REPORT OF THE BOARD OF DIRECTORS AND FINANCIAL STATEMENTS 2018

tvo RELIABLE GREEN ENERGY

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Main events in 2018

The role of low-carbon energy, such as renewable energy and nuclear power, is crucial in the mitigation of climate change. According to the report published by Intergovernmental Panel for Climate Change (IPCC) in October 2018 nuclear energy has a pivotal role in prevention of climate change. 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 2018, the share of nuclear power was about 33 percent of all electricity produced in Finland.

The electricity generation at Teollisuuden Voima Oyj's (TVO) Olkiluoto nuclear power plant in 2018 totaled 14,1 terawatt hours (billion kilowatt hours), which accounted for about 16 percent of all electricity consumed and about 21 percent of all electricity produced in Finland. The combined load factor of the plant units was 91.1 percent. Together with the share of the Meri-Pori coal-fired power plant TVO's production totaled 14.7 (13.5) TWh, which accounted for about 17 percent of all electricity consumed and about 22 percent of all electricity produced in Finland. The Group's turnover was EUR 350.3 (320.9) million.

Olkiluoto 1 and 2 plant units are in safe and good production condition. The largest modernization work in TVO's history was conducted at the plant, and the Company's safety culture – the base of all operations – was further developed. 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. The annual outages of 2018 at the Olkiluoto nuclear power plant were carried out from April 22 to June 23, 2018. Olkiluoto 2 (OL2) had a refueling outage taking more than 13 days. Olkiluoto 1 (OL1) underwent a major maintenance outage that included replacement of the main internal pumps and their frequency converters, renewal of turbine condensers, installation of a new alternative coolant injection system, high-pressure drain forward pumping, and replacement of the high-pressure preheaters and feedwater distributors. A containment leak-tightness test was also carried out. The outage of OL1 unit took approximately 41 days. As a result of the modifications carried out, the nominal output of OL1 was increased at the turn of the year from 880 megawatts to 890 megawatts.

In January 2017, TVO submitted to the Ministry of Economic Affairs and Employment an application for a new operating licence for the Olkiluoto 1 and 2 plant units and the Government granted the licence for the next 20 years on 20 September 2018.

A comprehensive settlement agreement on Olkiluoto 3 EPR (OL3 EPR) project was signed between TVO and the plant supplier consortium companies on March 2018. The agreement entered into force in the same month. The settlement agreed on delayed completion of OL3 EPR project, costs of delay and confirmation of completion of the project.

Preparing the Olkiluoto 3 EPR plant unit for production proceeded in 2018. Training of the operating personnel has progressed and first operators were licenced by the Radiation and Nuclear Safety Authority in December 2018. The hot functional tests (HFT) of the plant unit were completed in May 2018. During HFT, the reactor and turbine units were co-operated as one entity for the first time.

According to the schedule updated by the Plant Supplier in November 2018, regular electricity production at the OL3 EPR plant unit will commence in January 2020. According to the Supplier, nuclear fuel will be loaded into the reactor in June 2019 and the plant unit will be connected to the grid for the first time in October 2019.

The excavation work of Posiva's final disposal facility for spent nuclear fuel at Olkiluoto have progressed according to plan. Posiva commenced full-scale in-situ system test (FISST) in its final disposal demonstration facilities in June 2018. The objective of the FISST is to demonstrate that safe final disposal concept of spent nuclear fuel can be implemented as designed by Posiva. Excavation of the vehicle access tunnels leading to the final disposal facility, technical rooms and excavation of the central tunnel for the integrated systems test have been completed.

At the end of the year, the total number of personnel in the Group was 878 (807). The number of personnel working for Posiva and its subsidiary Posiva Solutions Oy was 85 (80). Past year was the largest recruitment year in the history of the TVO Group: a total of 134 new staff members were recruited during 2018.

Operating environment

The total electricity consumption in Finland in 2018 was 87 terawatt hours (TWh). The consumption increased by two percent compared to the previous year. The share of net electricity imports was 23 percent (23.9 TWh) of the total consumption. The amount of nuclear power generated in 2018 was 22 TWh, which accounted for 25 percent of the electricity procured.

In January 2018, the Ministry of Finance requested an opinion on a draft bill aimed at amending the provision in the legislation on taxation of business income, which limits the right to deduct interest. TVO proposed amendments to the draft bill to avoid additional burden to the energy sector. Parliament enacted the first part of the draft bill in November 2018, but preparation of the second part still continues. First amendments entered into force on 1 January 2019. Parliament pointed out in its statement that in the next phases of legislative preparation process the possibility of excluding Mankala companies from the limited right to deduct interest must be resolved.

Preparation of the “Clean Energy for all Europeans” package published by the European Commission in November 2016 continues in respect of electricity market model. Energy efficiency directive, renewable energy directive and the legislative proposals on regulation of Energy Union were enacted in December 2018.

The Commission published a new climate strategy that reaches to the year 2050 aiming to a carbon neutral society. The strategy will direct EU’s climate and energy policy during the term of the next Commission. In the strategy, nuclear energy is considered a pivotal part of European energy system beside renewable energy sources.

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 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 “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 are owned also by 132 Finnish municipalities. TVO generates about 17 percent of all electricity consumed by Finns.

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 (Chapter 16) Responsibility).

The objectives of TVO's strategy include predictable and competitive price of electricity, 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 nuclear power lifecycle.

Financial performance

The group's consolidated turnover for 2018 was EUR 350.3 (320.9) million. The amount of electricity delivered to the shareholders was 14,723 (13,516) GWh. The higher delivery volume of electricity to shareholders was due to higher production levels in both Olkiluoto plant units and Meri-Pori coal-fired plant compared to the previous year.

The consolidated profit/loss was EUR -18.2 (-9.4) million.

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 4,749.8 (December 31, 2017: 4,412.0) million, of which EUR 679.3 (579.3) million were subordinated shareholder loans. During 2018, TVO raised a total of EUR 894.3 (200.0) million in non-current liabilities, of which EUR 100.0 (100.0) million were subordinated shareholder loans. Repayments during the year amounted to EUR 717.9 (258.9) million.

In April TVO issued a EUR 400.0 million bond. The maturity of the bond is six years and the coupon 2 %. EUR 306.5 million of the proceeds from the bond were used for a partial repurchase of the EUR 500.0 million bond maturing in February 2019.

In September TVO raised EUR 100.0 million of subordinated shareholder loans. Thereafter, shareholder loan commitments worth EUR 250.0 million are still undrawn.

In November TVO issued a SEK 2,350 million bond equivalent to EUR 229 million. There are two maturities in the bond. 3.25 years for SEK 1,000 million and 5.25 years for SEK 1,350 million.

In December, the company made a bilateral loan of EUR 65 million with Nordic Investment Bank (NIB). Maturity of the loan is ten years. In addition, TVO made a bilateral loan agreement of EUR 100 million for three years in December.

In February, Japan Credit Rating Agency (JCR) downgraded TVO's long term rating from AA- to A+ and assessed the outlook as stable. Standard & Poor's (S&P) had set TVO's long term rating (BB+) under CreditWatch Negative in October 2017.

However, in March 2018, S&P removed TVO's rating from CreditWatch Negative and assessed TVO's outlook as stable. In September 2018 Fitch Rating Agency confirmed TVO's long term rating BBB- and assessed outlook as stable. In December JCR confirmed TVO's long term rating A+ and assessed outlook as stable.

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

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, 2018 the amount of the loan was EUR 666.2 (655.5) million and it has been relent to the Company's A-series shareholders. On March 31, 2018, the loan from the Finnish State Nuclear Waste Management Fund was increased by EUR 10.7 (March 31, 2017: decrease 371.5) million.

Share capital

TVO's share capital on December 31, 2018 was EUR 600.4 (606.2) 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 right to acquire electricity generated by TVO's share of the Meri-Pori coal-fired power plant.

At TVO's Extraordinary General Meeting (EGM) 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 is registered in October 2018. The other amendments to the Articles of Association will be registered when the cancellation of class C shares is registered.

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 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, http://vuosikertomus.tvo.fi/annualreport2018, at the same time with this Report of the Board of Directors.

Administrative bodies

TVO's administrative bodies and their operations in 2018 have been described in a separate Corporate Governance Statement to be found on the Company's website: http://vuosikertomus.tvo.fi/annualreport2018.

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, 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 National Nuclear Waste Management Fund and to execute the possible amendments. The term of the working group lasts until June 2019.

In November 2018 MEAE submitted a draft proposal on amending the laws on nuclear energy and security clearance. The pivotal objective of the proposal is to enhance nuclear and radiation safety by developing regulations on security arrangements. Proposal is planned to enter into force on 1 January 2020.

New radiation law (859/2018) entered into force in December 2018. Changes were also made to nuclear energy law at the same time. Nuclear Safety and Radiation Authority's amendments on Regulation on the Safety of a Nuclear Power Plant (STUK/Y/1), Regulation on the Emergency Arrangements of a Nuclear Power Plant (STUK/Y/2), Regulation on the Safety of Disposal of Nuclear Waste (STUK/Y/4) and regulation on Exemption Values and Clearance Levels (SY/1/2018) also came into force in December 2018.

Radiation and Nuclear Safety Authority's Regulatory Guides on nuclear safety (YVL Guides) currently in force were enforced in OL1 and OL2during 2015. YVL Guides will be enforced at the Olkiluoto 3 EPR plant unit primarily after the operating license for the plant unit has been granted. YVL Guides have been updated in 2018 and the amendments are in consultation process at the moment. They are planned to enter into force in 2019.

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 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.

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 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 maintain. 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 that also verifies the Company's principles of risk management. 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 and the Board of Directors in accordance with the annual schedule of management.

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 2018, 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 2018 as part of investment process.

Major risks and uncertainties

The risks connected 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 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 and 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 Supplier in November 2018, regular electricity production in the unit will commence in January 2020.

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 2018, several risk management measures related to the OL3 EPR project have been executed to improve TVO's readiness to commission the OL3 EPR unit as well as operate three nuclear power plant units. The settlement agreement that entered into force in March 2018 was one of the most important risk management actions. TVO monitors closely the compliance of the conditions set in the settlement agreement and that the commissioning of OL3 EPR plant unit is executed according the schedule provided by the Supplier.

Profit-yielding capacity of OL3

If the OL3 EPR project fails to reach the projected output level, load factor or operating cost structure or 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 plant are fully 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 vitally 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 2018 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 and for future retirements by recruiting 134 new staff members in 2018 and by maintaining comprehensive supplier chain. Furthermore, TVO has also executed a competence survey project, the results of which are used for personnel planning. OL3 EPR trainings and the qualification of licensed personnel have progressed during 2018 and the first operator licences were granted by the Radiation and Nuclear Safety Authority in December 2018. 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 in 2018 the results were showing remarkable improvement in every section.

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. 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 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 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.

TVO’s shareholders, banks and investors have a solid trust in the Company’s operations. 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 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 2018 and the most significant industrialization measures related to final disposal were defined.

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, respect of human rights and risks related to corruption and bribery constitute one area of the Company’s risk assessment. No significant risks affecting the Company’s operations have detected on forementioned matters. The possible risks detected on these areas are addressed according 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 Chapter 16) Responsibility.

Pending court cases and disputes

There were no pending court cases or disputes in the end of period under review.

According to the comprehensive settlement agreement signed in March 2018, TVO and the Supplier jointly withdrew the pending arbitration proceedings under the International Chamber of Commerce (ICC) rules with respect to costs and losses incurred in relation to delays in the construction of the OL3 EPR project. In June 2018, the ICC tribunal confirmed the arbitration settlement by a consent award, and the arbitration proceedings were terminated. The parties also withdrew the pending appeals in the General Court of the European Union.

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.

The settlement agreement stipulates that:

In order to provide and maintain adequate and competent technical and human resources for the completion of the OL3 EPR project, Areva will source the necessary additional resources from Framatome S.A.S., whose majority owner is Electricité de France (EDF).

