lease payments are discounted using the interest rate implicit in the lease, if the rate can readily be determined. If that rate cannot be readily determined, the average interest rate on Group's loans and derivatives is used. For the average interest rate on loans and derivatives on 31 December, see note 27. Payments associated with short-term leases of equipment and vehicles and all leases of low-value assets are recognized on a straight-line basis as an expense in profit or loss. Short-term leases are leases with a lease term of 12 months or less. Low-value assets comprise IT equipment.

CHANGES IN ACCOUNTING POLICIES

Until the financial year 2018, leases of property, plant and equipment were classified as either finance leases or operating leases. From 1 January 2019, leases are recognized as a right-of-use asset and a corresponding liability at the date at which the leased asset is available for use by the Group.

The Group has adopted IFRS 16 Leases retrospectively from 1 January 2019, but has not restated comparatives for the 2018 reporting period, as permitted under the specific transition provisions in the standard. The reclassifications and the adjustments arising from the new leasing rules are therefore recognized in the opening balance sheet on 1 January 2019.

On adoption of IFRS 16, the Group recognized lease liabilities in relation to leases which had previously been classified as 'operating leases' under the principles of IAS 17 Leases. These liabilities were measured at the present value of the remaining lease payments, discounted using average rate on Group's loans and derivatives as of 1 January 2019, which was 1.81%.

In applying IFRS 16 for the first time, the Group has used the following practical expedients permitted by the standard: applying a single discount rate to a portfolio of leases with reasonably similar characteristics and accounting for operating leases with a remaining lease term of less than 12 months as at 1 January 2019 as short-term leases.

13 Intangible assets

2019 EUR 1,000	CO_2 emission rights	Computer software	Other intangible assets	Advance payments	Total
Acquisition cost 1 Jan	8,834	21,288	4,123	7	34,253
Increase	5,142	54	0	43	5,239
Decrease	-10,216	0	0	0	-10,216
Acquisition cost 31 Dec	3,760	21,342	4,123	50	29,276
Accumulated depreciation and impairment charges according to plan 1 Jan	0	19,401	3,519	0	22,920
Depreciation for the period	0	333	62	0	395
Accumulated depreciation and impairment charges according to plan 31 Dec	0	19,734	3,581	0	23,315
Book value 31 Dec 2019	**3,760**	**1,608**	**543**	**50**	**5,961**
Book value 1 Jan 2019	8,834	1,887	605	7	11,333

2018 EUR 1,000	CO_2 emission rights	Computer software	Other intangible assets	Advance payments	Total
Acquisition cost 1 Jan	677	21,320	21,782	0	43,779
Increase	8,835	148	0	7	8,989
Decrease	-677	-180	-17,659	0	-18,516
Acquisition cost 31 Dec	8,834	21,288	4,123	7	34,253
Accumulated depreciation and impairment charges according to plan 1 Jan	0	19,182	19,935	0	39,117
Accumulated depreciation from deduction	0	-180	-17,659	0	-17,838
Depreciation for the period	0	399	1,242	0	1,641
Accumulated depreciation and impairment charges according to plan 31 Dec	0	19,401	3,519	0	22,920
Book value 31 Dec 2018	**8,834**	**1,887**	**605**	**7**	**11,333**
Book value 1 Jan 2018	677	2,138	1,847	0	4,662

Capitalized borrowing costs included in property, plant and equipment, and intangible assets

The borrowing costs of the power plant construction in progress, OL3 project, have been capitalized. Realized financial income and expenses have been divided by committed capital. The average share of capitalized borrowing costs in 2019 was 100.00 % (99.76 % in 2018). For the average interest rate on loans and derivatives on 31 December, see note 27.

Capitalized interest costs during construction

2019

EUR 1,000	Other intangible assets	Buildings and construction	Machinery and equipment	Other property, plant and equipment	Advance payments	Total
Acquisition cost 1 Jan	1,167	27,122	95,394	2,402	1,362,033	1,488,118
Increase	0	0	0	0	105,581	105,581
Decrease	0	0	0	0	-4,699	-4,699
Acquisition cost 31 Dec	1,167	27,122	95,394	2,402	1,462,915	1,589,000
Accumulated depreciation and impairment charges according to plan 1 Jan	899	20,884	73,455	1,850	0	97,089
Depreciation for the period	12	284	997	25	0	1,318
Accumulated depreciation and impairment charges according to plan 31 Dec	911	21,168	74,452	1,875	0	98,407
Book value 31 Dec 2019	**256**	**5,954**	**20,942**	**527**	**1,462,915**	**1,490,594**
Book value 1 Jan 2019	268	6,238	21,939	552	1,362,033	1,391,030

2018

EUR 1,000	Other intangible assets	Buildings and construction	Machinery and equipment	Other property, plant and equipment	Advance payments	Total
Acquisition cost 1 Jan	3,530	31,133	112,781	2,609	1,254,377	1,404,429
Increase	0	0	0	0	110,375	110,375
Decrease	-2,363	-4,011	-17,386	-207	-2,719	-26,686
Acquisition cost 31 Dec	1,167	27,122	95,394	2,402	1,362,033	1,488,118
Accumulated depreciation and impairment charges according to plan 1 Jan	3,155	24,451	89,149	2,024	0	118,779
Accumulated depreciation from deduction	-2,363	-4,011	-17,386	-207	0	-23,967
Depreciation for the period	107	444	1,693	33	0	2,277
Accumulated depreciation and impairment charges according to plan 31 Dec	899	20,884	73,455	1,850	0	97,089
Book value 31 Dec 2018	**268**	**6,238**	**21,939**	**552**	**1,362,033**	**1,391,030**
Book value 1 Jan 2018	375	6,682	23,632	585	1,254,377	1,285,650

14 Investments in joint ventures

EUR 1,000	2019	2018
Posiva Group	7,374	5,989
31 Dec	**7,374**	**5,989**

Nature of investment in joint ventures:

Name of entity	Place of incorporation	Group share, %	Measurement method
Posiva Oy - A series	Eurajoki	60	Equity
Posiva Oy - B series	Eurajoki	74	Equity

TVO has a 60 percent shareholding in Posiva Oy. Posiva is responsible for the research and implementation of final disposal of spent nuclear fuel of its shareholders TVO and Fortum Power and Heat Oy (FPH).

TVO governs Posiva Oy jointly with FPH, based on the Articles of Association and Shareholders Agreement. TVO is liable for approximately 74 percent of Posiva's expenses. The duty of Posiva is to carry out all tasks related to the final disposal of spent nuclear fuel of its shareholders' nuclear power plants in Finland in order to fulfill their nuclear waste management obligation as specified in the Nuclear Energy Act. The company's operations also include research and construction related to the final disposal solution. Management of spent fuel is carried out according to the detailed plan examined by Finnish Centre for Radiation and Nuclear Safety and approved by The Ministry of Employment and the Economy.

Posiva Solutions Oy, a wholly-owned subsidiary of Posiva Oy, was founded on May 20, 2016. Posiva Solutions Oy focuses on the sales of the know-how Posiva has accumulated from its design, research and development activities in the final disposal of spent nuclear fuel, as well as on associated consulting services.

Summarized financial information (FAS) for Posiva Group

Posiva Oy and Posiva Solutions Oy are private companies and there are no quoted market prices available for their shares.

In the consolidated financial statements Posiva Group is accounted by the equity method of accounting.

Summarized balance sheet

EUR 1,000	Posiva Group 2019	Posiva Group 2018
Current		
Cash and cash equivalents	17,023	15,079
Other current assets (excluding cash)	10,326	8,069
Total current assets	27,349	23,147
Financial liabilities (excluding trade payables)	-378	-378
Other current liabilities (including trade payables)	-13,601	-11,603
Total current liabilities	-13,979	-11,981
Non-current		
Assets	986	1,465
Financial liabilities	-4,029	-4,185
Total non-current liabilities	-4,029	-4,185
Net assets	**10,327**	**8,446**

Summarized statement of comprehensive income	2019	2018
Turnover	85,372	76,725
Depreciation and impairment charges	-37	-50
Interest income	1	18
Interest expense	-69	-43
Pre-tax profit from continuing operations	2,355	2,359
Income tax expense	-474	-475
Post-tax profit from continuing operations	**1,881**	**1,884**

Reconciliation of summarized financial information	2019	2018
Operating net assets 1 Jan	8,446	6,562
Profit/loss for the period	1,881	1,884
Closing net assets	**10,327**	**8,446**
Interest in joint venture	7,374	5,989
Carrying value	**7,374**	**5,989**

15 Book values of financial assets and liabilities by categories

2019 EUR 1,000	Fair value through profit or loss	At fair value through other comprehensive income items	Amortized cost	Book value total	Fair value total	Note
Non-current assets						
Loans and other receivables			596,417	596,417	596,417	16
Share investments		1,934		1,934	1,934	17
Derivative financial instruments, no hedge accounting	5,882			5,882	5,882	20
Derivative financial instruments, cash flow hedge accounting		11,049		11,049	11,049	20
Derivative financial instruments, fair value hedge accounting	12,322			12,322	12,322	20
Current assets						
Trade and other receivables			73,262	73,262	73,262	16
Derivative financial instruments, no hedge accounting	11,858			11,858	11,858	20
Derivative financial instruments, cash flow hedge accounting		4,001		4,001	4,001	20
Derivative financial instruments, fair value hedge accounting						
Fund holdings						
Total by category	**30,063**	**16,984**	**669,679**	**716,726**	**716,726**	
Non-current liabilities						
Loan from the Finnish State Nuclear Waste Management Fund			591,441	591,441	591,441	22
Other financial liabilities			3,899,238	3,899,238	4,046,541	22
Derivative financial instruments, no hedge accounting	9,922			9,922	9,922	20
Derivative financial instruments, cash flow hedge accounting		19,898		19,898	19,898	20
Derivative financial instruments, fair value hedge accounting						
Current liabilities						
Current financial liabilities			422,769	422,769	422,769	22
Trade payables			6,655	6,655	6,655	23
Other current liabilities			95,582	95,582	95,582	23
Derivative financial instruments, no hedge accounting	17,426			17,426	17,426	20
Derivative financial instruments, cash flow hedge accounting		940		940	940	20
Derivative financial instruments, fair value hedge accounting						
Total by category	**27,348**	**20,838**	**5,015,685**	**5,063,870**	**5,211,173**	

2018 EUR 1,000	Fair value through profit or loss	At fair value through other comprehensive income items	Amortized cost	Book value total	Fair value total	Note
Non-current assets						
Loans and other receivables			669,295	669,295	669,295	16
Share investments		1,934		1,934	1,934	17
Derivative financial instruments, no hedge accounting	8,673			8,673	8,673	20
Derivative financial instruments, cash flow hedge accounting		10,744		10,744	10,744	20
Derivative financial instruments, fair value hedge accounting	12,582			12,582	12,582	20
Current assets						
Trade and other receivables			149,640	149,640	149,640	16
Derivative financial instruments, no hedge accounting	307			307	307	20
Derivative financial instruments, cash flow hedge accounting		4,498		4,498	4,498	20
Derivative financial instruments, fair value hedge accounting	435			435	435	20
Fund units						
Total by category	**21,997**	**17,176**	**818,935**	**858,108**	**858,108**	
Non-current liabilities						
Loan from the Finnish State Nuclear Waste Management Fund			666,242	666,242	666,242	22
Other financial liabilities			3,650,497	3,650,497	3,735,829	22
Derivative financial instruments, no hedge accounting	18,142			18,142	18,142	20
Derivative financial instruments, cash flow hedge accounting		11,870		11,870	11,870	20
Derivative financial instruments, fair value hedge accounting						
Current liabilities						
Current financial liabilities			459,513	459,513	459,513	22
Trade payables			7,184	7,184	7,184	23
Other current liabilities			130,301	130,301	130,301	23
Derivative financial instruments, no hedge accounting	73			73	73	20
Derivative financial instruments, cash flow hedge accounting		872		872	872	20
Derivative financial instruments, fair value hedge accounting						
Total by category	**18,215**	**12,743**	**4,913,737**	**4,944,695**	**5,030,026**	

Fair values of long-term loans have been estimated as follows:

The fair value of quoted bonds is based on the quoted market value as of 31 December (Level 1). The fair value of fixed rate and market-based floating rate loans is estimated using the expected future payments discounted at market interest rates (Level 2).

The carrying amounts of current financial assets and liabilities approximate their fair value, as the impact of discounting is not significant.

Disclosure of fair value measurements by the level of fair value measurement hierarchy

2019 EUR 1,000	Level 1	Level 2	Level 3
Financial assets at fair value			
Derivative financial instruments, no hedge accounting		17,741	
Derivative financial instruments designated as cash flow hedges		15,050	
Derivative financial instruments designated as fair value hedges		12,322	
Fund units			
Share investments			1,934
Total	**0**	**45,113**	**1,934**
Financial liabilities at fair value			
Derivative financial instruments at fair value through profit or loss		27,348	
Derivative financial instruments designated as cash flow hedges		20,838	
Derivative financial instruments designated as fair value hedges			
Total	**0**	**48,185**	**0**

2018 EUR 1,000	Level 1	Level 2	Level 3
Financial assets at fair value			
Derivative financial instruments, no hedge accounting		8,981	
Derivative financial instruments designated as cash flow hedges		15,242	
Derivative financial instruments designated as fair value hedges		13,016	
Fund units			
Share investments			1,934
Total	**0**	**37,239**	**1,934**
Financial liabilities at fair value			
Derivative financial instruments at fair value through profit or loss		18,215	
Derivative financial instruments designated as cash flow hedges		12,743	
Derivative financial instruments designated as fair value hedges		0	
Total	**0**	**30,958**	**0**

Fair value estimation

The derivative financial instruments are initially recognized at fair value on the date a derivative contract is entered into and are subsequently measured at fair value. The fair values are determined using a variety of methods and financial valuation techniques, and assumptions are based on market quotations at the balance sheet date (Level 2). The fair value of the interest rate swaps is the present value of the estimated future cash flows. The forward contracts are measured using the market quotes at the closing date. The fair value of the interest rate options is calculated using market quotes at the closing date and by using the Black and Scholes option valuation model. The changes in fair value of the interest rate swaps and forward contracts are recognized in equity or profit or loss, depending on whether they qualify for cash flow hedges or not. The changes in fair value of interest rate options that do not qualify for hedge accounting are presented in the income statement.

On 31 December 2019, TVO has unquoted shares worth EUR 1,934 (2018: 1,934) thousand. Direct market prices are not available for unquoted shares and therefore their fair value is determined using methods based on management judgement.

Offsetting financial assets and liabilities

2019 EUR 1,000	Gross amounts	Related amounts not set off	Net amount
Derivative financial assets	45,113	-25,679	19,434
Derivative financial liabilities	-48,185	25,679	-22,506

2018 EUR 1,000	Gross amounts	Related amounts not set off	Net amount
Derivative financial assets	37,239	-14,375	22,864
Derivative financial liabilities	-30,958	14,375	-16,584

For the financial derivative assets and liabilities subject to enforceable master netting arrangements or similar arrangements above, each agreement between the Group and the counterparty allows for net settlement of the relevant financial derivative assets and liabilities when both elect to settle on a net basis. In the absence of such an election, financial assets and liabilities will be settled on a gross basis, however, each party to the master netting agreement or similar agreement will have the option to settle all such amounts on a net basis in the event of default of the other party. Per the terms of each agreement, an event of default includes failure by a party to make payment when due.

16 Loans and other receivables

Loans and other receivables (non-current assets)

EUR 1,000	2019	2018
Nuclear waste management loan receivables	591,441	666,242
Loan receivables	4,976	3,053
Total	**596,417**	**669,295**

According to section 52 of the Nuclear Energy Act, TVO, in exchange for collateral payments, is entitled to receive fixed-term loans from the Finnish State Nuclear Waste Management Fund, the amount which cannot be larger than 75 percent of the latest confirmed TVO's share in the Finnish State Nuclear Waste Management Fund. The nuclear waste management loan receivables formed by the amount loaned from the Finnish State Nuclear Waste Management Fund has been further loaned (with the same terms and conditions) to the equity holders of the company and to Fortum Oyj.

Nuclear waste management loan receivables are allocated as follows:

EUR 1,000	2019	2018
EPV Energia Oy	74,009	72,289
Fortum Oyj	300,214	293,236
Loiste Holding Oy	790	772
Kemira Oyj	20,995	20,507
Oy Mankala Ab	0	83,580
Pohjolan Voima Oyj	195,433	195,859
Total	**591,441**	**666,242**

In accordance with its Articles of Association, TVO delivers electricity to its shareholders at cost price (so-called Mankala principle), i.e. delivers the electricity produced or procured to its shareholders in proportion to their shareholdings in each series. Each of the shareholders of each series is liable for variable and fixed annual costs that are specified in detail in the Articles of Association.

The loan receivables constitute mainly the loan receivables of Posiva Oy EUR 2,442 (2,548) thousand.

TVO's management has estimated that TVO is entitled to receive the penalty compensation EUR 318 million agreed in the comprehensive settlement agreement from Plant Supplier assuming that the start of regular electricity production of the OL3 EPR nuclear power plant unit will take place in March 2021. Receivable has not been recorded on 31 December 2019.

Trade and other receivables (current assets)

EUR 1,000	2019	2018
Trade receivables	18,096	18,461
Loan receivables	240	240
Prepayments and accrued income	53,935	130,623
Other receivables	991	316
Total	**73,262**	**149,640**

Prepayments and accrued income include prepaid interests, accrued interest income, other accrued income and other prepaid expenses.

The maximum credit loss risk of trade and other receivables corresponds to their book value. On 31 December 2019 the Group had EUR 211 (145) thousand overdue receivables of which EUR 0 (0) thousand was overdue more than six months. The overdue receivables are not expected to cause the Group credit losses or impairments.

17 Investments in shares

EUR 1,000	2019	2018
Share investments	1,934	1,934
Total	**1,934**	**1,934**

18 Cash and cash equivalents

Cash and cash equivalents consist of on-hand cash, demand deposits and other current, liquid investments.

19 Inventories

EUR 1,000	2019	2018
Coal		
Replacement cost	0	610
Book value	0	550
Difference	**0**	**60**
Raw uranium and natural uranium		
Replacement cost	79,630	80,741
Book value	91,772	81,370
Difference	**-12,142**	**-628**
Coal	0	550
Raw uranium and natural uranium	91,772	81,370
Nuclear fuel	170,083	171,436
Materials and supplies	8,001	7,238
Total	**269,856**	**260,594**

20 Derivative financial instruments

Nominal values of the derivative financial instruments

2019	Maturity structure					
EUR 1,000	<1 year	1–3 years	3–5 years	5–7 years	>7 years	Total
Interest rate swaps	431,955	739,117	265,000	300,000	260,000	1,996,071
Forward foreign exchange contracts and swaps [1]	36,107	40,640	21,489	10,981	0	109,217
Cross-currency swaps	211,042	153,678	224,893	0	0	589,613
Total	**679,103**	**933,435**	**511,382**	**310,981**	**260,000**	**2,694,902**

2018	Maturity structure					
EUR 1,000	<1 year	1–3 years	3–5 years	5–7 years	>7 years	Total
Interest rate swaps	360,000	911,955	624,117	300,000	0	2,196,071
Forward foreign exchange contracts and swaps [1]	26,328	45,484	27,962	21,854	0	121,628
Cross-currency swaps	58,270	211,042	153,678	131,707	0	554,697
Total	**444,598**	**1,168,481**	**805,757**	**453,561**	**0**	**2,872,397**

[1] Forward contracts are mainly used for hedging fuel purchases against currency risk. The opposite forward contracts, which have been acquired to adjust these hedging amounts are netted in the table with each other, whereby the nominal describes the protected position.

Fair values of the derivative financial instruments

2019

EUR 1,000	Positive	Negative	Total
Interest rate swaps			
Cash flow hedges		-20,598	-20,598
Fair value hedges	12,322		12,322
Non-hedges		-5,825	-5,825
Forward foreign exchange contracts and swaps			
Cash flow hedges	15,050	-240	14,810
Non-hedges	2,657	-149	2,508
Cross-currency swaps			
Non-hedges	15,084	-21,373	-6,289
Total	**45,113**	**-48,185**	**-3,073**

2018

EUR 1,000	Positive	Negative	Total
Interest rate swaps			
Cash flow hedges		-12,199	-12,199
Fair value hedges	13,016		13,016
Non-hedges		-3,105	-3,105
Forward foreign exchange contracts and swaps			
Cash flow hedges	15,242	-544	14,698
Non-hedges	758	-112	646
Cross-currency swaps			
Non-hedges	8,222	-14,998	-6,775
Total	**37,239**	**-30,958**	**6,281**

The effect of hedge accounting in financial position and result

The interest rate hedging in fair value hedge accounting

EUR 1,000	2019	2018
The book value of the derivative financial instruments, receivables	12,322	13,016
The book value of the derivative financial instruments, liabilities	0	0
Nominal value	423,000	673,000
Due date	03/2021–02/2025	02/2019–02/2025
The book value of the hedged item, receivables	0	0
The book value of the hedged item, liabilities	423,000	673,000
The degree of hedging	1:1	1:1
The change of the basic value in valid hedging instruments since 1 Jan	744	-4,379
The effectiveness of the hedge used to determine the change of value for the hedged item	-735	4,764
The weighted average interest rate during the year	1.19%	1.56%

The interest rate hedging in cash flow hedge accounting

EUR 1,000	2019	2018
The book value of the derivative financial instruments, receivables	0	0
The book value of the derivative financial instruments, liabilities	20,598	12,199
Nominal value	1,073,071	973,071
Due date	03/2020–06/2029	02/2019–02/2025
The degree of hedging	1:1	1:1
The change of the basic value in valid hedging instruments since 1 Jan	-8,399	-1,918
The effectiveness of the hedge used to determine the change of value for the hedged item	8,417	1,962
The weighted average interest rate during the year	1.31%	1.18%

The currency hedging in cash flow hedge accounting

EUR 1,000	2019	2018
The book value of the derivative financial instruments, receivables	15,050	15,242
The book value of the derivative financial instruments, liabilities	240	544
Nominal value	109,217	121,628
Due date	01/2020–01/2025	01/2019–01/2025
The degree of hedging	1:1	1:1
The change of the spot value in valid hedging instruments since 1 Jan	5,401	7,959
The effectiveness of the hedge used to determine the change of value for the hedged item	-5,401	-7,959
The weighted average of protected rate (incl. forward points) during the year (USD)	1.37	1.38
The weighted average of protected rate (incl. forward points) during the year (SEK)	10.47	9.57

21 Equity

Share capital

The registered share capital of the Company according to the Articles of Association was EUR 600,365 thousand on 31 December 2019. TVO does not have a maximum or minimum limit for the share capital. The number of the shares on 31 December 2019 was 1,394,283,730. The shares are divided into the three series of shares as follows: A series 680,000,000, B series 680,000,000 and C series 34,283,730 shares. The shares have no nominal price as is stipulated in the Finnish Limited Liability Companies Act.

According to the Articles of Association, TVO delivers electricity to its shareholders at cost price, i.e. it delivers the electricity produced or procured to its shareholders in proportion to their shareholding in each series. Each of the shareholders of each series is liable for the variable and fixed annual costs that are specified in detail in the Articles of Association. The Company prepares annually a balance sheet divided into series of shares. The balance sheet, which will be presented to the Shareholders' Meeting, specifies the assets, liabilities and equity of the different series of shares.