The supplier consortium companies undertake that the funds dedicated to the completion of the OL3 EPR project will be adequate and will cover all applicable guarantee periods, including setting up a trust mechanism funded by Areva companies to secure the financing of the costs of completion of the OL3 EPR project.

The turnkey principle of the OL3 EPR plant contract and the joint and several liability of the supplier consortium companies remain in full force.

The agreement also noted the plant supplier's schedule at the time the agreement was signed, according to which the regular electricity production in the unit would have commenced in May 2019.

The ICC arbitration concerning the costs and losses caused by the delay of the OL3 EPR project was settled by financial compensation of EUR 450 million to be paid to TVO in two installments by the supplier consortium companies. TVO received the first payment of EUR 328 million as the settlement agreement came into force in March 2018. The second payment of EUR 122 million is payable upon completion of the OL3 EPR project or, in any event, on December 31, 2019 at the latest.

The parties withdraw all on-going legal actions related to OL3 EPR, including the ICC arbitration and appeals in the General Court of the European Union.

The supplier consortium companies were entitled to receive an incentive payment, in a maximum amount of EUR 150 million, upon timely completion of the OL3 EPR project set in the settlement agreement. In the event that the supplier consortium companies fail to complete the OL3 EPR project by the end of 2019, they will pay a penalty to TVO for such delay in an amount which will depend on the actual time of completion of the OL3 EPR project and may not exceed EUR 400 million.

In the first quarter of 2018, TVO made a provision of EUR 150 million reflecting the maximum amount of the incentive payment payable to the supplier consortium companies for timely completion of the OL3 EPR project as agreed in the settlement agreement. In June 2018, TVO received from Areva–Siemens Consortium an updated schedule for the commissioning of the OL3 plant unit. According to the received information, the regular electricity generation at OL3 would have started in September 2019, so, in the second quarter of 2018, the provision was withdrawn by EUR 50 million.

In November 2018, TVO received from Areva–Siemens Consortium an updated schedule for the commissioning of the OL3 plant unit. According to the received information, the regular electricity generation at OL3 will start in January 2020. The new schedule caused total withdrawal of the provision, EUR 100 million, in the last quarter of 2018. These settlement payments to TVO and any penalty payable to TVO due to any additional project delay have been taken into account in calculating the final cost of the OL3 EPR project. Based upon the latest schedule offered by the Consortium, the cost estimation of TVO and settlement agreement, TVO estimates that overall cost of the OL3 EPR project will be approximately EUR 5.5 billion in total. The amount corresponding to the settlement amount have been entered as property, plant and equipment in the Group balance sheet.

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 2018 was 14,089 (13,415) GWh. The total load factor was 91.1 (87.2) %.

The plant units operated safely. OL1's net production was 6,755 (7,158) GWh and load factor 87.8 (93.1) %. OL2's net production was 7,334 (6,256) GWh and load factor 94.3 (81.3) %.

The production of the OL2 plant unit was the third best result ever in the history of the unit. The production volume and load factor of OL1 did not rise as high as in the previous years due to some major modification and repair works carried out during the annual outage. Thanks to the modifications the nominal output of OL1 was increased from 880 megawatts to 890 megawatts at the turn of the year.

The Finnish Government approved the extension of operating licences for OL1 and OL2 plant units to be continued up till the year 2038. The Government decision was preceded by the statement of the Radiation and Nuclear Safety Authority (STUK) issued in May. According to STUK, the operation carried out by TVO is safe and in conformity 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 2018 annual outages of the Olkiluoto nuclear power plant were started on April 22 with a refueling outage at OL2. In addition to refueling, the OL2 outage also included annually recurring maintenance work as well as completion of the installation of a new alternative coolant injection system. The outage lasted more than 13 days.

At OL1, the annual outage commenced on May 13 and was completed on June 23. The most important work of the outage at the plant unit included replacement of the reactor’s main internal pumps and their frequency converters, renewal of turbine condensers, installation of a new alternative coolant injection system, high-pressure drain forward pumping, and replacement of the high-pressure preheaters and feedwater distributors. A containment leak-tightness test was also carried out.

In addition to TVO’s own personnel, up to 1,400 contractor employees took part in the 2018 annual outage works.

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.

Olkiluoto 3 EPR

Olkiluoto 3 EPR (OL3 EPR), currently under construction, was procured as a fixed-price turnkey project from a consortium (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 accordance with the Supplier's schedule updated in November 2018, regular electricity generation at the plant unit will commence in January 2020. According to the Supplier, nuclear fuel will be loaded into the reactor in June 2019 and the first connection to the grid takes place in October 2019. According to the Supplier's plant ramp-up program the unit will produce 2–4 TWh of electricity, at varying power levels, during the period of time between the first connection to the grid and the start 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. Training of the operating personnel has progressed and first operator licences were granted by Radiation and Nuclear Safety Authority (STUK) in December 2018. The hot functional testing (HFT) was completed in May 2018. In HFT, the nuclear and turbine island operated for the first time together as an entity without nuclear fuel. During HFT, it was noticed that the pressurizer surge line vibrates. Vibrations will be eliminated by modifying surge line's supporting structures.

On 25 February 2019 Radiation and Nuclear Safety Authority (STUK) gave its statement on operating licence application of Olkiluoto 3 EPR plant unit. STUK does not see any obstacles to grant the licence as applied until the end of 2038. STUK has reviewed, accordingly with the Nuclear Energy Act, OL3 EPR plant unit's safety, and also operation of the TVO Group as entity, such as resources, know-how and nuclear waste management. The Finnish Government makes the decision on the operating licence.

The workforce at the site at the end of the period under review was about 1,500 persons. Occupational safety at the site remained at a good level.

The business restructuring plan announced by Areva in 2016 was implemented at the beginning of 2018. The majority of Areva NP's business was transferred to a company named Framatome, of which 75.5 percent is owned by Electricité de France (EDF). The OL3 EPR project and the means required to complete the project, as well as certain other liabilities remained within Areva NP and Areva GmbH.

A comprehensive settlement agreement between TVO and the OL3 EPR plant supplier consortium companies was signed and it came into force in March 2018. The settlement agreement concerns the completion of the OL3 EPR project and related disputes. More information on the settlement agreement is available in the chapter 11) Pending court cases and disputes.

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 2018, the nuclear fuel purchases amounted to EUR 68.8 (64.6) million and the amount consumed to EUR 57.7 (53.9) million.

The nuclear fuel and uranium stock carrying value on December 31, 2018 was EUR 252.8 (241.7) 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 952.0 (953.1) 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 2018, MEAE set TVO's liability for nuclear waste management at EUR 1,505.8 (1,481.6) million to the end of 2018 and the Company's funding target for 2019 at EUR 1,505.8 (1,470.8) million.

In March 2018, the Finnish State Nuclear Management Fund confirmed TVO's nuclear waste management fee for 2017 at EUR 33.6 (49.1) million, which was paid into the Fund on March 31, 2018 (March 31, 2017). The nuclear waste management fee for 2018 will be confirmed in March 2019.

A total of 8,214 (7,428) m³ of low- and medium-level radioactive waste has accumulated from the OL1 and OL2 plant units during their operation. During 2018, the amount of waste increased by approximately 786 m3. 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 1,531 (1,498) tons, of which 33 (33) tons accumulated in 2018. 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 in charge of executing in Olkiluoto the final disposal of the spent nuclear fuel generated by its owners, TVO at its power plant in Olkiluoto and Fortum at its power plant in Loviisa.

Excavation of the vehicle access tunnels leading to the final disposal facility, technical rooms and excavation of the central tunnel for the integrated systems test have been completed in 2018. The full-scale in-situ system test (FISST) was commenced in ONKALO at the end of June and the backfilling is already completed. The aim of the FISST is to demonstrate that safe final disposal concept can be implemented as designed by Posiva. The test is monitored for several years.

The Radiation and Nuclear Safety Authority has surveyed and approved the excavation works of the main encapsulation building. The contractor for the encapsulation building has been selected and planning preparations for the executive phase is commenced. The second phase of the HVAC works in the ventilation building is completed and installation of electrical and automation systems is in progress. Preparations of strengthening of personnel shaft are ongoing. Raise boring of the canister shaft has been started.

Suppliers of the main encapsulation building equipment have been selected, and the design phase of the main equipment has progressed according to plan. In addition, the decision to construct the encapsulation building is under preparation.

Production processes, subcontracting chain and cost estimates of Posiva have been specified. Based on these elaborations Posiva has decided to implement industrialization procedures that aim to simplify both the processes and the manufacturing of components.

At the end of March, Posiva’s owners submitted the Nuclear Waste Management Annual Report for 2017 to the MEAE. In addition, Posiva’s owners have submitted every three years planned Nuclear Waste Management program to the MEAE in September 2018.

Concept and cost optimization phase of Posiva’s final disposal project has been continued in 2018.

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. The Meri-Pori power plant is located on the Tahkoluoto Island in Pori, Finland. In June, TVO and its shareholders agreed on ownership arrangements of shares entitling to a share of Meri-Pori power plant's production capacity. According to the agreement signed in June, Fortum will acquire TVO’s shareholders' shares of the production capacity of the Meri-Pori power plant. Fortum will be 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.

Meri-Pori

The amount of electricity produced by TVO's share at the Meri-Pori coal-fired power plant was 659.7 (130.7) GWh requiring 242.2 (46.7) thousand tons of coal and 524.3 (120.7) thousand tons of carbon dioxide emission rights.

Research and development

Research and development costs were EUR 15.7 (16.4) 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 2018, TVO's contribution to the Finnish State Nuclear Waste Management Fund, which finances such programs, amounted to EUR 7.2 (7.2) million.

Acquisitions of tangible and intangible assets and shares

Investments in 2018 were EUR 181.2 (299.4) million. Investments of the parent company were EUR 176.7 (297.9) million, of which EUR 107.9 (224.7) million were allocated to the OL3 EPR project. The compensation of EUR 450 million from the Supplier to TVO associated in the settlement agreement reduces the investment cost of OL3 EPR plant unit.

Carbon dioxide emission allowances have been relinquished to the Energy authority worth EUR 0.7 (2.7) million. In 2018, emission allowances were acquired worth EUR 8.7 (0.7) 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, positive impact on the climate, safeguarding the shareholder value and good work community .

TVO Group and its entire personnel are committed to a high standard safety culture (Chapter 17.1. 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 it is included in Company's terms of procurement. Code of Conduct training was completed by 335 persons in total in 2018. The Code of Conduct is published on TVO's website at https://www.tvo.fi/code-of-conduct.

TVO has committed to promote the following United Nation's 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 will be published in spring 2019 on TVO's online annual report http://vuosikertomus.tvo.fi/annualreport2018. TVO's Responsibility report has had a limited audition by an external party. The information of Environmental report included in Responsibility report has verificated 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 follow realization of major responsibility issues.

	Objective 2018	Actual 2018
Reputation index	-	-
Personnel survey, category	B	A
Reports suspecting violations of the Company's Code of Conduct	-	6
Sick leaves, %	< 2.2	3.1
Occupational accident frequency	< 3.2	3.6
Collective radiation dose, manmSv	1055	1101
Number of environmental incidents, pcs	0	2*
Unplanned energy unavailability factor, %	0	2.2
Number of unplanned automatic scrams, pcs	0	3

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 2019.
Personnel survey: AAA=Excellent, AA+=Good+, AA=Good, A+=Satisfactory+, A= Satisfactory, B=Negative, C=Weak. Implemented 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. *During the year occurred one incident and one earlier incident was cleared.
Unplanned energy unavailability factor: % of total production.

Procedures of Nuclear industry were enhanced

The principles of management and working policies in nuclear power plant were developed in 2018 by defining the expectations for Nuclear professionals ie. the expectations for working in nuclear plant and by executing measures to enforce the expectations. The expectations were included in TVO's Operating System.

The expectations of nuclear professional cover the features of all personnel and contractors working in Olkiluoto. They also include function specified expectations for production, lifecycle management, safety, construction site standards, maintenance and final disposal.