At TVO's Extraordinary General Meeting held in June 2018, TVO and its shareholders agreed on ownership arrangements of shares entitling to a share of Meri-Pori power plant's production capacity. TVO will relinquish its share in Meri-Pori in full in the beginning of July 2020. Because of the arrangements the EGM decided to amend the Articles of Association by removing all provisions pertaining Meri-Pori shares and to reduce the share capital by the proportionate amount of share capital allocated to these shares (class C shares). The amendments of the Articles of Association were registered at the same time as the decrease in the share capital was registered in October 2018. The other amendments to the Articles of Association will be registered when the cancellation of class C shares is registered.

Share number reconciliations:

EUR 1,000	Number of shares	Share capital	Share premium reserve and statutory reserve	Reserve for invested non-restricted equity
1 Jan 2018	1,394,283,730	606,193	242,383	0
31 Dec 2018	1,394,283,730	600,365	242,383	3
31 Dec 2019	**1,394,283,730**	**600,365**	**242,383**	**3**

The company has three registered share series: A, B and C.

Share number

	31 Dec 2019	31 Dec 2018
A series	680,000,000	680,000,000
B series	680,000,000	680,000,000
C series	34,283,730	34,283,730
Total	**1,394,283,730**	**1,394,283,730**

Share premium reserve

The share premium reserve contains the share premiums of the share issues, EUR 232,435 thousand.

Statutory reserve

The statutory reserve consists of EUR 9,948 thousand paid by Imatran Voima Oy, the predecessor of Fortum Power and Heat Oy, in 1979 when it became an equity holder in the company.

Reserve for invested non-restricted equity

The carrying value of reserve for invested non-restricted equity in the balance sheet 31 December 2019 was EUR 3 thousand.

Fair value and other reserves

Profits and losses incurred by fair value changes of available-for-sale investments and derivatives used as cash flow hedges are entered in this reserve. The fair changes of derivatives are transferred to the profit/loss statement, when the cash flows they have been hedging have been realized. Fair value changes in available-for-sale investments are transferred to the income statement, when the investments are relinquished or their value diminishes.

Subordinated shareholder loans (hybrid equity)

The carrying value of the interest-bearing subordinated shareholder loans in the balance sheet 31 December 2019 was EUR 679,300 thousand. There is no maturity date for the subordinated shareholder loans (hybrid equity), but the borrower is entitled to repay the loan in one or several installments. The Board of Directors of the borrower has the right to decide not to pay interest during any current interest period. Unpaid interest does not accumulate to the following interest periods.

Subordinated shareholder loans (hybrid equity) are unsecured and in a weaker preference position than promissory notes. Holders of a subordinated shareholder loans have no shareholder rights, nor does the bond dilute the ownership of the company's shareholders.

Retained earnings

This item contains the earnings from previous financial periods and the profit/loss of the financial year.

22 Interest-bearing liabilities

EUR 1,000	2019	2018
Non-current interest-bearing liabilities		
Loan from the Finnish State Nuclear Waste Management Fund	591,441	666,242
Bonds	2,858,937	2,582,556
Loans from financial institutions	925,564	867,602
Loans from others	63,568	148,033
Lease liabilities	51,169	52,306
Derivative financial instruments	29,820	30,252
Total	**4,520,499**	**4,346,991**
Current interest-bearing liabilities		
Current portion of long-term bonds	114,894	251,958
Current portion of loans from financial institutions	44,413	44,413
Current portion of Private Placements	89,015	0
Current portion of lease liabilities	1,992	1,726
Other interest-bearing liabilities (Commercial paper program)	172,455	161,416
Derivative financial instruments	18,365	706
Total	**441,134**	**460,219**
Total	**4,961,633**	**4,807,210**

TVO has 31 December 2019 issued EUR-, USD-, GBP-, and SEK-denominated Private Placements amounting to EUR 925.6 million. The Placements in foreign currency are treated as EUR floating or fixed rate loans that are adjusted at the closing date with ECB fixing rate. The Private Placements have been swapped by using cross-currency swaps. In 2019, the effect of foreign exchange hedges was positive, amounting to EUR 0.5 million and correspondingly, the effect of foreign currency denominated loans was negative, amounting to EUR 0.5 million.

Maturity period of finance lease liabilities

EUR 1,000	2019	2018
Finance lease liabilities - minimum lease payments		
No later than 1 year	-	1,735
Later than 1 year and no later than 5 years	-	7,028
Over 5 years	-	45,327
Total	**-**	**54,090**
Finance expenses to be accrued	-	58
Finance lease liabilities - current value of minimum rents		
No later than 1 year	-	1,726
Later than 1 year and no later than 5 years	-	6,992
Over 5 years	-	45,314
Total	**-**	**54,032**

The finance lease liabilities of the Group comprise the lease agreement of spare parts of the nuclear power plant.

Finance lease liabilities were included in interest-bearing liabilities until 31 December 2018, but were reclassified to lease liabilities on 1 January 2019 in the process of adopting the new leasing standard (IFRS 16). See note 12 Property, plant and equipment for further information about the change in accounting policy for leases.

23 Trade payables and other current liabilities

EUR 1,000	2019	2018
Advances received	17,788	20,398
Trade payables	6,655	7,184
Accruals and deferred income and other liabilities	95,582	130,301
Total	**120,025**	**157,883**

Accruals and deferred income and other liabilities are allocated as follows:

EUR 1,000	2019	2018
Finnish State Nuclear Waste Management Fund	3,364	29,818
Accrued interests	39,036	44,157
Accrued personnel expenses	18,395	18,140
Accruals related to CO_2 emission rights	3,760	8,835
Others	31,027	29,352
Total	**95,582**	**130,301**

24 Assets and provision related to nuclear waste management obligation

Share in the Finnish State Nuclear Waste Management Fund

Under the Nuclear Energy Act in Finland, TVO has a legal obligation to fully fund the legal liability for nuclear waste including the decommissioning of the power plant through the Finnish State Nuclear Waste Management Fund (= nuclear waste management obligation).

TVO contributes funds to the Finnish State Nuclear Waste Management Fund to cover future obligations based on the legal liability calculated according to the Nuclear Energy Act. The carrying value of the fund in TVO's balance sheet is calculated according to the interpretation in IFRIC 5 "Rights to Interests arising from Decommissioning, Restoration and Environmental Rehabilitation Funds".

Provision related to the nuclear waste management obligation

The provision is related to future obligations for decommissioning of the power plant, management of spent fuel and operating waste. The fair value of the provision is calculated according to IAS 37 based on discounted future cash flows which are based on estimated future expenses. The cost estimate is based on a nuclear waste management plan covering the management of spent nuclear fuel and operating waste and decommissioning of the nuclear power plant. The new total cost estimate based on a new nuclear waste management technical plan and schedule is updated every third year. The technical plans, timing and cost estimates are approved by Finnish governmental authorities.

The total cost estimate based on a new nuclear waste management technical plan and schedule was updated in June 2019. The costs for spent fuel disposal are expensed during the operating time of the plant, based on fuel usage, and the impact of any changes to the plan and schedules will be recognized immediately in the income statement based on fuel used by the end of each accounting period.

The provision on 30 June 2019 on balance sheet compared to the value at the end of the previous year increased by EUR 37.2 million. The effect of revised cost estimate to the consolidated income statement on 30 June 2019 compared to the previous estimate were EUR 32.2 million decrease in materials and services and EUR 11.9 million decrease in finance expenses. The overall effect on profit for the period is positive because the amount of the share in the Finnish State Nuclear Waste Management Fund and the provision related to nuclear waste management are equal, and the difference is entered as an adjustment to materials and services.

At the end of the year, the balance sheet contains the following assets and liabilities concerning the nuclear waste management obligation:

EUR 1,000	2019	2018
The carrying value of TVO's share in the Finnish State Nuclear Waste Management Fund (non-current assets)	1,040,826	952,020
Provision related to nuclear waste management (non-current liabilities)		
Beginning of the year	952,020	953,136
Increase/decrease in provision	205,706	-13,484
Used provision	-37,528	-32,108
Changes due to discounting	-79,372	44,476
End of the year	1,040,826	952,020
The discount rate %	4.0	5.5

TVO's legal liability as stated in the Nuclear Energy Act and the Company's share in the Finnish State Nuclear Waste Management Fund

EUR 1,000	2019	2018
Liability for nuclear waste management according to the Nuclear Energy Act	1,471,400	1,505,800
TVO's funding target obligation 2020 (2019) to the Finnish State Nuclear Waste Management Fund	1,471,400	1,505,800
TVO's share in the Finnish State Nuclear Waste Management Fund 31 Dec 2019 (31 Dec 2018)	1,513,500	1,480,000
Difference between the liability and TVO's share of the fund 31 Dec 2019 (31 Dec 2018)	-42,100	25,800

The legal liability calculated according to the Nuclear Energy Act in Finland and decided by the supervising authority (the Ministry of Employment and the Economy) is EUR 1,471.4 (1,505.8) million on 31 December 2019 (31 December 2018). The carrying value of the liability in the balance sheet calculated according to IAS 37 is EUR 1,040.8 (952.0) million on 31 December 2019. The main reason for the difference between the carrying value of the provision and the legal liability is the fact that the legal liability is not discounted to net present value. Since the future cash flow is spread over 100 years, the difference between non-discounted legal liability and the discounted provisions are remarkable. The discount rate used in calculating fair value of assets and debts related to nuclear waste management liability was updated in December 2019. The change in the discount rate has an effect on the provision. The provision increases when the discount rate used is lowered.

TVO's share in the Finnish State Nuclear Waste Management Fund is EUR 1,513.5 (1,480.0) million on 31 December 2019. The carrying value of TVO's share in the fund in the balance sheet is EUR 1,040.8 (952.0) million. The difference is due to the fact that IFRIC 5 limits the carrying amount of TVO's share in the Finnish State Nuclear Waste Management Fund to the amount of the related liability since TVO does not have control over the Finnish State Nuclear Waste Management Fund. As long as the Fund is overfunded from an IFRS perspective, the effects to operating profit from this adjustment will be positive if the provision increases more than the Fund, and negative if actual value of the fund increases more than the provision.

The difference between the funding target and the share in the Finnish State Nuclear Waste Management Fund at the end of each year is due to the funding target being completed by paying the nuclear waste management fee only during the first quarter of the following year. Assets will be refunded from the Nuclear Waste Management Fund to TVO in respect of 2019 according to the rules of the Fund, since the nuclear waste management liability of TVO is lower in the end of 2019 than in the end of 2018 based on the decrease of nuclear waste management's total cost estimate updated every three years.

TVO has issued to the State the shareholders' guarantees as security for the unfunded legal liability. The security also covers unexpected events as determined in the Nuclear Energy Act. The guarantees are included in the nuclear waste management obligations, see note 25 Obligations and other commitments.

Finnish participants in the State Nuclear Waste Management Fund are allowed to borrow from the Fund according to defined rules. TVO utilizes the right to borrow funds back and has pledged the receivables from the shareholders as security for the loans. The loans are renewed annually. The loans are included in the interest-bearing liabilities, see note 22 Interest-bearing liabilities.

25 Obligations and other commitments

Operating leases

Group as lessee

Minimum rents to be paid based on non-cancellable lease agreements:

EUR 1,000	2019	2018
No later than 1 year	-	697
Later than 1 year and no later than 5 years	-	765
Total	**-**	**1,462**

The rents recognized as expenses during the period are as follows:

EUR 1,000	2019	2018
Rents	-	637
Total	**-**	**637**

Non-cancellable lease agreements have been made for the office equipment and vehicles.

From 1 January 2019, the Group has recognized right-of-use assets for these leases, except for short-term and low-value leases. See note 12 Property, plant and equipment for further information.

Pledged promissory notes and financial guarantees

EUR 1,000	2019	2018
Pledged promissory notes to the Finnish State Nuclear Waste Management Fund	591,441	666,242
Guarantees given by shareholders related to the nuclear waste management obligation	77,980	135,970

The Company under the nuclear waste management obligation is entitled to borrow an amount equal to 75 percent of its share in the Finnish State Nuclear Waste Management Fund. TVO has lent the funds borrowed from the fund to its shareholders and has pledged the receivables from the shareholders as collateral for the loan.

The absolute guarantees given by the equity holders of the company are given to cover the unfunded portion of the nuclear waste management obligation and unexpected events as determined in the Nuclear Energy Act.

Commitments

Contingent liabilities given on own behalf

EUR 1,000	2019	2018
Bank guarantees	7,000	7,000

Investment commitments

Agreement-based commitments regarding the acquisition of property, plant and equipment:

EUR 1,000	2019	2018
OL1 and OL2	80,600	88,500
OL3	411,800	351,300
Total	**492,400**	**439,800**

Pending court cases and disputes

TVO and Wärtsilä Finland Oy (Wärtsilä) signed an agreement on delivery of Emergency Diesel Generators and their auxiliary systems to Olkiluoto nuclear power plant (the so-called EDG project) in 2013. In December 2018, Wärtsilä published a stock exchange release announcing a major provision it has made on two nuclear power plant projects to cover the excess costs and project delays, and that the allocation of responsibility for the additional costs and delays are in dispute. In April 2019, Wärtsilä announced in its notification addressed to TVO that EUR 65.0 million of the provision applies to TVO's EDG project. In addition, Wärtsilä announced that internal clearance on the costs that will be demanded from TVO is still ongoing. At the end of the year, the status of the dispute was unchanged. TVO has not recorded any receivables or provisions concerning the case.

CO_2 emission rights

In principle TVO has, on 31 December, emission rights at least the same amount as the actual annual emissions are. If the actual emissions exceed the amount of the emission rights that TVO possesses, TVO has booked the expense for exceeding emission rights at the market value on 31 December.

		2019		2018
	t CO_2	EUR 1,000	t CO_2	EUR 1,000
Total annual emissions from production facilities	161,924		525,815	
Possessed emission rights	162,546		531,792	
Emission rights bought [1]	214,200	5,142	530,000	8,835

TVO is responsible for the amount of emission rights corresponding to its share of the production of the plant.

[1] The purchases of the emission rights are included in materials and services. The emission rights that TVO possesses on 31 December are included in intangible assets on the balance sheet.

26 Related party

The Group's related parties include parent company Teollisuuden Voima Oyj and its subsidiary and joint ventures. The related parties also include the Board of Directors and the Executive Management, including the President and CEO and Deputy CEO.

Group's parent company and subsidiaries

Company	Home country	Ownership, %	Share in voting rights, %
Teollisuuden Voima Oyj	Finland		
TVO Nuclear Services Oy	Finland	100	100

Transactions with related parties are as follows

2019 EUR 1,000	Sales	Purchases	Receivables	Liabilities
Posiva Group	11,522	57,450	4,769	3,831

2018 EUR 1,000	Sales	Purchases	Receivables	Liabilities
Posiva Group	10,309	52,554	4,018	1,974

Teollisuuden Voima Oyj's shareholders

According to IAS 24 -standard, in addition the Group related parties are TVO's two biggest shareholders Pohjolan Voima Oyj (PVO) and Fortum Power and Heat Oy (FPH) which have significant authority and PVO's biggest owner UPM-Kymmene Oyj (UPM) and FPH's owner Fortum Oyj.

Transactions with related parties are as follows

2019 EUR 1,000	Sales	Purchases	Receivables	Liabilities
PVO, Fortum Oyj, Fortum Power and Heat Oy	211,181	26,431	514,476	603,264

2018 EUR 1,000	Sales	Purchases	Receivables	Liabilities
PVO, Fortum Oyj, Fortum Power and Heat Oy	287,885	31,194	634,843	515,045

Senior management's employee benefits

The senior management of TVO comprises the Board of Directors and the Executive Management, including President and CEO and Deputy CEO. The Group has no business transactions with senior management.

EUR 1,000	2019 Senior management	2018 Senior management
Wages, salaries and other short-term benefits	2,564	2,352
Total	**2,564**	**2,352**

27 Financial risk management

Financing and financial risks are centrally managed by the finance operations of TVO Group in accordance with the Finance Policy approved by the Board of Directors. Compliance with the Finance Policy is monitored by the Board of Directors and the Company's management. The SVP, Treasury is responsible for financing operations. TVO Group is exposed to a variety of financial risks: liquidity-, market- and credit risk. These do not include the receivables and obligations between the Company and its owners, as the Company operates at cost price (see note 1 General information on the Group).

TVO Group's guiding financial principles are to ensure access to adequate liquidity reserves and, secondly, to reduce volatility in cash flows deriving form short- and medium-term fluctuations in the financial markets.

In accordance with the Finance Policy of the Company, derivative instruments are entered into only with hedging purposes and they should qualify for hedge accounting under IFRS.

Liquidity risk

Liquidity and refinancing risk is defined as the amount by which earnings and cash flows are affected as a result of the Company not being able to secure sufficient financing. In addition to sufficient liquid assets and committed credit lines TVO Group aims to diminish the refinancing risk by spreading the maturity dates of its loans and different financing sources as much as possible.

In accordance with the Finance Policy of TVO Group, the maturities and refinancing of long-term loans are planned so that no more than 25 percent of the outstanding loans mature during the next rolling 12-month period. The loans borrowed from the Finnish State Nuclear Waste Management Fund, which have been lent further to the shareholders, form an exception.

TVO Group issues commercial papers under the Commercial Paper Program for short-term funding purposes. There shall always exist committed credit lines with a minimum duration of 12 months for an amount corresponding to the funding needs of the Company for the following 12 months.

In addition to long-term committed credit lines, the Company shall maintain liquid assets at an amount stated in the Finance Policy. In accordance with the Finance Policy, bank deposits, certificates of deposits, commercial papers, municipal papers, and treasury notes as well as money market funds are accepted as investments, and they are mostly for the short-term purposes with maximum duration of 12 months.

Undiscounted cash flows of financial liabilities

2019

EUR 1,000	2020	2021	2022	2023	2024–	Total
Loans from financial institutions [1]	44,413	149,498	619,698	50,608	116,234	980,451
Financing costs [2]	10,550	9,675	6,140	2,102	2,731	31,198
Loan from the Finnish State Nuclear Waste Management Fund [3]					591,441	591,441
Financing costs	2,988	2,957	2,957	2,957	3,480	15,339
Bonds [4]	131,955	153,781	250,561	500,000	1,957,900	2,994,196
Financing costs	53,759	57,082	52,873	49,235	93,217	306,167
Loans from others [4]	79,114		56,117			135,231
Financing costs	1,826	696	698			3,219
Lease liabilities	2,012	1,958	1,933	1,934	45,324	53,161
Commercial papers	172,455					172,455
Other liabilities	59,836					59,836
Interest rate derivatives	10,347	9,552	7,527	4,090	14,815	46,331
Total	**569,254**	**385,199**	**998,504**	**610,927**	**2,825,142**	**5,389,025**

EUR 1,000	2020	2021	2022	2023	2024–	Total
Forward foreign exchange contracts	285	80	28	0	0	394

[1] Repayments in 2020 are included in current liabilities in the balance sheet.

[2] In addition to interest costs, financing costs include commitment fees.

[3] The loan is renewed yearly and connected interest payments are calculated for five years.

[4] The placements in foreign currency have been swapped into EUR-floating or fixed cash flow using cross-currency swaps.

Undiscounted cash flows of financial liabilities

2018

EUR 1 000	2019	2020	2021	2022	2023–	Total
Loans from financial institutions [1]	44,413	44,413	235,213	505,413	95,413	924,864
Financing costs [2]	11,986	10,347	8,804	4,899	2,702	38,738
Loan from the Finnish State Nuclear Waste Management Fund [3]					666,242	666,242
Financing costs	3,364	4,260	6,343	8,370	10,298	32,635
Bonds [4]	251,719	131,955	500,000	250,561	1,714,707	2,848,941
Financing costs	58,594	58,172	57,703	44,793	111,295	330,557
Loans from others [4]		79,114		56,117		135,231
Financing costs	1,959	1,989	745	748		5,441
Finance lease liabilities	1,726	1,735	1,744	1,752	47,075	54,033
Commercial papers	161,416					161,416
Other liabilities	63,510					63,510
Interest rate derivatives	9,046	7,229	6,998	4,738	4,964	32,974
Total	**607,733**	**339,212**	**817,549**	**877,390**	**2,652,697**	**5,294,582**

EUR 1 000	2019	2020	2021	2022	2023–	Total
Forward foreign exchange contracts	-109	-147	-218	-213	0	-687

[1] Repayments in 2019 are included in current liabilities in the balance sheet.
[2] In addition to interest costs financing costs include commitment fees.
[3] The loan is renewed yearly and connected interest payments are calculated for five years.
[4] The placements in foreign currency have been swapped into EUR-floating or fixed cash flow using cross-currency swaps.

Market risk

Currency risk

TVO Group is exposed to currency risk mainly in connection with its fuel purchases. The currency of purchases of raw uranium, enrichment and coal is frequently USD. Hedging of a currency-denominated purchase is commenced when an agreement is entered into and the forecasted currency risk becomes highly probable. Both short-term and long-term loans are withdrawn mainly in euros. The loans denominated in other currencies than euros are hedged latest at the withdrawal date.

Currency swaps, forward contracts, and options can be used to hedge the currency exposure.

Interest rate risk

Interest-bearing liabilities expose the Company to interest rate risk. The objective of the Company's interest rate risk management is to maintain the interest costs at as low level as possible and to diminish the volatility of interest costs. In accordance with the Finance Policy, the duration of the loan portfolio of the Company can vary between 36 and 48 months. At the closing date the duration was 40 months.

The average interest rate duration is managed with fixed interest rate loans, interest rate swaps, forward rate agreements as well as with interest rate caps and floors.

The average interest rate on loans and derivatives on 31 December 2019 was 1.63% (2018: 1.81%).

Borrowings issued at variable rates expose TVO Group to cash flow interest rate risk. Borrowings issued at fixed rates expose TVO Group to fair value interest rate risk. TVO Group shall apply hedge accounting as far as practical. Based on the various scenarios, TVO Group manages its cash flow interest rate risk by using floating-to-fixed interest rate swaps. Such interest rate swaps have the economic effect of converting borrowings from floating rates to fixed rates. TVO Group also enters into fixed-to-floating interest rate swaps to hedge the fair value interest rate risk.

Expected cash flows from financial instruments under cash flow hedge accounting

2019

EUR 1,000	2020	2021	2022	2023	2024–	Total
Interest rate swaps						
Cash flows	-8,255	-6,968	-6,240	-2,803	-11,429	-35,694

2018

EUR 1,000	2019	2020	2021	2022	2023–	Total
Interest rate swaps						
Cash flows	-6,913	-5,332	-4,241	-3,585	-626	-20,697

Sensitivity to market risks

Sensitivity to market risks arising from financial instruments as required by IFRS 7.

		2019		**2018**
EUR 1,000	Income statement	Equity	Income statement	Equity
+ 10% change in EUR/USD and EUR/SEK exchange rates		-10,922		-12,134
- 10% change in EUR/USD and EUR/SEK exchange rates		10,922		12,134
1% upward parallel shift in interest rates	-10,904	38,425	-8,664	23,928
1% downward parallel shift in interest rates	11,165	-41,755	8,923	-11,488

Assumptions:

The change in EUR/USD and EUR/SEK exchange rates are assumed to be +/- 10 percent.