Function specified expectations are complied jointly with Company's policies, instructions and procedures in every day work. Implementation of expectations for Nuclear professional will be continued in 2019.

Results of Ethical Business

TVO does not accept any kind of corruption or bribery. The Code of Conduct requires employees to refrain from transactions and retreat from situations, which 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 inside 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 includes also active monitoring and periodical reviewing of suppliers. By supplier reviews the Company ensures that suppliers follow good practices on environmental, personnel and quality management related issues. During 2018, 152 suppliers were reviewed by 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 six notifications of possible violations against TVO's Code of Conduct in 2018 and implemented necessary actions.

Safety and occupational safety

Safety

Safe use of the Olkiluoto nuclear power plant is based on competent and responsible personnel, high-quality plant technology, 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 the entire TVO personnel is 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 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 Table "Objectives and results of TVO's responsibility principle" (Chapter 16) 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 2018, the Olkiluoto nuclear power plant had nine INES classified issues, of which eight incidents classified as level 0 (No safety significance) and 1 (Anomaly, exceptional incident with safety effects). 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 plan of corrective measures. TVO publishes information on every significant event with public interest on the company website in the News section.

Occupational safety

TVO has developed a certified occupational health and safety system, which also includes construction operations at the OL3 EPR site in the areas where TVO is responsible, to meet the requirements of the OHSAS 18001 standard. In 2018 TVO commenced a project to renew its occupational and safety system to meet the requirements of the ISO 45001 standard. The projects objective is also to unify TVO's and Posiva's occupational safety systems.

The group-level goal of occupational safety in 2018 was to enhance correct use of personal safety equipment in Olkiluoto, to support safety oriented working in the manager level and to develop risk review and management. The accident frequency in 2018 in Olkiluoto was 3.6 (accidents per million work hours), which did not meet the Company's goal of less than 3.2 accidents per million work hour. TVO personnel, Posiva personnel and all contractors working in Olkiluoto are included in the accident frequency calculation, excluding OL3 site, which is reported by Plant Supplier Consortium AREVA-Siemens.

Key occupational safety figures for 2018 are reported in further detail in the corporate responsibility and environmental reporting on the TVO website at http://vuosikertomus.tvo.fi/annualreport2018.

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. The system is EMAS registered, and its goal is continuous improvement and raising the level of environmental protection.

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. 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 2018. The most significant environmental impact 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 temperature of cooling water remained within the limits required by the environmental permit. The environmental load caused by the Olkiluoto nuclear power plant was minimal. Radioactive emissions into the atmosphere and water were below regulatory limits.

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.

In 2018 one environmental incident occured in Olkiluoto. In the incident oil was leaked on the soil from a construction vehicle. As result, 5 m3 of contaminated soil material was cleaned in the incident area. In addition, an incident happened during the construction works of OL1 was detected. In total 250 tons of contaminated soil material was removed from the zone under supervision of a third party operator. Five minor environmental incidents occurred in Olkiluoto during 2018.

In the beginning of 2019 TVO detected that the gathering efficiency of exhaustion pipe's sampling system of aerosol emissions had not been taken into account in the emission report of OL1 and OL2 plant units during their usage history. For this reason, the results of reported aerosol emissions will be specified later. The effect of aerosol releases to the calculated annual environmental dose is insignificantly small.

Risks related to the environment have been recognized and no significant risks influencing operations were detected in risk analysis. Risk management is used to predict any non-conformances and prevent their consequences, which may be hazardous to the environment. The power plant's emergency preparedness plan was updated in 2018.

In December 2016, The Regional State Administrative Agency for Southern Finland issued decisions on the adjustment of the Olkiluoto nuclear power plant's environmental permit and water permit regulations. Environmental permit and water permit decisions were made on power plant's functions and backup energy production. Vaasa Supreme administrative Court gave its decision in June 19 and it came into force in July 2018.

Environmental issues from 2018 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 on the TVO website at http://vuosikertomus.tvo.fi/annualreport2018. 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 878 (807), and the average during the year was 872 (801). The year-end total number of personnel in TVO was 877 (806), and the average during the year was 871 (800). The year-end total for permanent personnel was 862 (783).

TVO recruited 134 (110) employees in 2018. During the year, 55 (47) permanent employees left the Company, including 9 (8) who retired and 12 employees who were moved to Admister Oy in the transfer of a business. TVO's sick leave percentage was 3.1 (2.1).

In the end of May two TVO management group members left the compary: Anna Lehtiranta who was responsible for Corporate relations and Risto Siilos who was responsible for Legal affairs and procurement. In October 2018, Ulla-Maija Moisio was appointed as member of management group and responsible for Legal affairs by the TVO Board of Directors. The appointment entered into force as of November 1, 2018.

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 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 project. The goals of the project 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 project is monitored on a regular basis and the project's effectiveness is measured with e.g. regular personnel surveys. In 2018, the project has focused on work community skills and supervisory communication.

The focus of occupational health care is 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 2018 will be found in more detail in connection with corporate social responsibility reporting on TVO's website, http://vuosikertomus.tvo.fi/annualreport2018.

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. The personnel was trained for a total of 13,532 (10,639) days, on average 15.4 (13.2) days per each TVO employee (including TVONS).

In 2018, 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.

OL3 operators attended a plant knowledge course organized by the Supplier as well as basic simulator courses. OL3 operators work in shifts in the combined operating organization of the Supplier and TVO, carrying out system operation and monitoring tasks. During 2018, OL3 operators also participated in the extensive review and validation work of OL3 operation instructions. OL3 operators were licenced by the Radiation and Nuclear Safety Authority (STUK) in December 2018.

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 2018, a total of 3,579 (4,069) people took the general part of the induction training and 1,681 (2,438) people the radiation protection part (those recorded by January 11 2019). Both training courses were offered in Finnish and English. Both parts are also available for rehersal 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 the expectations of TVO concerning work quality and correct procedures. 828 TVO staff, 1,930 contractor workers and 55 officials were trained. Trained persons were 2,758 in total.

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.

A group-wide Competence survey progressed as planned during 2018. Competence survey is used to ensure the availability of the competence and abilities required by the Company's strategy, thus securing the attainability of the Group's goals.

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 does nuclear waste management consultancy and planning, research and development activity related to the industry.

Major events after the end of the year

TVO has EUR 1,300 millions syndicated revolving credit facility in total which consists of two Tranches. EUR 1,000 millions matures in 2023 and EUR 300 millions matures in 2021. In February 2019 TVO signed an extension agreement where the maturity of EUR 300 millions Tranche was extended to 2022.

On 25 February 2019 Radiation and Nuclear Safety Authority (STUK) gave its statement on operating licence application of Olkiluoto 3 EPR plant unit. STUK does not see any obstacles to grant the licence as applied until the end of 2038. STUK has reviewed, accordingly with the Nuclear Energy Act, OL3 EPR plant unit's safety, and also operation of the TVO Group as entity, such as resources, know-how and nuclear waste management. The Finnish Government makes the decision on the operating licence.

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 to support the Supplier to complete the project according to the Supplier’s plant ramp-up program, so that the fuel loading will be possible to implement in June 2019 as scheduled by the Supplier and OL3 can be connected to the grid for the first time in October 2019. According to the statement given by the Radiation and Nuclear Safety Authority (STUK) on 25 February 2019, TVO has met the prerequisites to receive a decision on operating licence of OL3 EPR plant unit from the Finnish Government. TVO estimates that OL3 will produce 2–4 terawatt hours of electricity, at varying power levels, during the period of time between the first connection to the grid and the start of regular electricity production.

The Meri-Pori coal-fired power plant capacity will be used in accordance with Fortum’s operation plan in 2019.

Posiva’s final disposal project is planned to proceed to construction phase during 2019.

Proposals to the Annual General Meeting

Teollisuuden Voima Oyj's distributable equity as of December 31, 2018 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€)	2018	2017	2016	2015	2014
Turnover	**350**	321	343	276	327
Profit/loss for the financial year	**-18**	-9	-11	5	-1
Research expenses	**16**	16	14	17	18
Investments	**181**	299	265	345	339
Equity	**1 745**	1 667	1 589	1 612	1 575
Subordinated shareholder loans (hybrid equity) (included in the former) [2) 4)]	**679**	579	479	479	439
Non-current and current interest-bearing liabilities (excluding loan from VYR) [1)]	**4 141**	3 923	4 179	3 654	3 428
Loan from VYR	**666**	656	1 027	1 009	983
Provision related to nuclear waste management	**952**	953	955	971	930
Balance sheet total	**7 662**	7 354	7 952	7 464	7 054
Equity ratio, % [3)]	**29**	29,0	26,6	29,4	30,6
Average number of personnel	**872**	801	765	794	863

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

2) Subordinated loans

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

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€)	2018	2017	2016	2015	2014
Profit/loss for the financial year (IFRS)	**-18**	-9	-11	5	-1
The impact of the nuclear waste management obligation [1)] (profit -/loss +)	**22**	18	17	3	6
Other IFRS adjustments	**-1**	-1	-1	-1	0
Share of the profit/loss of joint ventures	**-1**	-1	-2	0	0
Profit/loss before appropriations	**2**	7	3	7	5
Adjusted profit/loss for the financial year	**2**	7	3	7	5

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

	2018	2017	2016	2015	2014
TVO's share in the Finnish State Nuclear Waste Management Fund (VYR) (M€)	**1 480,0**	1 436,6	1 379,7	1 357,8	1 324,2
TVO's funding target obligation to the Finnish State Nuclear Waste Management Fund	**1 505,8**	1 470,8	1 428,4	1 369,4	1 345,4
The carrying value of TVO's share in the Finnish State Nuclear Waste Management Fund (non-current assets)	**952,0**	953,1	954,6	971,2	930,3

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

TEOLLISUUDEN VOIMA OYJ (FAS) (M€) Parent company's financial statement has been prepared in accordance with the Finnish Accounting Standards (FAS).	**2018**	2017	2016	2015	2014
Turnover	**346**	316	340	273	325
Profit/loss before appropriations	**1**	6	3	7	5
Fuel costs	**72**	57	69	59	66
Nuclear waste management costs	**58**	64	73	38	51
Capital expenditure (depreciation and financial income and expenses)	**53**	51	52	111	59
Investments	**177**	298	262	344	339
Equity [4]	**857**	863	858	858	858
Appropriations [4]	**187**	185	183	180	173
Non-current and current interest-bearing liabilities (excluding loan from VYR and loans from equity holders of the company) [1] [2]	**4 070**	3 833	4 043	3 509	3 288
Loans from equity holders of the company [2]	**679**	579	479	479	439
Loan from VYR	**666**	656	1 027	1 009	983
Balance sheet total	**6 619**	6 272	6 793	6 252	5 879
Equity ratio, % [3]	**29,0**	29,0	26,4	28,9	30,0
Average number of personnel	**871**	800	764	791	858

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

[2] Subordinated loans

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

[4] During the accounting period 2017, accumulated depreciation difference has been corrected to be similar to accumulated depreciation difference in taxation. The effect of the correction is EUR 5,100 thousand between appropriations and retained earnings/loss.

Electricity delivered to equity holders of the company (GWh)	**2018**	2017	2016	2015	2014
Olkiluoto 1	**6 742**	7 144	7 035	7 387	7 254
Olkiluoto 2	**7 321**	6 241	7 288	6 851	7 486
Total Olkiluoto [1]	**14 063**	13 385	14 323	14 238	14 740
Meri-Pori	**660**	131	563	167	400
Total	**14 723**	13 516	14 886	14 405	15 140

[1] Includes wind power 0.0 (0.6 in 2017) GWh and gas turbine power 0.0 (0.1) GWh.