The currency position includes the forward foreign exchange contracts which are designated as cash flow hedges and recognized in equity and the forward foreign exchange contracts not qualified as cash flow hedges, affecting the income statement.

The variation in interest rates is assumed to be 1 percentage point parallel shift in the interest rate curve.

The interest rate risk position includes the floating rate loan receivables, interest-bearing borrowing, the interest rate derivatives and cash equivalents.

The income statement is affected by the interest-bearing loan receivables, floating rate borrowings and the interest rate derivatives, excluding those interest rate derivatives that are designated as and qualifying for cash hedges, which are recognized in equity. The gain or loss is recognized in profit or loss, except when they relate to the construction of OL3 and are capitalized in the balance sheet.

Bonds

Euro Medium Term Note Programme EUR 4.000.000.000

	2019		2018			
Currency	Nominal amount	Carrying amount	Nominal amount	Carrying amount	Interest rate %	Maturity date
EUR	0	0	193,452	193,452	4.625	04.02.2019
EUR	153,781	153,781	500,000	500,000	2.500	17.03.2021
EUR	30,000	30,000	30,000	30,000	3.880	09.05.2022
EUR	100,000	100,000	100,000	100,000	Euribor 6M + 1.580	12.09.2022
EUR	23,000	23,000	23,000	23,000	4.080	01.12.2022
EUR	20,000	20,000	20,000	20,000	2.800	08.05.2024
EUR	75,000	75,000	75,000	75,000	3.600	14.12.2027
EUR	23,000	23,000	23,000	23,000	3.500	03.05.2030
EUR	45,000	45,000	45,000	45,000	3.900	31.03.2032
EUR	20,000	20,000	20,000	20,000	3.875	08.11.2032
EUR	500,000	500,000	500,000	500,000	2.125	04.02.2025
EUR	500,000	500,000	500,000	500,000	2.625	13.01.2023
EUR	400,000	400,000	400,000	400,000	2.000	08.05.2024
EUR	650,000	650,000	0	0	1.125	09.03.2026
SEK	0	0	600,000	58,267	5.300	30.10.2019
SEK	650,000	70,945	650,000	70,945	Stibor 3M + 1.090	17.03.2020
SEK	550,000	61,009	550,000	61,009	2.840	19.05.2020
SEK	1,000,000	97,561	1,000,000	97,561	Stibor 3M + 1.17	15.02.2022
SEK	500,000	48,780	500,000	48,780	Stibor 3M + 1.78	15.02.2024
SEK	850,000	82,927	850,000	82,927	2.375	15.02.2024
SEK	500,000	46,624	0	0	Stibor 3M + 1.42	29.10.2024
SEK	500,000	46,568	0	0	1.557	29.10.2024
Total		**2,994,196**		**2,848,941**		

TVO Group debt structure by maturity

31 December 2019

EUR 1,000	2020	2021	2022	2023	2024	2025	2026	2027	2028–	Total
Loans from financial institutions	44,413	149,498	619,699	50,608	26,104	26,104	26,104	26,104	11,818	980,451
Bonds	131,954	153,781	250,561	500,000	644,900	500,000	650,000	75,000	88,000	2,994,196
Loans from others	79,114	0	56,117	0	0	0	0	0	0	135,231
Lease liabilities	2,012	1,958	1,933	1,934	1,780	43,544	0	0	0	53,161
Commercial papers	172,455	0	0	0	0	0	0	0	0	172,455
Total	**429,948**	**305,237**	**928,310**	**552,542**	**672,784**	**569,648**	**676,104**	**101,104**	**99,818**	**4,335,494**

TVO Group credit commitment by maturity

31 December 2019

EUR 1,000	2020	2021	2022	2023	2024	2025	2026	2027	2028–	Total
Syndicated revolving credit facility			300,000	1,000,000						1,300,000
Bilateral revolving credit facility										
Bilateral bank loan										
Total			**300,000**	**1,000,000**						**1,300,000**

Both syndicated and bilateral facilities are undrawn.

On 31 December 2019, the Group had undrawn credit facilities amounting to EUR 1,300 million (2018: EUR 1,400 million). In addition, the Group had subordinated shareholder loan (hybrid equity) commitments totaling EUR 250 million (2018: EUR 250 million) and cash and cash equivalents amounting to EUR 238 million (2018: EUR 221 million).

Credit risk

Credit risk arises from the potential failure of a counterparty to meet its contractual payment obligations. Commercial trade receivables as well as receivables from financial institutions relating to investments, deposits and derivative transactions expose the Company to credit risk. In addition to money market funds, financial institutions that meet the credit rating requirements of the Group's Financial Policy are accepted as counterparties. Furthermore, TVO Group has in place a master agreement (ISDA) with all derivative contract counterparties.

Fuel price risk

The main fuels used for electricity production by the Group are uranium and coal.

TVO Group purchases the uranium fuel from the global markets. The purchasing process consists of four stages: purchase of uranium concentrate, conversion, enrichment and fuel fabrication. Purchasing Policy is used to guarantee the availability of fuel and to minimize price risk. This includes storage strategy and diversified long-term purchasing agreements with different suppliers.

TVO Group has not used commodity derivatives to hedge fuel price risk.

Capital risk management

TVO Group's objective is to secure sufficient equity and equity-like funding that guarantees diversified funding sources.

The equity ratio of the Company varies along investment cycles. The Group has targeted a minimum equity ratio (IFRS) of 25 percent in the long-term. When calculating the equity ratio, the loan from the Finnish State Nuclear Waste Management Fund (lent further to the shareholders) and the provision related to nuclear waste management obligation are excluded. Additionally, subordinated loans or equivalent loans from the shareholders are regarded as equity.

According to the terms of some loan agreements, the Company is obliged to offer a repayment of the loan if TVO Group's equity ratio (IFRS) falls below 25 percent. There are no other key ratio-related covenants in the loan contracts.

The equity ratio monitored by TVO Group's management

	2019	2018
Equity ratio, % (IFRS, Group) [1)]	28.8	28.9
Equity ratio, % (Parent company) [2)]	28.2	29.0

[1)] Equity ratio % = 100 × $\dfrac{\text{equity + loans from equity holders of the company}}{\text{balance sheet total - provision related to nuclear waste management - loan from the Finnish State Nuclear Waste Management Fund}}$

[2)] Equity ratio % = 100 × $\dfrac{\text{equity + appropriations + loans from equity holders of the company}}{\text{balance sheet total - loan from the Finnish State Nuclear Waste Management Fund}}$

Net debt reconciliation

EUR 1,000	2019
Cash and cash equivalents	237,832
Non-current interest-bearing liabilities (excluding loan from VYR)	3,899,238
Current interest-bearing liabilities	422,770
Net debt	**4,084,176**

	Liabilities from financing activities			Other assets	
EUR 1,000	Liabilities	Leases	Sub-total	Cash and cash equivalents	Total
Net debt 31 Dec 2018	-4,055,978	-54,033	-4,110,011	221,166	-3,888,845
Recognized on adoption of IFRS 16	0	-762	-762	0	-762
Net debt 1 Jan 2019	**-4,055,978**	**-54,795**	**-4,110,773**	**221,166**	**-3,889,607**
Cash flows	-212,203	2,049	-210,154	16,666	-193,488
Acquisitions - leases	0	-93	-93	0	-93
Other non-cash flow expenses	-988	0	-988	0	-988
Net debt 31 Dec 2019	**-4,269,169**	**-52,839**	**-4,322,008**	**237,832**	**-4,084,176**

28 Events after the balance sheet date

No major events have taken place after the end of the year in review.

Parent company financial statements

Parent company income statement

EUR 1,000	Note	1 Jan–31 Dec 2019	1 Jan–31 Dec 2018
Turnover	2	**250,961**	**345,702**
Work performed for own purpose	3	18,596	14,941
Other income	4	14,957	14,931
Materials and services	5	-79,873	-154,871
Personnel expenses	6	-67,677	-63,300
Depreciation and impairment charges	7	-38,683	-52,651
Other expenses	8	-93,238	-103,399
Operating profit/loss		**5,043**	**1,353**
Financial income and expenses	9	-108	-109
Profit/loss before appropriations and taxes		**4,935**	**1,244**
Appropriations	10	-4,935	-1,244
Profit/loss for the financial year		**0**	**0**

Parent company balance sheet

EUR 1,000	Note		31 Dec 2019		31 Dec 2018
Assets					
Non-current assets					
Intangible assets	11		5,961		11,333
Tangible assets	11		5,515,711		5,281,001
Investments					
Holdings in group companies	12	8		8	
Holdings in joint ventures	12	1,011		1,011	
Other investments	12	600,637	601,656	673,515	674,534
Total non-current assets			**6,123,328**		**5,966,868**
Current assets					
Inventories	13		269,579		260,594
Current receivables	14		93,481		171,227
Cash and cash equivalents			237,298		220,051
Total current assets			**600,358**		**651,872**
Total assets			**6,723,686**		**6,618,740**

EUR 1,000	Note	31 Dec 2019	31 Dec 2018
Equity and liabilities			
Equity			
Share capital	15	600,365	600,365
Share premium reserve	15	232,435	232,435
Statutory reserve	15	9,948	9,948
Reserve for invested non-restricted equity	15	3	3
Retained earnings (loss)	15, 16	14,460	14,460
Profit (loss) for the financial year	15, 16	0	0
Total equity		**857,211**	**857,211**
Appropriations		**192,611**	**187,333**
Liabilities			
Non-current liabilities	17, 18	3,854,397	3,612,905
Shareholders' loans	17	679,300	679,300
Loan from the Finnish State Nuclear Waste Management Fund	17	591,441	666,242
Current liabilities	19	548,726	615,749
Total liabilities		**5,673,864**	**5,574,196**
Total equity and liabilities		**6,723,686**	**6,618,740**

Parent company cash flow statement

EUR 1,000	2019	2018
Operating activities		
Operating profit/loss	5,043	1,353
Adjustments to operating profit /loss [1)]	38,667	52,665
Changes in working capital [2)]	43,144	-7,603
Interest paid and other financial expenses	-3,291	-3,634
Interest received	3,497	3,876
Cash flow from operating activities	**87,060**	**46,657**
Investing activities		
Acquisition of non-current assets	-402,137	-626,625
OL3 EPR project compensation	122,000	328,000
Proceeds from sale of intangible and tangible assets	23	15
Loan receivables granted	-9,098	-10,867
Repayments of loans granted	84,006	240
Cash flow from investing activities	**-205,206**	**-309,237**
Financing activities		
Reduction of share capital	0	-5,825
Withdrawals of long-term loans	943,192	904,993
Repayment of long-term loans	-817,151	-717,926
Increase (-) or decrease (+) in interest-bearing receivables	-2,030	0
Increase (+) or decrease (-) in short-term interest-bearing liabilities	11,039	161,416
Group contribution received	343	353
Cash flow from financing activities	**135,393**	**343,011**
Change in cash and cash equivalents	**17,247**	**80,431**
Cash and cash equivalents 1 Jan	220,051	139,620
Cash and cash equivalents 31 Dec	**237,298**	**220,051**

EUR 1,000	2019	2018
[1)] Adjustments to operating profit/loss		
Depreciation and write-downs	38,683	52,651
Gain (-) or loss (+) from divestment of non-current assets	-16	14
Total	**38,667**	**52,665**
[2)] Changes in working capital		
Increase (-) or decrease (+) in inventories	-8,985	-3,503
Increase (-) or decrease (+) in non-interest-bearing receivables	76,847	-5,870
Increase (+) or decrease (-) in short-term non-interest-bearing liabilities	-24,718	1,770
Total	**43,144**	**-7,603**

Notes to the parent company financial statements

1 Accounting principles

Valuation principles

NON-CURRENT ASSETS AND THEIR DEPRECIATION

Non-current assets have been capitalized at direct acquisition cost including interest costs over the period of construction, less planned depreciation and received allowances. Depreciation according to plan is calculated on a straight-line basis according to the estimated useful economic lives.