Capacity factors, %	**2018**	2017	2016	2015	2014
Olkiluoto 1	**87,8**	93,1	91,4	96,2	94,5
Olkiluoto 2	**94,3**	81,3	94,6	89,2	97,4
Total capacity factor	**91,1**	87,2	93,0	92,7	96,0

TVO share of the electricity used in Finland, %	**2018**	2017	2016	2015	2014
	16,9	15,8	17,5	17,5	18,2

TVO Group financial statements
Consolidated income statement

EUR 1 000	Note	**1 Jan-31 Dec 2018**	1 Jan-31 Dec 2017
Turnover	3	**350 271**	320 928
Work performed for own purpose	4	**14 941**	12 888
Other income	5	**11 762**	11 844
Materials and services	6	**-140 260**	-120 911
Personnel expenses	7	**-63 480**	-57 728
Depreciation and impairment charges	3,8	**-55 181**	-54 385
Other expenses	9	**-103 401**	-92 717
Operating profit/loss		**14 652**	19 919
Finance income	10	**13 170**	12 239
Finance expenses	10	**-47 435**	-42 881
Total finance income and expenses	3	**-34 265**	-30 642
Share of the profit/loss of joint ventures		**1 387**	1 290
Profit/loss before income tax		**-18 226**	-9 433
Income taxes	11	**0**	2
Profit/loss for the financial year		**-18 226**	-9 431
Profit/loss for the financial year attributable to:			
Equity holders of the company		**-18 226**	-9 431

Consolidated statement of comprehensive income

EUR 1 000	**1 Jan-31 Dec 2018**	1 Jan-31 Dec 2017
Profit/loss for the financial year	**-18 226**	-9 431
Other comprehensive items		
Items that may be reclassified to profit or loss in subsequent periods:		
Changes in fair values of share investments	**0**	-14
Cash flow hedges	**7 125**	-9 181
Total other comprehensive profit/loss items	**7 125**	-9 195
Total comprehensive profit/loss for the financial year	**-11 101**	**-18 626**
Total comprehensive profit/loss for the financial year attributable to:		
Equity holders of the company	**-11 101**	-18 626

Consolidated balance sheet

EUR 1 000	Note	31 Dec 2018	31 Dec 2017
Assets			
Non-current assets			
Property, plant and equipment	12	**5 353 160**	5 261 866
Intangible assets	13	**11 333**	4 662
Loans and other receivables	16	**669 295**	658 679
Investments in joint ventures	14	**5 989**	4 602
Investments in shares	17	**1 934**	1 934
Derivative financial instruments	20	**31 999**	35 291
Share in the Finnish State Nuclear Waste Management Fund	24	**952 020**	953 136
Total non-current assets		**7 025 730**	6 920 170
Current assets			
Inventories	19	**260 594**	257 090
Trade and other receivables	16	**149 640**	21 294
Derivative financial instruments	20	**5 240**	14 670
Cash and cash equivalents	18	**221 166**	140 239
Total current assets		**636 640**	433 293
Total assets		**7 662 370**	7 353 463
Equity and liabilities			
Capital and reserves attributable to equity holders of the company			
Share capital	21	**600 365**	606 193
Share premium reserve and statutory reserve	21	**242 383**	242 383
Reserve for invested non-restricted equity	21	**3**	0
Fair value and other reserves	21	**2 650**	-4 475
Subordinated shareholder loans (hybrid equity)	21	**679 300**	579 300
Retained earnings	21	**220 556**	243 293
Total equity		**1 745 257**	1 666 694
Liabilities			
Non-current liabilities			
Provision related to nuclear waste management	24	**952 020**	953 136
Loan from the Finnish State Nuclear Waste Management Fund	22	**666 242**	655 518
Bonds	22	**2 582 556**	2 525 834
Other financial liabilities	22	**1 067 941**	943 997
Derivative financial instruments	20,22	**30 252**	24 360
Total non-current liabilities		**5 299 011**	5 102 845
Current liabilities			
Current financial liabilities	22	**459 513**	392 540
Derivative financial instruments	20,22	**706**	35 934
Advance payments received	23	**20 398**	20 099
Trade payables	23	**7 184**	6 160
Other current liabilities	23	**130 301**	129 191
Total current liabilities		**618 102**	583 924
Total liabilities		**5 917 113**	5 686 769
Total equity and liabilities		**7 662 370**	7 353 463

An correction has been made to trade receivables and advance payments received in year 2017. The effect of the correction is EUR -20,079 thousand.

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 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:								
Changes in fair values of share investments	0	0	0	0	0	0	0	0
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**

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 2017	**606 193**	**242 383**	**0**	**4 720**	**479 300**	**256 656**	**1 589 252**	**1 589 252**
Profit/loss for the financial year	0	0	0	0	0	-9 431	-9 431	-9 431
Other comprehensive profit/loss items:								
Changes in fair values of share investments	0	0	0	-14	0	0	-14	-14
Cash flow hedges	0	0	0	-9 181	0	0	-9 181	-9 181
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	-3 932	-3 932	-3 932
Equity 31 Dec 2017	**606 193**	**242 383**	**0**	**-4 475**	**579 300**	**243 293**	**1 666 694**	**1 666 694**

Consolidated cash flow statement

EUR 1 000	Note	2018	2017
Operating activities			
Profit/loss for the financial year		**-18 226**	-9 431
Adjustments:			
Income tax expenses		**0**	-2
Finance income and expenses		**34 265**	30 642
Depreciation and impairment charges		**55 181**	54 385
Share of the profit/loss of joint ventures		**-1 387**	-1 290
Other non-cash flow income and expenses		**-15 161**	-15 683
Sales profit/loss of property, plant and equipment and shares		**14**	-224
Changes in working capital:			
Increase (-) or decrease (+) in non-interest-bearing receivables		**-6 204**	24 176
Increase (-) or decrease (+) in inventories		**-3 503**	-7 666
Increase (+) or decrease (-) in short-term non-interest-bearing liabilities		**2 284**	-46 445
Interest paid and other finance expenses		**-3 624**	-4 260
Interest received		**3 878**	5 734
Taxes paid		**0**	2
Cash flow from operating activities		**47 517**	29 938
Investing activities			
Acquisition of property, plant and equipment		**-620 478**	-287 195
OL3 EPR project compensation		**328 000**	0
Proceeds from sale of property, plant and equipment		**15**	41
Acquisition of intangible assets		**-155**	-143
Acquisition of shares		**0**	-6
Investments in fund units		**0**	200 000
Proceeds from sale of shares		**0**	486
Loan receivables granted		**-10 867**	-15 603
Repayments of loans granted		**240**	387 278
Cash flow from investing activities		**-303 245**	284 858
Financing activities			
Reduction of share capital		**-5 825**	0
Withdrawals of subordinated shareholder loans (hybrid equity)		**100 000**	100 000
Withdrawals of long-term loans		**804 993**	100 000
Repayment of long-term loans		**-719 644**	-632 135
Interest paid of subordinated shareholder loans (hybrid equity)		**-4 285**	-3 710
Increase (+) or decrease (-) in current financial liabilities		**161 416**	-50 948
Cash flow from financing activities		**336 655**	-486 793
Change in cash and cash equivalents		**80 927**	-171 997
Cash and cash equivalents 1 Jan		**140 239**	312 236
Cash and cash equivalents 31 Dec	18	**221 166**	140 239

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 will be 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 27 February 2019. 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 proportion it has consumed the electricity generated or transferred by the Company:

- Acquisition, transport, transportation insurance, storage and handling costs of fuel;
- Taxes depending on the power production, and
- 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 of the number of shares in particular series it holds:

- Normal operating, maintenance and administrative costs;
- Other taxes than those depending on the power production;
- Insurance costs;
- 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;
- Depreciations;
- Costs set out in the Nuclear Energy Act incurred by the Company's nuclear waste management (concerning the nuclear power plants), and
- 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 at 31 December 2018. 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 2017. The Group has adopted the following amendments to existing standards on 1 January 2018:

- IFRS 9 Financial Instruments

The standard replaced the multiple classification and measurement models in IAS 39 and it brought changes to classification and measurement of financial assets, their impairment assessment and hedge accounting. The new impairment model requires the recognition of impairment provisions based on expected credit losses. The Group applies to the recognition of the credit risk of trade receivables a simplified provision matrix, because the annual consolidated credit losses have been very low and trade receivables do not include any significant financial components. Thus the expected credit losses referred to in the new model do not have any significant impact. The classification of financial assets will not change remarkably.

Loan receivables will still be measured at amortized cost and no changes has not come in the recognition practice applied to financial liabilities, because the Group does not have any liabilities to which fair value options would be applied.

Fund units investments are measured at fair value, and changes in fair value are recognized through profit or loss to the income statement. Direct market prices are not available for unquoted shares and therefore their fair value is determined using methods based on management judgement. The hedge accounting model presented in IFRS 9 facilitates the application of hedge accounting and the new hedge accounting rules aligned the accounting for hedging instruments more closely with common Group risk management practices. The hedge ratios of the Group, based on IAS 39, met the requirements of IFRS 9 as well. The application of consolidated operative hedge accounting was facilitated as the adoption of IFRS 9 eliminated the 80–125% retrospective effectiveness requirement. With the adoption of IFRS 9, the assessment of hedge effectiveness will be exclusively prospective. The ineffectiveness of consolidated hedge ratios is expected to remain very low also in the future.

The IFRS 9 standard defines three requirements for hedge effectiveness for the application of hedge accounting. The first one requires an economic relationship between the hedged item and the hedging instrument. This means that changes in the values of the hedging instrument and the hedged item can be expected to be opposite as they are based on a shared instrument or risk. The standard also requires that the effect of credit risk does not dominate value changes caused by the economic relationship. Thirdly, the hedging degree of the hedge ratio shall be the same as the hedging degree based on the quantity of the item actually hedged by the entity and the quantity of the hedging instrument actually used by the entity to hedge the quantity of the hedged item in question. IFRS 9 requires the same hedging degree as the one actually used in risk management. These changes did not have any significant impact on the Group.

- IFRS 15 Revenue from Contracts with Customers

The group has adopted IFRS 15 Revenue from Contracts with Customers from 1 January 2018, which resulted in changes in accounting policies and disclosure of new notes. The standard replaced IAS 18 which covered contracts for goods and services and IAS 11 which covers construction contracts.

The new standard is based on the principle that revenue is recognised when control of a good or service transfers to a customer – so the notion of control replaces the existing notion of risks and rewards.

A new five-step process must be applied before revenue can be recognised:

- identify contracts with customers
- identify the separate performance obligation
- determine the transaction price of the contract
- allocate the transaction price to each of the separate performance obligations, and
- recognise the revenue as each performance obligation is satisfied.

The standard did not change the recognition of the revenue. Turnover of the Group mainly consist of electricity revenue, which will still be recognized based on delivery. Revenue on sales of the electricity are divided into variable and fixed charges, see General information on the Group, TVO's cost-price principle. As a result of the new standard, Group will disclose a new note concerning trade receivables starting from 2018 financial statements. The new note will divide trade receivables between nuclear power and coal-fired power and also between production of electricity and services.

- Annual Improvements 2014-2016: IFRS 12 Disclosure of Interests in Other Entities and IAS 28 Investments in Associates and Joint Ventures
- IFRS 4 (amendment) Insurance Contracts
- IFRS 2 (amendment) Share-based Payment Transactions
- IFRIC 22 Foreign Currency Transactions and Advance Considerations

- IAS 40 (amendment) Investment Property

The following new standards, interpretations and amendments to existing standards and interpretations issued already will be adopted by the Group in 2019:

- IFRS 16 Leases

The standard removes the current distinction between operating and financing leases and requires recognition of an asset (the right to use the leased item) and a financial liability to pay rentals for virtually all lease contracts. Under IFRS 16, a contract is, or contains, a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

As at the reporting date, the group has non-cancellable operating lease commitments of EUR 1,462 thousand, see note 25 Obligations and other commitments. Of these commitments, approximately EUR 230 thousand relate to low value leases which will be recognised on a straight-line basis as expense in profit or loss.

The group will apply the standard from its mandatory adoption date of 1 January 2019. The group intends to apply the simplified transition approach and will not restate comparative amounts for the year prior to first adoption. Right-of-use assets for property leases will be measured on transition as if the new rules had always been applied. All other right-of-use assets will be measured at the amount of the lease liability on adoption.