The depreciation periods are as follows:

OL1 and OL2 nuclear power plant units:

Basic investment	61 years
Investments made according to the modernization program	19–35 years
Automation investments associated with the modernization	15 years
Additional investments	10 years
Buildings and structures	10–40 years
TVO's share in the Olkiluoto gas turbine power plant	30 years.

VALUATION OF INVENTORIES

Materials and supplies have been valued at direct acquisition cost, coal on the basis of the FIFO principle (first in, first out), nuclear fuel according to calculated fuel consumption, and supply stocks at average acquisition cost. If the replacement value of inventories on 31 December is lower than the original acquisition cost, the difference will not be entered in the books as an expense because the company operates at cost price.

CO_2 EMISSION RIGHTS

Carbon dioxide (CO_2) emission rights are included in the intangible assets. Emission rights are recognized at historical cost. The current liability for returning emission rights is recognized at the carrying value of possessed emission rights. If there is a shortfall, a current liability is recognized to cover the acquisition of the missing emission rights. This current liability is valued at the current market value of the emission rights at the balance sheet date. The cost of the emission rights is recognized in the income statement under costs of materials and services. The gains from the sales of emission rights are refunded to the equity holders of the company.

RESEARCH AND DEVELOPMENT COSTS

Research and development costs associated with production activity are entered as annual costs for the year in which they were incurred.

ITEMS DENOMINATED IN FOREIGN CURRENCY

Transactions in foreign currency have been entered at the relevant exchange rate or at the transaction rate for purchase and sale of foreign currency. On the balance sheet date, exchange rate differences on foreign currency accounts have been entered in the income statement under financial income and expenses.

MONEY MARKET INSTRUMENTS

Money market instruments comprise shares in short-term money market funds and certificate of deposits. They are valued in the balance sheet at their original acquisition cost and are included in financing activities in the cash flow statements.

DERIVATIVE FINANCIAL INSTRUMENTS

The Company applies hedge accounting. Derivative financial instruments have not been entered on the balance sheet. Their nominal values and fair values are presented in the notes to the financial statements.

Interest rate duration of floating rate loans has been managed with interest rate swaps, caps and floors. Interest costs of these instruments have been entered on accrual basis and shown in net amount under financial income and expenses. The premiums on interest rate options have been accrued over the period to maturity.

Payments of foreign currency denominated inventory acquisitions have been hedged with currency derivatives. The realized exchange rate differences of derivative financial instruments have been entered to adjust the acquisition cost of inventories. Cross currency swaps have been used to hedge foreign currency denominated long-term loans.

Items related to nuclear waste management liability

Nuclear waste management obligation is provided for in the Nuclear Energy Act. The obligation covers all future costs from nuclear waste handling including decommissioning of nuclear power plant units, costs for final disposal of spent nuclear fuel and the risk margin, decommissioning being assumed to start at the end of the year in question.

The Ministry of Employment and the Economy confirms annually at the end of the calendar year the liability for nuclear waste management for the current year and the target reserve for the next year.

The company liable for nuclear waste management shall pay its contribution to the Finnish State Nuclear Waste Management Fund so that the company's share in the Fund on 31 March is equal to the company funding obligation target confirmed for the calendar year in question.

The annual contribution to the Finnish State Nuclear Waste Management Fund and costs from nuclear waste management and services are entered as annual expenses. The nuclear waste management fee is based on the Company's proposal. If the nuclear waste management fee set by the Finnish State Nuclear Waste Management Fund differs from the amount proposed by the Company, the difference is entered in the accounts for the following financial year.

Nuclear waste management liability and the TVO's funding target obligation to the Finnish State Nuclear Waste Management Fund are presented in the Notes to the financial statements.

The Company must supply the Ministry with guarantees to cover for the difference between the legal nuclear waste management liability and the Company's share in the Finnish State Nuclear Waste Management Fund as well as for unforeseen expenses in nuclear waste management. Guarantees are presented in the Notes to the financial statements.

A company liable for nuclear waste management or its shareholder is entitled to a loan from the Finnish State Nuclear Waste Management Fund corresponding to 75 percent of the company's share in the Fund. TVO uses the right to borrow funds back and lends them further to its shareholders.

2 Turnover

EUR 1,000	2019	2018
Olkiluoto 1 and Olkiluoto 2	234,950	301,274
Meri-Pori	16,011	44,428
Total	**250,961**	**345,702**
Electricity delivered to equity holders of the company (GWh)		
Olkiluoto 1	7,531	6,742
Olkiluoto 2	7,198	7,321
Total Olkiluoto	14,729	14,063
Meri-Pori	182	660
Total	**14,911**	**14,723**

3 Work performed for own purpose

EUR 1,000	2019	2018
Personnel expenses related to OL3	18,596	14,941

4 Other income

EUR 1,000	2019	2018
Rental income	1,256	1,082
Sales profit of tangible assets and shares	16	2
Sales of services	12,981	12,778
Other income	704	1,069
Total	**14,957**	**14,931**

5 Materials and services

EUR 1,000	2019	2018
Purchases, accrual basis		
Nuclear fuel	68,503	68,783
Coal	4,853	6,346
Materials and supplies	4,750	4,736
Increase (-) or decrease (+) in inventories	-9,332	-4,064
Total	**68,774**	**75,801**
CO_2 emission rights	5,316	8,660
Nuclear waste management		
Contribution to the Finnish State Nuclear Waste Management Fund [1)]	-42,128	25,787
Nuclear waste management services	37,528	32,108
Total	**-4,600**	**57,895**
External services	10,383	12,515
Total	**79,873**	**154,871**

[1)] Based on TVO's proposal. If the contribution confirmed by the Finnish State Nuclear Waste Management Fund for the year differs from the proposal, the difference will be booked in the following financial year.

Consumption		
Nuclear fuel	59,455	57,694
Coal	5,403	14,470
Materials and supplies	3,916	3,637
Total	**68,774**	**75,801**

6 Notes concerning personnel and members of administrative bodies

EUR 1,000	2019	2018
Personnel expenses		
Wages and salaries	56,775	52,461
Pension expenses	9,216	9,148
Other compulsory personnel expenses	1,686	1,691
Total	**67,677**	**63,300**
Salaries and fees paid to management		
President and CEO deputy and members of the Board of Directors	734	850

Average number of personnel

	2019	2018
Office personnel	759	716
Manual workers	183	155
Total	**942**	**871**

Number of employees 31 December

	2019	2018
Office personnel	751	712
Manual workers	190	165
Total	**941**	**877**

7 Depreciation and impairment charges

EUR 1,000	2019	2018
Depreciation according to plan		
Other capitalized long-term expenses	394	1,641
Buildings and construction	3,199	5,876
Machinery and equipment	33,813	42,773
Other tangible assets	1,277	2,361
Total	**38,683**	**52,651**

8 Other expenses

EUR 1,000	2019	2018
Maintenance services	22,493	29,760
Regional maintenance and service	8,479	8,744
Research services	3,597	3,927
Other external services	24,371	28,384
Real estate tax	6,198	6,134
Rents	1,252	946
ICT expenses	5,450	4,090
Personnel related expenses	4,387	4,863
Corporate communication expenses	847	852
Other expenses	16,164	15,699
Total	**93,238**	**103,399**

Auditors’ fees and not audit-related services PricewaterhouseCoopers Oy

EUR 1,000	2019	2018
Audit fees	139	109
Other services	64	86
Total	**203**	**195**

9 Financial income and expenses

EUR 1,000	2019	2018
Interest income on long-term investments		
From joint ventures	0	23
From others	3,004	3,365
Total	**3,004**	**3,388**
Other interest and financial income		
From others	116	80
Total	**116**	**80**
Interest income on long-term investments and other interest and financial income, total	**3,120**	**3,468**
Interest expenses and other financial expenses		
To the Finnish State Nuclear Waste Management Fund	2,987	3,364
To others	104,738	109,695
Capitalized interest costs	-104,497	-109,482
Total	**3,228**	**3,577**
Total financial income (+) and expenses (-)	**-108**	**-109**
Financial income and expenses include exchange rate gains (+) and losses (-) (net)	79	31

10 Appropriations

EUR 1,000	2019	2018
Group contribution	343	670
The difference between depreciation according to plan and tax depreciation, increase (-) or decrease (+)	-5,278	-1,914
Total	**-4,935**	**-1,244**

11 Non-current assets

EUR 1,000	Formation expenses	Intangible rights	Other capitalized long-term expenses	Advance payments	Total
Intangible assets					
Acquisition cost 1 Jan 2019	54,011	8,835	26,076	7	88,929
Increase	0	5,141	54	43	5,238
Decrease	0	-10,216	0	0	-10,216
Acquisition cost 31 Dec 2019	54,011	3,760	26,130	50	83,951
Accumulated depreciation according to plan 1 Jan	54,011	0	23,585	0	77,596
Depreciation according to plan	0	0	394	0	394
Book value 31 Dec 2019	**0**	**3,760**	**2,151**	**50**	**5,961**
Accumulated depreciation difference 1 Jan	0	0	1,337	0	1,337
Change in depreciation difference	0	0	94	0	94
Accumulated depreciation difference 31 Dec	0	0	1,431	0	1,431
Undepreciated acquisition cost in taxation 31 Dec 2019	0	3,760	720	50	4,530

EUR 1,000	Land and water areas	Buildings and construction	Machinery and equipment	Other tangible assets	Construction in progress and advance payments	Total
Tangible assets						
Acquisition cost 1 Jan 2019	12,137	264,856	1,373,546	53,339	4,806,478	6,510,358
Increase	0	873	24,786	41	247,306	273,006
Decrease	-7	-49	-43,985	0	0	-44,041
Transfer between categories	0	1,710	15,354	0	-17,064	0
Acquisition cost 31 Dec 2019	12,130	267,390	1,369,701	53,380	5,036,720	6,739,323
Accumulated depreciation according to plan 1 Jan	0	221,459	962,156	45,742	0	1,229,356
Accumulated depreciation from deduction	0	-49	-43,985	0	0	-44,033
Depreciation according to plan	0	3,199	33,812	1,277	0	38,289
Book value 31 Dec 2019	**12,130**	**42,781**	**417,718**	**6,361**	**5,036,720**	**5,515,711**
Accumulated depreciation difference 1 Jan	0	-7,276	190,600	2,673	0	185,995
Change in depreciation difference	0	914	4,232	37	0	5,184
Accumulated depreciation difference 31 Dec	0	-6,362	194,832	2,710	0	191,180
Undepreciated acquisition cost in taxation 31 Dec 2019	12,130	49,143	222,886	3,651	5,036,720	5,324,530

Share of machinery and equipment from book value 31 Dec 2019			401,658			
Share of machinery and equipment from book value 31 Dec 2018			400,017			

Capitalized borrowing costs included in non-current assets

EUR 1,000	Formation expenses	Other capitalized long-term expenses	Buildings and construction	Machinery and equipment	Other tangible assets	Construction in progress	Total
Interest during construction period							
Acquisition cost 1 Jan 2019	11,046	1,167	27,122	95,394	2,401	1,400,199	1,537,329
Increase	0	0	0	0	0	104,443	104,443
Acquisition cost 31 Dec 2019	11,046	1,167	27,122	95,394	2,401	1,504,642	1,641,772
Accumulated depreciation according to plan 1 Jan	11,046	899	20,884	73,455	1,850	0	108,134
Depreciation according to plan	0	12	283	997	25	0	1,317
Book value 31 Dec 2019	**0**	**256**	**5,955**	**20,942**	**526**	**1,504,642**	**1,532,321**
Accumulated depreciation difference 1 Jan	0	268	6,238	21,939	551	0	28,996
Change in depreciation difference	0	-12	-283	-997	-25	0	-1,317
Accumulated depreciation difference 31 Dec	0	256	5,955	20,942	526	0	27,679
Undepreciated acquisition cost in taxation 31 Dec 2019	0	0	0	0	0	1,504,642	1,504,642