For the remaining lease commitments the group expects to recognise right-of-use assets of approximately EUR 760 thousand on 1 January 2019 and lease liabilities of approximately EUR 760 thousand.

- IAS 19 Employee Benefits[1)]
- IFRIC 23 Uncertainty over Income Tax Treatments
- IFRS 9 (amendment) Financial Instruments
- IAS 28 (amendment) Investments in Associates and Joint Ventures[1)]
- Annual Improvements 2015-2017[1)]

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

- IFRS 3 Business Combinations[2)]
- IAS 1 (amendment) Presentation of financial statements and IAS 8 (amendment) Accounting policies, changes in accounting estimates and errors[2)]
- IFRS 17 Insurance Contracts[3)]

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 2019.

[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 2020.

[3)]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 each investor.

TVO's joint venture is Posiva Oy, which main activities (A series) is 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 payed retrospectively in the 24th 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 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	20–35 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 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

Finance leases

Leases are classified as finance leases when all substantial risks and rewards incidental to ownership are transferred to the Group. Assets acquired under finance leases are recognized in the balance sheet at the commencement of the lease term at the fair value of the leased asset or, if lower, the present value of the minimum lease payments. Leased assets are depreciated over the shorter of the useful life of the asset and the lease term. Lease obligations are recognized under interest-bearing liabilities.

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.

Other leases

Lease payments under other leases are recognized in the income statement as an expense under the accrual principle on a straight-line basis over the lease term.

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

The IFRS 9 Financial Instruments standard has replaced the IAS 39 standard and brought changes to measuring and classifying financial assets, determining their impairment as well as the principles of hedge accounting. 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 amortised 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 recognised at fair value on their trade date.

Financial assets are derecognised 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.

Recognised at fair value through profit or loss

Derivative financial instruments that do not meet the criteria of the IFRS 9 standard are recognised at fair value through profit or loss. Profit and loss resulting from changes in fair value are recognised 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 recognised 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.

Amortised cost

Amortised 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 recognised as a non-current asset. After initial recognition, all loan and other receivables are measured at amortised cost using the effective interest method. Trade receivables are recognised 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 recognised 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 the new impairment model, the impairment of financial assets must be determined using a model based on expected credit losses. From the Group's perspective, the new 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 recognised 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 amortised cost, the Group performs active monitoring and recognises 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 recognised 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 reorganisation, 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 amortised cost.

Financial liabilities are recognised at fair value including transaction expenses. After initial recognition, all financial liabilities are measured at amortised 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 recognised 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 recognised 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 requires a financial connection 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 organisation actually hedges and the amount of the hedging instrument that the organisation 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. These changes have no significant impact for the Group.

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 recognised 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 recognised 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 recognised in inventories is recognised 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 recognised 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 recognised 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 recognised 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 recognised in the income statement.

Fair value hedging

The Group applies fair value hedges 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 recognised 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 interest rate used in the measurement of provisions is the estimated long-term borrowing rate plus the ECP's inflation target and an estimated company-specific risk premium. 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.

According to the comprehensive settlement agreement signed in March 2018, TVO and the Supplier jointly withdrew the pending arbitration proceedings under the International Chamber of Commerce (ICC) rules with respect to costs and losses incurred in relation to delays in the construction of the OL3 EPR project. In June 2018, the ICC tribunal confirmed the arbitration settlement by a consent award, and the arbitration proceedings were terminated. The parties also withdrew the pending appeals in the General Court of the European Union.

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 settlement agreement stipulates that:

- In order to provide and maintain adequate and competent technical and human resources for the completion of the OL3 EPR project, Areva will source the necessary additional resources from Framatome S.A.S., whose majority owner is Electricité de France (EDF).
- The supplier consortium companies undertake that the funds dedicated to the completion of the OL3 EPR project will be adequate and will cover all applicable guarantee periods, including setting up a trust mechanism funded by Areva companies to secure the financing of the costs of completion of the OL3 EPR project.
- The turnkey principle of the OL3 EPR plant contract and the joint and several liability of the supplier consortium companies remain in full force.
- The ICC arbitration concerning the costs and losses caused by the delay of the OL3 EPR project was settled by financial compensation of EUR 450 million to be paid to TVO in two installments by the supplier consortium companies.
- The parties withdraw all on-going legal actions related to OL3 EPR, including the ICC arbitration and appeals in the General Court of the European Union.
- In the event that the supplier consortium companies fail to complete the OL3 EPR project by the end of 2019, they will pay a penalty to TVO for such delay in an amount which will depend on the actual time of completion of the OL3 EPR project and may not exceed EUR 400 million.

The amount 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 criterias 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 coal-fired power segment is produced by TVO share at the Meri-Pori coal-fired power plant. Fortum will be 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 in group level.

Turnover by segments

EUR 1 000	**2018**	2017
Nuclear power	**305 842**	307 561
Coal-fired power	**44 429**	13 367
Total	**350 271**	320 928

Depreciation and impairment charges by segments

EUR 1 000	**2018**	2017
Nuclear power	**43 498**	43 224
Coal-fired power	**9 153**	7 798
Depreciation and impairment charges (FAS)	**52 651**	51 022
The impact of the nuclear waste management obligation	**2 461**	3 335
Other IFRS adjustments	**69**	28
Total (IFRS)	**55 181**	54 385

Finance income and expenses by segments

EUR 1 000	**2018**	2017
Nuclear power	**430**	483
Coal-fired power	**-322**	-78
Finance income and expenses (FAS)	**108**	405
The impact of the nuclear waste management obligation	**35 263**	31 381
The impact of financial instruments	**-335**	-37
Other IFRS adjustments	**-771**	-1 107
Total (IFRS)	**34 265**	30 642

Profit/loss for the financial year by segments

EUR 1 000	2018	2017
Nuclear power	6 155	10 597
Coal-fired power	-4 240	-3 402
Profit/loss before appropriations (FAS)	1 915	7 195
The impact of the nuclear waste management obligation	-22 564	-19 032
The impact of financial instruments	335	37
Other IFRS adjustments	701	1 079
Share of the profit/loss of joint ventures	1 387	1 290
Total (IFRS)	-18 226	-9 431

Assets by segments

EUR 1 000	2018	2017
Nuclear power	6 606 883	6 266 653
Coal-fired power	12 525	5 744
Total (FAS)	6 619 408	6 272 397
The impact of the nuclear waste management obligation	1 006 169	1 029 849
The impact of financial instruments	2 070	12 348
The impact of finance leases	53 166	54 889
Other IFRS adjustments	-23 421	-19 611
Share of the profit/loss of joint ventures	4 978	3 591
Total (IFRS)	7 662 370	7 353 463

Trade receivables by segments

EUR 1 000	2018	2017
Nuclear power	15 035	13 440
Coal-fired power	3 426	190
Total (FAS)	18 461	13 630
Total (IFRS)	18 461	13 630

Group-wide disclosures

Turnover shared to production of electricity and services

EUR 1 000	2018	2017
Production of electricity	345 702	316 171
Services	4 569	4 757
Total	350 271	320 928

Trade receivables shared to production of electricity and services

EUR 1 000	2018	2017
Production of electricity	17 457	13 305
Services	1 004	325
Total	18 461	13 630

Information about geographical areas

Teollisuuden Voima Oyj is company owned by Finnish industrial and power companies. TVO delivers electricity to its shareholders at cost price (so-called Mankala principle) , i.e. 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 inventories of nuclear fuel acquisition.

4 Work performed for own purpose

EUR 1 000	2018	2017
Personnel expenses related to OL3	14 941	12 888
Total	14 941	12 888

5 Other income

EUR 1 000	2018	2017
Rental income	1 074	1 238
Profits from sales of property, plant and equipment and shares	0	259
Sales of services	9 617	9 509
Other income	1 070	839
Total	11 762	11 844

6 Materials and services

EUR 1 000	2018	2017
Nuclear fuel	68 783	64 604
Coal	6 346	207
Materials and supplies	4 736	4 652
CO_2 emission rights	8 660	677
Nuclear waste management services [1)]	42 734	48 233
Increase (-) or decrease (+) in inventories	-4 064	-8 249
External services	13 065	10 786
Total	140 260	120 911

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

7 Personnel expenses

Employee benefit costs

EUR 1 000	2018	2017
Wages and salaries	52 618	49 000
Pension expenses - defined contribution plans	9 166	6 686
Other compulsory personnel expenses	1 696	2 042
Total	63 480	57 728

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

	2018	2017
Office personnel	717	666
Manual workers	155	135
Total	872	801

Number of personnel on December 31

	2018	2017
Office personnel	**713**	671
Manual workers	**165**	136
Total	**878**	807

8 Depreciation and impairment charges

EUR 1 000	2018	2017
Intangible assets		
Computer software	**399**	414
Other intangible assets	**1 242**	841
Total	**1 641**	1 255
Property, plant and equipment		
Buildings and construction	**5 876**	6 648
Machinery and equipment	**42 842**	40 481
Other property, plant and equipment	**2 360**	2 666
Decommissioning	**2 461**	3 335
Total	**53 539**	53 130
Total	**55 181**	54 385

9 Other expenses

EUR 1 000	2018	2017
Maintenance services	**29 760**	21 024
Regional maintenance and service	**8 744**	9 329
Research services	**3 927**	4 300
Other external services	**28 356**	24 223
Real estate tax	**6 135**	4 828
Rents	**946**	1 204
ICT expenses	**4 090**	3 937
Personnel related expenses	**4 869**	4 267
Corporate communication expenses	**859**	810
Other expenses	**15 716**	18 795
Total	**103 401**	92 717

Auditors' fees and not audit-related services

PricewaterhouseCoopers Oy

EUR 1 000	2018	2017
Audit fees	**115**	115
Other services	**87**	170
Total	**202**	285

10 Finance income and expenses

Items included in the income statement

EUR 1 000	2018	2017
Interest income from loans and other receivables		
Nuclear waste management loan receivables from equity holders of the company	**3 364**	3 772
Other	**106**	76
Hedge accounted derivatives		
Ineffective portion of the change in fair value in cash flow hedge relationship	**0**	3
Ineffective portion of the change in fair value in fair value hedge relationship	**2**	9
Non-hedge accounted derivatives		
Change in fair value	**485**	167
Interest income from assets related to nuclear waste management	**9 213**	8 212
Finance income, total	**13 170**	12 239
Interest expenses and other finance expenses		
To the Finnish State Nuclear Waste Management Fund	**3 364**	3 772
To others	**-558**	-637
Hedge accounted derivatives		
Ineffective portion of the change in fair value in cash flow hedge relationship	**0**	5
Interest rate swaps, fair value hedges	**-4 575**	-9 622
Fair value adjustment of loan attributable to interest rate risk	**4 575**	9 622
Ineffective portion of the change in fair value in fair value hedge relationship	**0**	5
Non-hedge accounted derivatives		
Change in fair value	**152**	133
Realised derivative expenses, net	**1**	11
Interest expenses of provision related to nuclear waste management	**44 476**	39 592
Finance expenses, total	**47 435**	42 881
Total	**-34 265**	-30 642

Other comprehensive items
Other comprehensive items related to derivative financial instruments:

EUR 1 000	2018	2017
Cash flow hedges		
Changes in the fair value of which the following items have transferred	**-4 527**	-17 507
Transfers to the consolidated income statement	**-31**	-42
Transfers to inventories	**1 148**	4 020
Transfers to the nuclear power plant under construction	**-12 769**	-12 304
Transferred items, total	**-11 652**	-8 326
Cash flow hedges, total	**7 125**	-9 181
Changes in fair values of the share investments	**0**	-14
Total other comprehensive items	**7 125**	-9 195

11 Income tax expense

EUR 1 000	2018	2017
Taxes based on the taxable income of the financial year	**0**	2
Total	**0**	2

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

2018 1 000	Land and water areas	Buildings and construction	Machinery and equipment	Other property, plant and equipment	Construction in progress and advance payments	Decom-missioning	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

2017 EUR 1 000	Land and water areas	Buildings and construction	Machinery and equipment	Other property, plant and equipment	Construction in progress and advance payments	Decom-missioning	Total
Acquisition cost 1 Jan	12 137	291 644	1 375 592	55 370	4 517 834	168 330	6 420 907
Increase	0	307	15 107	142	283 044	0	298 600
Decrease	0	-345	-7 125	-27	-7 869	-15 697	-31 063
Transfer between categories	0	2 611	59 894	0	-62 505	0	0
Acquisition cost 31 Dec	12 137	294 217	1 443 468	55 485	4 730 504	152 633	6 688 444
Accumulated depreciation and impairment charges according to plan 1 Jan	0	237 938	1 026 850	43 269	0	72 584	1 380 641
Accumulated depreciation from deduction	0	-112	-7 054	-27	0	0	-7 193
Depreciation for the period	0	6 648	40 480	2 666	0	3 336	53 130
Accumulated depreciation and impairment charges according to plan 31 Dec	0	244 474	1 060 276	45 908	0	75 920	1 426 578
Book value 31 Dec 2017	**12 137**	**49 743**	**383 192**	**9 577**	**4 730 504**	**76 713**	**5 261 866**
Book value 1 Jan 2017	12 137	53 706	348 742	12 101	4 517 834	95 746	5 040 266

The costs for the new plant unit (OL3) under construction constituted EUR 4.8 billion of the advance payments in 2018 (EUR 4.7 billion in 2017).

Property, plant and equipment included finance lease agreements:

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

EUR 1 000	Construction in progress
Book value 1 Jan 2017	72 669
Increase	46
Book value 31 Dec 2017	**72 715**

The assets acquired through financial lease agreements are accumulated as costs for construction in progress so there is no accumulated depreciation.

13 Intangible assets

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

2017 EUR 1 000	CO_2 emission rights	Computer software	Other intangible assets	Advance payments	Total
Acquisition cost 1 Jan	2 662	21 176	21 782	0	45 620
Increase	677	144	0	0	821
Decrease	-2 662	0	0	0	-2 662
Acquisition cost 31 Dec	677	21 320	21 782	0	43 779
Accumulated depreciation and impairment charges according to plan 1 Jan	0	18 768	19 094	0	37 862
Depreciation for the period	0	414	841	0	1 255
Accumulated depreciation and impairment charges according to plan 31 Dec	0	19 182	19 935	0	39 117
Book value 31 Dec 2017	**677**	**2 138**	**1 847**	**0**	**4 662**
Book value 1 Jan 2017	2 662	2 408	2 688	0	7 758

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 2018 was 99.76 % (99.66 % in 2017). The average interest rate on loans and derivatives on 31 December, see note 27.

2018 **Capitalized interest costs during construction** 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

2017 **Capitalized interest costs during construction** 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	1 156 144	1 306 197
Increase	0	0	0	0	102 180	102 180
Decrease	0	0	0	0	-3 947	-3 947
Acquisition cost 31 Dec	3 530	31 133	112 781	2 609	1 254 377	1 404 430
Accumulated depreciation and impairment charges according to plan 1 Jan	3 049	24 007	87 457	1 990	0	116 503
Depreciation for the period	106	444	1 692	34	0	2 276
Accumulated depreciation and impairment charges according to plan 31 Dec	3 155	24 451	89 149	2 024	0	118 779
Book value 31 Dec 2017	**375**	**6 682**	**23 632**	**585**	**1 254 377**	**1 285 651**
Book value 1 Jan 2017	481	7 126	25 324	619	1 156 144	1 189 694

14 Investments in joint ventures

EUR 1 000	**2018**	2017
Posiva Group	**5 989**	4 602
31 Dec	**5 989**	4 602

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 per cent 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 Articles of Association and Shareholders Agreement. TVO is liable for approximately 74 per cent 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 shareholder's 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.

Summarised financial information (FAS) for Posiva Group

Posiva Oy and Posiva Solutions Oy are private companies and there is no quoted market prices available for their shares. In the consolidated financial statements Posiva Group is accounted by the equity method of accounting.

Summarised balance sheet	2018 Posiva Group	2017 Posiva Group
Current		
Cash and cash equivalents	**15 079**	14 664
Other current assets (excluding cash)	**8 069**	4 850
Total current assets	**23 147**	19 514
Financial liabilities (excluding trade payables)	**-378**	-363
Other current liabilities (including trade payables)	**-11 603**	-10 146
Total current liabilities	**-11 981**	-10 509
Non-current		
Assets	**1 465**	1 899
Financial liabilities	**-4 185**	-4 342
Total non-current liabilities	**-4 185**	-4 342
Net assets	**8 446**	6 562
Summarised statement of comprehensive income		
Turnover	**76 725**	71 240
Depreciation and impairment charges	**-50**	-47
Interest income	**18**	31
Interest expense	**-43**	-49
Pre-tax profit from continuing operations	**2 359**	2 196
Income tax expense	**-475**	-445
Post-tax profit from continuing operations	**1 884**	1 751
Reconciliation of summarised financial information		
Operating net assets 1 Jan	**6 562**	4 811
Profit/loss for the period	**1 884**	1 751
Closing net assets	**8 446**	6 562
Interest in joint venture	**5 989**	4 602
Carrying value	**5 989**	4 602

15 Book values of financial assets and liabilities by categories

2018 EUR 1 000	Fair value through profit or loss	At fair value through other comprehensive income items	Amortised 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 holdings				0	0	17
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**	

2017 EUR 1 000	Fair value through profit or loss	At fair value through other comprehensive income items	Amortised cost	Book value total	Fair value total	Note
Non-current assets						
Loans and other receivables			658 678	658 678	658 678	16
Share investments		1 934		1 934	1 934	17
Derivative financial instruments, no hedge accounting	7 497			7 497	7 497	20
Derivative financial instruments, cash flow hedge accounting		8 639		8 639	8 639	20
Derivative financial instruments, fair value hedge accounting	19 155			19 155	19 155	20
Current assets						
Trade and other receivables			21 294	21 294	21 294	16
Derivative financial instruments, no hedge accounting	10 894			10 894	10 894	20
Derivative financial instruments, cash flow hedge accounting		3 775		3 775	3 775	20
Derivative financial instruments, fair value hedge accounting						
Fund units						
Total by category	**37 546**	**14 348**	**679 972**	**731 867**	**731 867**	
Non-current liabilities						
Loan from the Finnish State Nuclear Waste Management Fund			655 518	655 518	655 518	22
Other financial liabilities			3 469 831	3 469 831	3 581 560	22
Derivative financial instruments, no hedge accounting	10 093			10 093	10 093	20
Derivative financial instruments, cash flow hedge accounting		12 703		12 703	12 703	20
Derivative financial instruments, fair value hedge accounting	1 565			1 565	1 565	20
Current liabilities						
Current financial liabilities			392 539	392 539	392 539	22
Trade payables			6 160	6 160	6 160	23
Other current liabilities			129 191	129 191	129 191	23
Derivative financial instruments, no hedge accounting	31 236			31 236	31 236	20
Derivative financial instruments, cash flow hedge accounting		4 698		4 698	4 698	20
Derivative financial instruments, fair value hedge accounting						
Total by category	**42 893**	**17 401**	**4 653 239**	**4 713 533**	**4 825 262**	

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

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**

2017 EUR 1 000	Level 1	Level 2	Level 3
Financial assets at fair value			
Derivative financial instruments, no hedge accounting		18 391	
Derivative financial instruments designated as cash flow hedges		12 414	
Derivative financial instruments designated as fair value hedges		19 155	
Fund units			
Share investments			1 934
Total	**0**	**49 961**	**1 934**
Financial liabilities at fair value			
Derivative financial instruments at fair value through profit or loss		41 329	
Derivative financial instruments designated as cash flow hedges		17 401	
Derivative financial instruments designated as fair value hedges		1 565	
Total	**0**	**60 294**	**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 2018, TVO has unquoted shares worth EUR 1,934 (2017:1,934) 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

2018

EUR 1 000	Gross amounts	Related amounts not set off	Net amount
Derivative financial assets	37 239	14 375	51 614
Derivative financial liabilities	-30 958	-14 375	-45 333

2017

EUR 1 000	Gross amounts	Related amounts not set off	Net amount
Derivative financial assets	49 961	-25 757	24 204
Derivative financial liabilities	-60 294	25 757	-34 538

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	**2018**	2017
Nuclear waste management loan receivables	**666 242**	655 518
Loan receivables	**3 053**	3 161
Total	**669 295**	658 679

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 per cent 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	**2018**	2017
EPV Energia Oy	**72 289**	70 205
Fortum Oyj	**293 236**	284 783
Loiste Holding Oy	**772**	750
Kemira Oyj	**20 507**	19 915
Oy Mankala Ab	**83 580**	83 580
Pohjolan Voima Oyj	**195 859**	196 285
Total	**666 242**	655 518

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 2,548 (2,655) thousand.

Trade and other receivables (current assets)

EUR 1 000	**2018**	2017
Trade receivables	**18 461**	13 630
Loan receivables	**240**	230
Prepayments and accrued income	**130 623**	7 153
Other receivables	**316**	281
Total	**149 640**	21 294

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 2018 the Group had EUR 145 (27) thousand overdue receivables of which EUR 0 (3) 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	**2018**	2017
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	**2018**	2017
Coal		
Replacement cost	**610**	12 613
Book value	**550**	8 674
Difference	**60**	3 939
Raw uranium and natural uranium		
Replacement cost	**80 741**	60 130
Book value	**81 370**	73 952
Difference	**-628**	-13 822
Coal	**550**	8 674
Raw uranium and natural uranium	**81 370**	73 952
Nuclear fuel	**171 436**	167 765
Materials and supplies	**7 238**	6 699
Total	**260 594**	257 090

20 Derivative financial instruments

Nominal values of the derivative financial instruments	Maturity structure					
2018 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**

	Maturity structure					
2017 EUR 1 000	< 1 year	1-3 years	3-5 years	5-7 years	> 7 years	Total
Interest rate swaps	318 446	891 955	839 117	150 000	300 000	2 499 518
Forward foreign exchange contracts and swaps [1)]	25 335	49 736	35 168	21 489	10 981	142 709
Cross-currency swaps	316 929	269 349	56 117	0	0	642 395
Total	**660 710**	**1 211 040**	**930 401**	**171 489**	**310 981**	**3 284 622**

[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			
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**

2017 EUR 1 000	Positive	Negative	Total
Interest rate swaps			
Cash flow hedges	382	-14 738	-14 356
Fair value hedges	19 155	-1 565	17 591
Non-hedges			
Forward foreign exchange contracts and swaps			
Cash flow hedges	12 033	-2 663	9 370
Non-hedges	715	-224	491
Cross-currency swaps			
Non-hedges	17 676	-41 105	-23 429
Total	**49 961**	**-60 294**	**-10 333**

The effect of hedge accounting in financial position and result
EUR 1 000

The interest rate hedging in fair value hedge accounting	**2018**	2017
The book value of the derivative financial instruments, receivables	**13 016**	19 155
The book value of the derivative financial instruments, liabilities	**0**	-1 565
Nominal value	**673 000**	723 000
Due date	**02/2019 - 02/2025**	02/2019 - 02/2025
The book value of the hedged item, receivables	**0**	0
The book value of the hedged item, liabilities	**673 000**	723 000
The degree of hedging	**1:1**	1:1
The change of the basic value in valid hedging instruments since 1.1.	**-4 379**	-11 440
The effectiveness of the hedge used to determine the change of value for the hedged item	**4 764**	11 360
The weighted average interest rate during the year	**2,32 %**	2,42 %