12 Investments

EUR 1,000	Holdings in group companies	Holdings in joint ventures	Other stocks and shares	Loan receivables, joint ventures	Loan receivables, others	Long-term receivables	Total
Acquisition cost 1 Jan 2019	8	1,011	4,218	2,549	666,748	0	674,534
Increase	0	0	0	132	9,205	2,030	11,367
Decrease	0	0	0	-239	-84,006	0	-84,245
Acquisition cost 31 Dec 2019	8	1,011	4,218	2,442	591,947	2,030	601,656
Book value 31 Dec 2019	**8**	**1,011**	**4,218**	**2,442**	**591,947**	2,030	**601,656**
Loan from the Finnish State Nuclear Waste Management Fund lent further to the equity holders of the company					594,441		594,441

Group companies	Group share, %
TVO Nuclear Services Oy, Eurajoki	100

Joint ventures	Holding of the parent company, %
Posiva Oy, Eurajoki, A series	60
Posiva Oy, Eurajoki, B series	74

13 Inventories

EUR 1,000	2019	2018
Coal		
Replacement cost	0	610
Book value	0	550
Difference	**0**	**60**
Raw uranium and natural uranium		
Replacement cost	79,630	80,741
Book value	91,772	81,369
Difference	**-12,142**	**-628**
Coal	0	550
Raw uranium and natural uranium	91,772	81,370
Nuclear fuel	170,083	171,436
Supplies	7,724	7,238
Total	**269,579**	**260,594**

14 Current receivables

EUR 1,000	2019	2018
Receivables from group companies		
Accrued income	1,052	1,741
Total	**1,052**	**1,741**
Receivables from joint ventures		
Trade receivables	0	67
Loan receivables	240	239
Prepayments and accrued income	2,074	1,147
Total	**2,314**	**1,453**
Receivables from others		
Trade receivables	17,467	17,390
Other receivables	984	122,307
Total	**18,451**	**139,697**
Prepayments and accrued income		
Prepaid interests	21,275	21,798
Accrued interest income	2,988	3,364
Other accrued income	44,462	3,135
Other prepaid expenses	2,939	39
Total	**71,664**	**28,336**
Total	**93,481**	**171,227**

15 Equity

EUR 1,000	2019	2018
Share capital 1 Jan 2019	600,365	606,193
Reduction of share capital	0	-5,828
Share capital 31 Dec 2019	600,365	600,365
Share premium reserve 1 Jan 2019	232,435	232,435
Share premium reserve 31 Dec 2019	232,435	232,435
Statutory reserve 1 Jan 2019	9,948	9,948
Statutory reserve 31 Dec 2019	9,948	9,948
Reserve for invested non-restricted equity 1 Jan 2019	3	0
Change	0	3
Reserve for invested non-restricted equity 31 Dec 2019	3	3
Retained earnings/loss 1 Jan 2019	14,460	14,460
Change	0	0
Retained earnings/loss 31 Dec 2019	14,460	14,460
Profit/loss for the financial year	0	0
Total	**857,211**	**857,211**

16 Distributable equity

EUR 1,000	2019	2018
Retained earnings	14,460	14,460
Profit/loss for the financial year	0	0
Total	**14,460**	**14,460**

17 Non-current liabilities

EUR 1,000	2019	2018
Bonds	2,862,242	2,597,223
Loans from financial institutions	931,238	875,652
Other loans	60,917	140,031
Shareholders' loans [1]	679,300	679,300
Loan from the Finnish State Nuclear Waste Management Fund [2]	591,441	666,241
Total	**5,125,138**	**4,958,447**

[1] Subordinated loans.
[2] Lent further to the shareholders.

Bonds

Euro Medium Term Note Programme EUR 4.000.000.000

Currency	Capital 2019	EUR 1,000 2019	Capital 2018	EUR 1,000 2018	Maturity date
EUR	0	0	193,452	193,452	4.2.2019 [1]
EUR	153,781	153,781	500,000	500,000	17.3.2021
EUR	30,000	30,000	30,000	30,000	9.5.2022
EUR	100,000	100,000	100,000	100,000	12.9.2022
EUR	23,000	23,000	23,000	23,000	1.12.2022
EUR	75,000	75,000	75,000	75,000	14.12.2027
EUR	20,000	20,000	20,000	20,000	8.11.2032
EUR	23,000	23,000	23,000	23,000	3.5.2030
EUR	20,000	20,000	20,000	20,000	8.5.2024
EUR	45,000	45,000	45,000	45,000	31.3.2032
EUR	500,000	500,000	500,000	500,000	4.2.2025
EUR	500,000	500,000	500,000	500,000	13.1.2023
EUR	400,000	400,000	400,000	400,000	8.5.2024
EUR	650,000	650,000	0	0	9.3.2026
SEK	0	0	600,000	58,267	30.10.2019 [1]
SEK	650,000	70,945	650,000	70,945	17.3.2020 [1]
SEK	550,000	61,009	550,000	61,009	19.5.2020 [1]
SEK	1,000,000	97,561	1,000,000	97,561	15.2.2022
SEK	500,000	48,781	500,000	48,780	15.2.2024
SEK	850,000	82,927	850,000	82,927	15.2.2024
SEK	500,000	46,624	0	0	29.10.2024
SEK	500,000	46,568	0	0	29.10.2024
Total		**2,994,197**		**2,848,941**	
[1] Current portion of long-term bonds		131,955		251,718	
Total		**2,862,242**		**2,597,223**	

Other loans

US Private Placements

Currency	Capital 2019	EUR 1,000 2019	Capital 2018	EUR 1,000 2018	Maturity date
USD	50,000	39,557	50,000	39,557	26.8.2020 [1]
USD	50,000	39,557	50,000	39,557	26.8.2020 [1]
GBP	50,000	56,116	50,000	56,116	15.11.2022
Total		**135,231**		**135,231**	
[1] Current portion of other loans		79,114		0	
Total		56,117		135,231	
Collateral received		4,800		4,800	
Total		**60,917**		**140,031**	

18 Debts due in more than five years

EUR 1,000	2019	2018
Debts due in more than 5 years	2,082,430	1,953,098

19 Current liabilities

EUR 1,000	2019	2018
Liabilities from joint ventures		
Accruals	3,831	1,974
Total	**3,831**	**1,974**
Liabilities from others		
Advances received	17,788	20,398
Trade payables	7,730	8,257
Total	**25,518**	**28,655**
Interest-bearing liabilities		
Bonds	131,955	251,719
Loans from financial institutions	44,413	44,412
Commercial paper program	172,455	161,416
Private Placements	79,114	0
Total	**427,937**	**457,547**
Accruals and deferred income		
Finnish State Nuclear Waste Management Fund	2,988	26,454
Accrued interests	39,662	47,522
Accrued personnel expenses	18,303	17,595
Accruals related to CO_2 emission rights	3,760	8,834
Other accruals and deferred income	26,727	27,168
Total	**91,440**	**127,573**
Total	**548,726**	**615,749**

20 Commitments

Leasing liabilities

EUR 1,000	2019	2018
Leasing liabilities falling due in less than a year	2,612	2,433
Leasing liabilities falling due later	51,238	53,120
Total	**53,850**	**55,553**

TVO has the right to redeem the lease object for EUR 42.7 million in 2025.

Contingent liabilities given on own behalf

EUR 1,000	2019	2018
Bank guarantees	7,000	7,000

Nuclear waste management

EUR 1,000	2019	2018
Liability for nuclear waste management according to the Nuclear Energy Act [1)]	1,471,400	1,505,800
TVO's funding target obligation 2020 (2019) to the Finnish State Nuclear Waste Management Fund	1,471,400	1,505,800
Collateral for nuclear waste management contingencies	77,980	135,970
Nuclear waste management loan receivables pledged to the Finnish State Nuclear Waste Management Fund	591,441	666,242

[1)] Based on the nuclear waste management program and proposal for the liability made by the Company and which is to be confirmed by the Ministry of Employment and the Economy at the end of the year.

Pending Court Cases and Disputes

See note 25 Obligations and other commitments in the consolidated financial statements.

21 Derivative financial instruments

EUR 1,000	2019	2018
Interest rate derivatives		
Interest rate swaps (nominal value)	1,996,071	2,196,071
Fair value	-14,100	-2,288
Forward foreign exchange contracts		
Forward foreign exchange contracts (nominal value)	109,217	121,628
Fair value	17,318	15,344
Cross-currency swaps		
Cross-currency swaps (nominal value)	589,613	554,697
Fair value	-6,289	6,775

Risk management principles, principles for the recognition of derivatives as well as details of derivatives are described in the Notes to the IFRS consolidated financial statements. Hedging relationships are effective, i.e. the hedged risk and hedging instrument will perfectly match with each other. In documents regarding these hedging relationships, the hedged risks and hedging instruments are extensively described and the effectiveness between them is demonstrated.

22 Series of shares

Share capital and series of shares

	Number 2019	Number 2018	EUR 1,000 2019	EUR 1,000 2018
A-series - OL1 and OL2				
1 Jan	680,000,000	680,000,000	115,600	115,600
Change	0	0	0	0
31 Dec	680,000,000	680,000,000	115,600	115,600
B-series - OL3				
1 Jan	680,000,000	680,000,000	484,765	484,765
Change	0	0	0	0
31 Dec	680,000,000	680,000,000	484,765	484,765
C-series - TVO's share in the Meri-Pori coal-fired power plant				
1 Jan	34,283,730	34,283,730	0	5,828
Change	0	0	0	-5,828
31 Dec	34,283,730	34,283,730	0	0
Total	**1,394,283,730**	**1,394,283,730**	**600,365**	**600,365**

According to the Articles of Association, TVO delivers electricity to its shareholders on the so-called Mankala principle, i.e., it delivers the electricity produced or procured to its shareholders in proportion to their shareholding in each series. Each of the shareholders of each series is liable for the variable and fixed annual costs that are specified in detail in the Articles of Association. The Company prepares annually a balance sheet divided into series of shares. The balance sheet, which will be presented to the Shareholders' Meeting, specifies the assets, liabilities and equity of the different series of shares.

23 CO_2 emission rights

In principle TVO has, on 31 December, emission rights of at least the same amount as the actual annual emissions. If the actual emissions exceed the amount of the emission rights that company possesses, the company has booked the expense for exceeding emission rights at the market value on 31 December.

	2019 t CO_2	2019 EUR 1,000	2018 t CO_2	2018 EUR 1,000
Total annual emissions from production facilities	161,924		525,815	
Possessed emission rights	162,546		531,792	
Emission rights bought [1)]	214,200	5,142	530,000	8,835

TVO is responsible for the amount of emission rights corresponding to its share of the production of the plant.

[1)] The purchases of the emission rights are included in materials and services. The emission rights that the company possesses on 31 December are included in intangible rights on the balance sheet and emission rights.

Proposals to the Annual General Meeting

Teollisuuden Voima Oyj's distributable equity as of December 31, 2019 amounted to EUR 14,460,000. The Board of Directors proposes to the Annual General Meeting that no dividend shall be paid.

SIGNATURES FOR THE REPORT OF THE BOARD OF DIRECTORS AND FINANCIAL STATEMENTS

Helsinki, February 26, 2020

Ilkka Tykkyläinen

Tiina Tuomela

Risto Andsten

Esa Kaikkonen

Tapio Korpeinen

Pekka Manninen

Markus Mannström

Markus Rauramo

Anders Renvall

Rami Vuola

Jarmo Tanhua
President and CEO

THE AUDITOR'S NOTE

Our auditor's report has been issued today.

Helsinki, February 26, 2020

PricewaterhouseCoopers Oy
Authorised Public Accountants

Jouko Malinen
Authorised Public Accountant

Auditor’s Report *(Translation of the Finnish Original)*

To the Annual General Meeting of Teollisuuden Voima Oyj

Report on the Audit of the Financial Statements

Opinion

In our opinion

- the consolidated financial statements give a true and fair view of the group’s financial position and financial performance and cash flows in accordance with International Financial Reporting Standards (IFRS) as adopted by the EU
- the financial statements give a true and fair view of the parent company’s financial performance and financial position in accordance with the laws and regulations governing the preparation of the financial statements in Finland and comply with statutory requirements.

Our opinion is consistent with the additional report to the Audit Committee.

What we have audited

We have audited the financial statements of Teollisuuden Voima Oyj (business identity code 0196656-0) for the year ended 31 December 2019. The financial statements comprise:

- the consolidated balance sheet, income statement, statement of comprehensive income, statement of changes in equity, statement of cash flows and notes, including a summary of significant accounting policies
- the parent company’s balance sheet, income statement, statement of cash flows and notes.

Basis for Opinion

We conducted our audit in accordance with good auditing practice in Finland. Our responsibilities under good auditing practice are further described in the Auditor’s Responsibilities for the Audit of the Financial Statements section of our report.

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

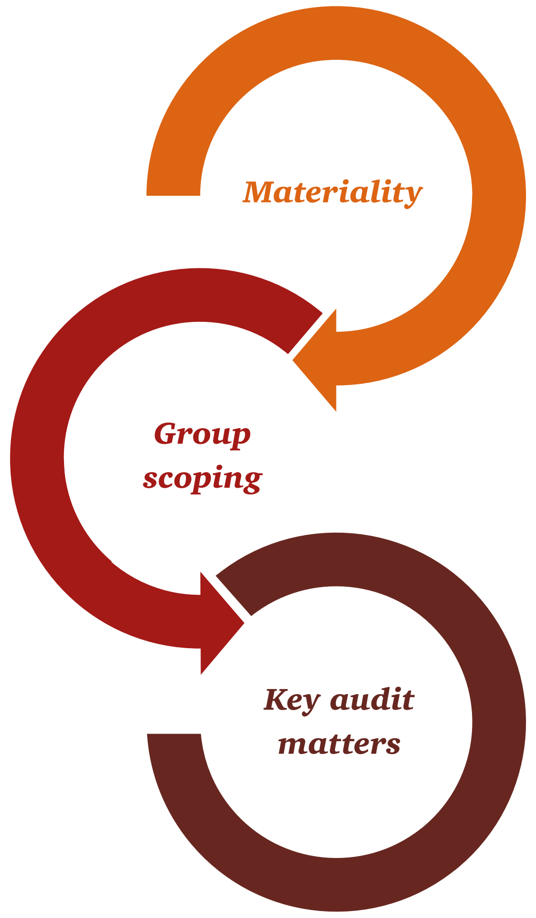
Independence

We are independent of the parent company and of the group companies in accordance with the ethical requirements that are applicable in Finland and are relevant to our audit, and we have fulfilled our other ethical responsibilities in accordance with these requirements.

To the best of our knowledge and belief, the non-audit services that we have provided to the parent company and to the group companies are in accordance with the applicable law and regulations in Finland and we have not provided non-audit services that are prohibited under Article 5(1) of Regulation (EU) No 537/2014. The non-audit services that we have provided are disclosed in note 9 to the Financial Statements.

Our Audit Approach

Overview



Overall group materiality
- € 25 million, which represents approximately 0,3 % of balance sheet total (2018: € 25 million)

Group audit scope
- We audited the consolidated financial statements and the financial statements of the parent company Teollisuuden Voima Oyj.

Key audit matters
- Olkiluoto 3 power plant construction in progress
- Assets and provisions related to the nuclear waste management obligation

As part of designing our audit, we determined materiality and assessed the risks of material misstatement in the financial statements. In particular, we considered where management made subjective judgements; for example, in respect of significant accounting estimates that involved making assumptions and considering future events that are inherently uncertain.

Materiality
The scope of our audit was influenced by our application of materiality. An audit is designed to obtain reasonable assurance whether the financial statements are free from material misstatement. Misstatements may arise due to fraud or error. They are considered material if individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

Based on our professional judgement, we determined certain quantitative thresholds for materiality, including the overall group materiality for the consolidated financial statements as set out in the table below. These, together with qualitative considerations, helped us to determine the scope of our audit and the nature, timing and extent of our audit procedures and to evaluate the effect of misstatements on the financial statements as a whole.

Overall group materiality	€ 25 million (2018: € 25 million)
How we determined it	0,3 % of balance sheet total
Rationale for the materiality benchmark applied	We chose balance sheet total as the benchmark because the company's operations are very capital intensive and because, in our view, this is the benchmark against which the performance of the Group is commonly measured by users.

How we tailored our group audit scope
We tailored the scope of our audit, taking into account the structure of the group, the accounting processes and controls, and the industry in which the group operates.

Group audit scope: We audited the consolidated financial statements and the financial statements of the parent company Teollisuuden Voima Oyj.

Key Audit Matters
Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements of the current period. These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

As in all of our audits, we also addressed the risk of management override of internal controls, including among other matters consideration of whether there was evidence of bias that represented a risk of material misstatement due to fraud.

Key audit matter in the audit of the group	How our audit addressed the key audit matter
Olkiluoto 3 power plant construction in progress	
Refer to the accounting policies note 1 TVO's cost-price principle and note 2 critical accounting estimates and judgements and to the note 12 Property, plant and equipment (Construction in progress and advance payments) and 13 Capitalized borrowing costs included in property, plant and equipment, and intangible assets. OL3 is a power plant in construction, which has been ordered under a turnkey principle. Delivery of the plant has been significantly delayed from the original schedule. During the OL3 project € 5,0 billion have been capitalized in balance sheet item Property, plant and equipment, Construction in progress and advance payments. Under the Articles of Association, each of the shareholders of each series bears their share of the variable and fixed annual costs as specified in detail in the Articles of Association. Our audit focused especially on this item because of the significant monetary amount capitalized in the balance sheet and because completion of the project has been delayed from the original schedule. In addition, a significant amount of financing expenses has been capitalised on this item.	We reviewed company management measures, records and other documentation regarding monitoring of progress of the project. In addition, we tested the internal controls of the company relating to approval, monitoring and reporting of expenses capitalized on the OL3 project. We tested purchase invoices and company's own expenses relating to the project to ascertain the costs capitalised against the power plant construction in progress meet the recognition criteria. During our audit we reviewed whether the borrowing costs were capitalised in accordance with the accounting principles applied, and whether recognition to the project was performed consistently under the same principles as in previous financial statements. In our audit of the amount capitalised in the balance sheet we considered the provisions regarding shareholder responsibilities incorporated in the Articles of Association.

Key audit matter in the audit of the group	How our audit addressed the key audit matter
Assets and provisions related to the nuclear waste management obligation	
Refer to the accounting policies note 2 "Assets and provisions related to the nuclear waste management obligation" and "Critical accounting estimates and judgements'. Note 12 Property, plant and equipment, Decommissioning and note 24 Assets and provisions related to the nuclear waste management obligation. The nuclear waste management obligation totalling € 1,0 billion is shown as a provision under non-current liabilities. The fair value of the nuclear waste management provision has been determined by discounting the future cash flows, which are based on plans about future activity and the estimated expenditure relating to it, taking into account actions already taken. The present initial value of the provision for the decommissioning of a nuclear power plant (at the time of commissioning the nuclear power plant) has been capitalised as property, plant and equipment and will be adjusted later for possible changes in the plan. The amount recognised relating to decommissioning will be depreciated over the estimated operating time of the nuclear power plant. The provision for spent fuel covers the future disposal costs of fuel used by the end of each accounting period. The costs for the disposal are expensed during the operating time of the plant, based on fuel usage. The impact of any changes to the plan will be recognised immediately in the income statement based on fuel used by the end of each accounting period. The assets and provisions related to the nuclear waste management obligation involve inherent judgement, since the estimates made extend far into the future, and subsequently these items on the income statement and balance sheet were subject to special scrutiny.	We assessed the company's accounting policies for compliance with the applicable accounting standards. We reviewed cash flow forecasts and related documentation and interviewed preparers of these calculations to assess foundations of the estimates and assumptions used, and whether the cash flow forecasts are prepared consistently based on the best knowledge available at the time. The most significant estimates relate to the amount and time of realization of the future costs. We also examined whether changes to the cash flow estimates are appropriately documented and approved by the management. We tested whether the calculations are technically prepared under the same principles from one accounting period to another. We tested the mathematical accuracy of the calculations prepared by management. We assessed whether the discount rate and inflation ratio used in the calculation are appropriately determined, and whether the criteria for the used interest rate and inflation ratio are appropriately documented and approved. We also assessed the adequacy of the accounting policies and disclosures presented on the financial statements.

We have no key audit matters to report with respect to our audit of the parent company financial statements.

There are no significant risks of material misstatement referred to in Article 10(2c) of Regulation (EU) No 537/2014 with respect to the consolidated financial statements or the parent company financial statements.

Responsibilities of the Board of Directors and the Managing Director for the Financial Statements

The Board of Directors and the Managing Director are responsible for the preparation of consolidated financial statements that give a true and fair view in accordance with International Financial Reporting Standards (IFRS) as adopted by the EU, and of financial statements that give a true and fair view in accordance with the laws and regulations governing the preparation of financial statements in Finland and comply with statutory requirements. The Board of Directors and the Managing Director are also responsible for such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board of Directors and the Managing Director are responsible for assessing the parent company's and the group's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting. The financial statements are prepared using the going concern basis of accounting unless there is an intention to liquidate the parent company or the group or to cease operations, or there is no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with good auditing practice will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with good auditing practice, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the parent company's or the group's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of the Board of Directors' and the Managing Director's use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the parent company's or the group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the parent company or the group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events so that the financial statements give a true and fair view.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

Other Reporting Requirements

Appointment

Teollisuuden Voima Oyj became a public interest entity in June 2009. We have been the auditors of Teollisuuden Voima Oyj all that time it has been a public interest entity.

Other Information

The Board of Directors and the Managing Director are responsible for the other information. The other information comprises the report of the Board of Directors and the information included in the Annual Report, but does not include the financial statements and our auditor's report thereon. We have obtained the report of the Board of Directors and Annual Report prior to the date of this auditor's report.

Our opinion on the financial statements does not cover the other information.

In connection with our audit of the financial statements, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. With respect to the report of the Board of Directors, our responsibility also includes considering whether the report of the Board of Directors has been prepared in accordance with the applicable laws and regulations.

In our opinion

- the information in the report of the Board of Directors is consistent with the information in the financial statements
- the report of the Board of Directors has been prepared in accordance with the applicable laws and regulations.

If, based on the work we have performed on the other information that we obtained prior to the date of this auditor's report, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Other statements

We support that the financial statements of the parent company and the consolidated financial statements should be adopted. The proposal by the Board of Directors regarding the result of the accounting period is in compliance with the Companies Act. We support that the members of the Board of Directors and the Managing Director of the parent company should be discharged from liability for the period audited by us.

Helsinki 26 February 2020

PricewaterhouseCoopers Oy
Authorised Public Accountants

Jouko Malinen
Authorised Public Accountant (KHT)

Financial information in 2020

In 2020, Teollisuuden Voima Oyj will publish the interim reports as follows:

INTERIM REPORT FOR JANUARY-MARCH 2020
on April 20, 2020

INTERIM REPORT FOR JANUARY-JUNE 2020
on July 16, 2020

INTERIM REPORT FOR JANUARY-SEPTEMBER 2020
on October 16, 2020

The interim reports are published at approximately 16:00 EET in Finnish and English, and are available on TVO's website.