The interest rate hedging in cash flow hedge accounting	**2018**	2017
The book value of the derivative financial instruments,receivables	**0**	382
The book value of the derivative financial instruments, liabilities	**12 199**	14 738
Nominal value	**973 071**	1 376 518
Due date	**02/2019 - 02/2025**	08/2018 - 02/2023
The degree of hedging	**1:1**	1:1
The change of the basic value in valid hedging instruments since 1.1.	**-1 918**	12 210
The effectiveness of the hedge used to determine the change of value for the hedged item	**1 962**	-12 552
The weighted average interest rate during the year	**0,33 %**	0,43 %

The currency hedging in cash flow hedge accounting	**2018**	2017
The book value of the derivative financial instruments,receivables	**15 242**	12 033
The book value of the derivative financial instruments, liabilities	**544**	2 663
Nominal value	**121 628**	142 709
Due date	**01/2019 - 01/2025**	01/2018 - 01/2025
The degree of hedging	**1:1**	1:1
The change of the spot value in valid hedging instruments since 1.1.	**7 959**	-17 364
The effectiveness of the hedge used to determine the change of value for the hedged item	**-7 959**	17 364
The weighted average of protected rate (inc. forward points) during the year (USD)	**1,28**	1,24
The weighted average of protected rate (inc. forward points) during the year (SEK)	**9,57**	9,62

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 2018. TVO does not have a maximum or minimum limit for the share capital. The number of the shares on 31 December 2018 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 2017	1 394 283 730	606 193	242 383	0
31 Dec 2017	1 394 283 730	606 193	242 383	0
31 Dec 2018	**1 394 283 730**	**600 365**	**242 383**	**3**

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

Share number	**31 Dec 2018**	31 Dec 2017
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

TVO's Extraordinary General Meeting held in June 6, 2018, decided to reduce share capital EUR 5,828 thousand, of which EUR 5,825 was returned to shareholders. The carrying value of reserve for invested non-restricted equity in the balance sheet 31 December 2018 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 2018 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 has 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	**2018**	2017
Non-current interest-bearing liabilities		
Loan from the Finnish State Nuclear Waste Management Fund	**666 242**	655 518
Bonds	**2 582 556**	2 525 834
Loans from financial institutions	**867 602**	745 428
Loans from others	**148 033**	144 536
Finance leasing liabilities	**52 306**	54 033
Derivative financial instruments	**30 252**	24 360
Total	**4 346 991**	4 149 709
Current interest-bearing liabilities		
Current portion of long-term bonds	**251 958**	203 211
Current portion of loans from financial institutions	**44 413**	94 413
Current portion of Private Placements	**0**	93 198
Current portion of finance lease liabilities	**1 726**	1 718
Other interest-bearing liabilities (Commercial paper program)	**161 416**	0
Derivative financial instrumentsininenviivas	**706**	35 934
Total	**460 219**	428 474
Total	**4 807 210**	4 578 183

TVO has issued EUR-, USD-, GBP-, and SEK-denominated Private Placements amounting to EUR 984.2 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 2018, the effect of foreign exchange hedges was positive amounting to EUR 16.7 million and correspondingly, the effect of foreign currency denominated loans was negative amounting to EUR 16.7 million.

Maturity period of finance lease liabilities

EUR 1 000	**2018**	2017
Finance lease liabilities - minimum lease payments		
No later than 1 year	**1 735**	1 725
Later than 1 year and no later than 5 years	**7 028**	6 984
Over 5 years	**45 327**	47 090
Total	**54 090**	55 799
Finance expenses to be accrued	**58**	49
Finance lease liabilities - current value of minimum rents		
No later than 1 year	**1 726**	1 718
Later than 1 year and no later than 5 years	**6 992**	6 957
Over 5 years	**45 314**	47 075
Total	**54 032**	55 750

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

23 Trade payables and other current liabilities

EUR 1 000	**2018**	2017
Advances received	**20 398**	20 099
Trade payables	**7 184**	6 160
Accruals and deferred income and other liabilities	**130 301**	129 191
Total	**157 883**	155 451

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

EUR 1 000	**2018**	2017
Finnish State Nuclear Waste Management Fund	**29 818**	38 063
Accrued interests	**44 157**	53 276
Accrued personnel expenses	**18 140**	16 156
Accruals related to CO_2 emission rights	**8 835**	677
Others	**29 352**	21 018
Total	**130 301**	129 191

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 governmental authorities.

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

EUR 1 000	**2018**	2017
The carrying value of TVO`s share in the Finnish State Nuclear Waste Management Fund (non-current assets)	**952 020**	953 136
Provision related to nuclear waste management (non-current liabilities)		
Beginning of the year	**953 136**	954 631
Increase/decrease in provision	**-13 484**	-11 360
Used provision	**-32 108**	-29 728
Changes due to discounting	**44 476**	39 593
End of the year	**952 020**	953 136
The discount rate, %	**5,5**	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	**2018**	2017
Liability for nuclear waste management according to the Nuclear Energy Act	**1 505 800**	1 481 600
TVO's funding target obligation 2019 (2018) to the Finnish State Nuclear Waste Management Fund	**1 505 800**	1 470 800
TVO's share in the Finnish State Nuclear Waste Management Fund 31.12.2018 (31.12.2017)	**1 480 000**	1 436 600
Difference between the liability and TVO's share of the fund 31.12.2018 (31.12.2017)	**25 800**	45 000

The legal liability calculated according to the Nuclear Energy Act in Finland and decided by the supervising authority (Ministry of Employment and the Economy) is EUR 1,505.8 (1,481.6) million on 31 December 2018 (31 December 2017). The carrying value of the liability in the balance sheet calculated according to IAS 37 is EUR 952.0 (953.1) million on 31 December 2018. 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.

TVO's share in the Finnish State Nuclear Waste Management Fund is EUR 1,480.0 (1,436.6) million on 31 December 2018. The carrying value of the TVO's share in the fund in the balance sheet is EUR 952.0 (953.1) million. The difference is due to the fact that IFRIC 5 limits the carrying amount of TVO's interest 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 increase 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.

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 yearly. 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	**2018**	2017
No later than 1 year	**697**	327
Later than 1 year and no later than 5 years	**765**	509
Total	**1 462**	836

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

EUR 1 000	**2018**	2017
Rents	**637**	169
Total	**637**	169

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

Pledged promissory notes and financial guarantees

EUR 1 000	**2018**	2017
Pledged promissory notes to the Finnish State Nuclear Waste Management Fund	**666 242**	655 518
Guarantees given by shareholders related to the nuclear waste management obligation	**135 970**	187 500

The Company under the nuclear waste management obligation is entitled to borrow an amount equal to 75 per cent 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	**2018**	2017
Bank guarantees	**7 000**	6 900

Investment commitments

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

EUR 1 000	**2018**	2017
OL1 and OL2	**88 500**	95 000
OL3	**351 300**	697 000
Total	**439 800**	792 000

Pending Court Cases and Disputes

There were no pending court cases or disputes in the end of period under review.

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.

	2018 **t CO_2**	**EUR 1 000**	2017 t CO_2	EUR 1 000
Total annual emissions from production facilities	**525 815**		121 427	
Possessed emission rights	**531 792**		122 437	
Emission rights and emission right reductions bought [1)]	**530 000**	**8 835**	109 000	677

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 and emission right reductions 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

2018

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

2017

EUR 1 000	Sales	Purchases	Receivables	Liabilities
Posiva Group	10 225	48 687	3 654	9

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

2018

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

2017

EUR 1 000	Sales	Purchases	Receivables	Liabilities
PVO, Fortum Oyj, Fortum Power and Heat Oy	263 641	9 287	511 690	528 417

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	**2018 Senior management**	2017 Senior management
Wages, salaries and other short-term benefits	**2 352**	2 213
Total	**2 352**	2 213

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 CFO 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 per cent 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

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.

Undiscounted cash flows of financial liabilities

2017 EUR 1 000	2018	2019	2020	2021	2022-	Total
Loans from financial institutions [1]	94 413	44 413	244 413	410 213	60 825	854 276
Financing costs [2]	15 268	12 779	9 663	4 975	1 408	44 093
Loan from the Finnish State Nuclear Waste Management Fund [3]					655 518	655 518
Financing costs	3 772	3 501	6 028	8 115	9 753	31 169
Bonds [4]	228 519	558 267	131 955	500 000	1 336 000	2 754 740
Financing costs	73 302	71 579	46 862	46 268	125 123	363 134
Loans from others [4]	88 446		79 114		56 117	223 677
Financing costs	3 412	2 300	2 313	879	882	9 786
Finance lease liabilities	1 718	1 726	1 735	1 744	48 828	55 750
Other liabilities	44 012					44 012
Interest rate derivatives	12 647	6 093	4 240	4 769	6 441	34 190
Total	**565 510**	**700 657**	**526 322**	**976 962**	**2 300 895**	**5 070 346**

EUR 1 000	2018	2019	2020	2021	2022-	Total
Forward foreign exchange contracts	1 307	178	464	497	565	3 010

[1] Repayments in 2018 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 30 and 42 months. At the closing date the duration was 32 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 2018 was 1.81 % (2017: 2.15 %).

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

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

2017 EUR 1 000	2018	2019	2020	2021	2022-	Total
Interest rate swaps						
Cash flows	-11 149	-4 473	-3 233	-2 609	-2 208	-23 673

Sensitivity to market risks

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

EUR 1 000	**2018** **Income statement**	**Equity**	2017 Income statement	Equity
+ 10% change in EUR/USD exchange rate		**-12 134**		-14 222
- 10% change in EUR/USD exchange rate		**12 134**		14 222
1% upward parallel shift in interest rates	**-8 664**	**23 928**	-6 537	33 473
1% downward parallel shift in interest rates	**8 923**	**-11 488**	7 559	-32 057

Assumptions:

The change in EUR/USD exchange rate is assumed to be +/- 10 per cent. The USD-denominated 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

Currency	2018 Nominal amount	Carrying amount	2017 Nominal amount	Carrying amount	Interest rate %	Maturity date
EUR	**193 452**	**193 452**	500 000	500 000	4,625	4.2.2019
EUR	**500 000**	**500 000**	500 000	500 000	2,500	17.3.2021
EUR	**30 000**	**30 000**	30 000	30 000	3,880	9.5.2022
EUR	**100 000**	**100 000**	100 000	100 000	Euribor 6M+1,580	12.9.2022
EUR	**23 000**	**23 000**	23 000	23 000	4,080	1.12.2022
EUR	**20 000**	**20 000**	20 000	20 000	2,800	8.5.2024
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	3.5.2030
EUR	**45 000**	**45 000**	45 000	45 000	3,900	31.3.2032
EUR	**20 000**	**20 000**	20 000	20 000	3,875	8.11.2032
EUR	**500 000**	**500 000**	500 000	500 000	2,125	4.2.2025
EUR	**500 000**	**500 000**	500 000	500 000	2,625	13.1.2023
EUR	**400 000**	**400 000**			2,000	8.5.2024
SEK			875 000	99 977	3,875	13.9.2018
SEK			1 125 000	128 542	Stibor 3M+1,400	13.9.2018
SEK	**600 000**	**58 267**	600 000	58 267	5,300	30.10.2019
SEK	**650 000**	**70 945**	650 000	70 945	Stibor 3M+1,090	17.3.2020
SEK	**550 000**	**61 009**	550 000	61 009	2,840	19.5.2020
SEK	**1 000 000**	**97 561**			0,700	15.2.2022
SEK	**500 000**	**48 780**			1,310	15.2.2024
SEK	**850 000**	**82 927**			2,375	15.2.2024
Total		**2 848 941**		2 754 740		

TVO Group debt structure 31 December 2018

EUR 1 000	2019	2020	2021	2022	2023	2024	2025	2026	2027-	Total
Loans from financial institutions	44 413	44 413	235 212	505 413	30 413				65 000	924 864
Bonds	251 719	131 954	500 000	250 561	500 000	551 707	500 000		163 000	2 848 941
Loans from others		79 114		56 117						135 231
Finance lease liabilities	1 726	1 735	1 744	1 752	1 761	1 770	43 544			54 033
Commercial papers	161 416									161 416
Total	**459 274**	**257 216**	**736 956**	**813 843**	**532 174**	**553 477**	**543 544**		**228 000**	**4 124 484**

Maturity of TVO Group's credit commitments

EUR 1 000	2019	2020	2021	2022	2023	2024	2025	2026	2027-	Total
Syndicated revolving credit facility			300 000		1 000 000					1 300 000
Bilateral revolving credit facility										
Bilateral bank loan	100 000									100 000
Total	**100 000**		**300 000**		**1 000 000**					**1 400 000**

Both syndicated and bilateral facilities are undrawn.

On December 31, 2018, the Group's had undrawn credit facilities amounting to EUR 1,400 million (2017: EUR 1,680 million). In addition, the Group's had subordinated shareholder loan (hybrid equity) commitments totaling EUR 250 million (2017: EUR 350 million) and cash and cash equivalents amounting to EUR 221 million (2017: EUR 140 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 minimise 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 targets to have a minimum equity ratio (IFRS) of 25 per cent 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 per cent. There are no other key ratio-related covenants in the loan contracts.

The equity ratio monitored by TVO Group's management

	2018	2017
Equity ratio, % (IFRS, Group) 1)	**28,9**	29,0
Equity ratio, % (Parent company) 2)	**29,0**	29,0

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

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

Net debt reconciliation

EUR 1 000	**2018**
Cash and cash equivalents	**221 166**
Non-current interest-bearing liabilities (excluding loan from VYR)	**-3 650 497**
Current interest-bearing liabilities	**-459 512**
Net debt	**-3 888 843**

2018 EUR 1 000	Cash and cash equivalents	Current finance lease liabilities	Non-current finance lease liabilities	Current financial liabilities	Non-current financial liabilities	Total
Net debt 31 Dec 2017	140 239	-1 718	-54 032	-390 822	-3 415 799	-3 722 132
Cash and cash equivalents	80 927	1 718	0	-161 416	-76 342	-155 113
Other non-cash flow expenses	0	-1 726	1 726	94 452	-106 050	-11 598
Net debt 31 Dec 2018	**221 166**	**-1 726**	**-52 306**	**-457 786**	**-3 598 191**	**-3 888 843**

28 Changes in accounting principles

The Group adopted the IFRS 9 Financial Instruments standard on 1 January 2018. The IFRS 9 standard replaces the sections of IAS 39 that deal with the recognition, classification and measurement of financial assets and liabilities as well as the impairment and hedge accounting of financial assets. The new hedge accounting rules have brought hedge accounting closer to risk management practices. The IFRS 9 standard also brings changes to other standards dealing with financial instruments, such as the IFRS 7 standard. In accordance with IFRS 9, the comparative information of transitional provisions has not been adjusted.

Impairment of financial assets

According to the new impairment model, any impairment must be recognised based on expected credit losses. According to the IFRS 9 standard, the Group applies a simplified provision matrix to recognising the credit risks of trade receivables. 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 recognised 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 no significant financing component has been included in the trade receivables.

Changes in the classification of financial assets and liabilities

The classification of financial assets based on the new business model includes three different classes. The "Amortised cost" class includes the Group's earlier categories of loan and other receivables as well as sales and other receivables. The "At fair value through profit or loss" class includes the Group's earlier categories of derivative financial instruments and fund holdings recognised at fair value through profit or loss. The "Fair value through other comprehensive income items" class includes the Group's earlier category of investments available for sale with the exception of fund holdings that were previously included in the investments available for sale category. The adoption of the IFRS 9 standard had no significant impact on the classification and measurement of the Group's financial assets and liabilities.

Hedge accounting

The hedge accounting model in accordance with the IFRS 9 standard simplifies the application of hedge accounting and is closer to the Group's risk management strategy. The most important change affecting the Group's hedge accounting was the removal of IAS 39's retrospective effectiveness requirement of 80–125% with the introduction of IFRS 9. According to IFRS 9, the assessment of hedge effectiveness is only future-oriented. The ineffectiveness of the Group's hedging relationships has been and is expected to continue being minor.

The IFRS 9 standard defines three hedge effectiveness requirements for the application of hedge accounting. The first requirement requires a financial connection 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 organisation actually hedges and the amount of the hedging instrument that the organisation 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. These changes have no significant impact for the Group.

	Measurement group	Measurement group	Book value on 1 January 2018	Book value on 1 January 2018	
	Original (IAS 39)	New (IFRS 9)	Original EUR 1 000	New EUR 1 000	Difference
Non-current assets					

Loan and other receivables	Loan and other receivables	Amortised cost	658 678	658 678
Investments in shares	Available-for-sale investments	At fair value through other comprehensive income items	1 934	1 934
Derivative financial instruments, no hedge accounting	Derivative financial instruments at fair value through profit or loss	Fair value through profit or loss	7 497	7 497
Derivative financial instruments, cash flow hedge accounting	Derivative financial instruments designated as cash flow hedges	At fair value through other comprehensive income items	8 639	8 639
Derivative financial instruments, fair value hedge accounting	Derivative financial instruments designated as fair value hedges	Fair value through profit or loss	19 155	19 155
Current assets				
Trade and other receivables	Loan and other receivables	Amortised cost	21 294	21 294
Fund holdings	Available-for-sale investments	Fair value through profit or loss	0	0
Derivative financial instruments, no hedge accounting	Derivative financial instruments at fair value through profit or loss	Fair value through profit or loss	10 894	10 894
Derivative financial instruments, cash flow hedge accounting	Derivative financial instruments designated as cash flow hedges	At fair value through other comprehensive income items	3 775	3 775
Derivative financial instruments, fair value hedge accounting	Derivative financial instruments designated as fair value hedges	Fair value through profit or loss		
Non-current liabilities				
Loan from the State Nuclear Waste Management Fund	Financial liabilities measured at amortised cost	Amortised cost	655 518	655 518
Other financial liabilities	Financial liabilities measured at amortised cost	Amortised cost	3 469 831	3 469 831
Derivative financial instruments, no hedge accounting	Derivative financial instruments at fair value through profit or loss	Fair value through profit or loss	10 093	10 093
Derivative financial instruments, cash flow hedge accounting	Derivative financial instruments designated as cash flow hedges	At fair value through other comprehensive income items	12 703	12 703
Derivative financial instruments, fair value hedge accounting	Derivative financial instruments designated as fair value hedges	Fair value through profit or loss	1 565	1 565
Current liabilities				
Current financial liabilities	Financial liabilities measured at amortised cost	Amortised cost	392 539	392 539
Accounts payable	Financial liabilities measured at amortised cost	Amortised cost	6 160	6 160
Other current liabilities	Financial liabilities measured at amortised cost	Amortised cost	129 191	129 191
Derivative financial instruments, no hedge accounting	Derivative financial instruments at fair value through profit or loss	Fair value through profit or loss	31 236	31 236
Derivative financial instruments, cash flow hedge accounting	Derivative financial instruments designated as cash flow hedges	At fair value through other comprehensive income items	4 698	4 698
Derivative financial instruments, fair value hedge accounting	Derivative financial instruments designated as fair value hedges	Fair value through profit or loss	0	0

29 Events after the balance sheet date

TVO has EUR 1,300.0 million syndicated revolving credit facility in total which consists of two Tranches. EUR 1,000.0 million matures in 2023 and EUR 300.0 million matures in 2021. In February 2019 TVO signed an extension agreement where the maturity of the EUR 300.0 million Tranche was extended to 2022.

On 25 February 2019 Radiation and Nuclear Safety Authority (STUK) gave its statement on operating licence application of Olkiluoto 3 EPR plant unit. STUK does not see any obstacles to grant the licence as applied until the end of 2038. STUK has reviewed according to the Nuclear Energy Act OL3 EPR plant unit's safety, and also operation of the TVO Group as entity, such as resources, know-how and nuclear waste management. The Finnish Government makes the decision on the operating licence.

Parent company's financial statements
Parent company's income statement

EUR 1 000	Note	1 Jan-31 Dec 2018	1 Jan-31 Dec 2017
Turnover	2	**345 702**	316 170
Work performed for own purpose	3	**14 941**	12 888
Other income	4	**14 931**	15 032
Materials and services	5	**-154 871**	-135 956
Personnel expenses	6	**-63 300**	-57 650
Depreciation and impairment charges	7	**-52 651**	-51 022
Other expenses	8	**-103 399**	-92 693
Operating profit/loss		**1 353**	6 769
Financial income and expenses	9	**-109**	-405
Profit/loss before appropriations and taxes		**1 244**	6 364
Appropriations	10	**-1 244**	-6 364
Profit/loss for the financial year		**0**	0

Parent company's balance sheet

EUR 1 000	Note		**31 Dec 2018**		31 Dec 2017
Assets					
Non-current assets					
Intangible assets	11		**11 333**		4 662
Tangible assets	11		**5 281 001**		5 164 346
Investments					
Holdings in group companies	12	8		8	
Holdings in joint ventures	12	1 011		1 011	
Other investments	12	673 515	**674 534**	662 897	663 916
Total non-current assets			**5 966 868**		5 832 924
Current assets					
Inventories	13		**260 594**		257 090
Current receivables	14		**171 227**		42 498
Cash and cash equivalents			**220 051**		139 621
Total current assets			**651 872**		439 209
Total assets			**6 618 740**		6 272 133
Equity and liabilities					
Equity					
Share capital	15		**600 365**		606 193
Share premium reserve	15		**232 435**		232 435
Statutory reserve	15		**9 948**		9 948
Reserve for invested non-restricted equity	15		**3**		0
Retained earnings (loss)	15,16		**14 460**		14 460
Profit (loss) for the financial year	15,16		**0**		0
Total equity			**857 211**		863 036
Appropriations			**187 333**		185 418
Liabilities					
Non-current liabilities	17, 18		**3 612 905**		3 421 316
Shareholders' loans	17		**679 300**		579 300
Loan from the Finnish State Nuclear Waste Management Fund	17		**666 242**		655 518
Current liabilities	19		**615 749**		567 545
Total liabilities			**5 574 196**		5 223 679
Total equity and liabilities			**6 618 740**		6 272 133

An correction has been made to trade receivables and advance payments received in year 2017. The effect of the correction is EUR -20,079 thousand.

Parent company's cash flow statement

EUR 1 000	2018	2017
Operating activities		
Operating profit/loss	**1 353**	6 769
Adjustments to operating profit /loss [1)]	**52 665**	50 798
Changes in working capital [2)]	**-7 603**	-29 390
Interest paid and other financial expenses	**-3 634**	-4 272
Interest received	**3 876**	5 734
Cash flow from operating activities	**46 657**	29 639
Investing activities		
Acquisition of shares	**0**	-6
Acquisition of non-current assets	**-626 625**	-292 745
OL3 EPR project compensation	**328 000**	0
Investments in fund units	**0**	200 000
Proceeds from sale of other investments	**0**	486
Proceeds from sale of intangible and tangible assets	**15**	41
Loan receivables granted	**-10 867**	-15 603
Repayments of loans granted	**240**	387 279
Cash flow from investing activities	**-309 237**	279 451
Financing activities		
Reduction of share capital	**-5 825**	0
Withdrawals of long-term loans	**904 993**	200 000
Repayment of long-term loans	**-717 926**	-630 426
Increase (+) or decrease (-) in short-term interest-bearing liabilities	**161 416**	-50 948
Group contribution received	**353**	388
Cash flow from financing activities	**343 011**	-480 985
Change in cash and cash equivalents	**80 431**	-171 896
Cash and cash equivalents 1 Jan	**139 620**	311 516
Cash and cash equivalents 31 Dec	**220 051**	139 620

[1)] Adjustments to operating profit/loss		
Depreciation and write-downs	**52 651**	51 022
Gain (-) or loss (+) from divestment of non-current assets	**14**	-224
Total	**52 665**	50 798

[2)] Changes in working capital		
Increase (-) or decrease (+) in inventories	**-3 503**	-7 666
Increase (-) or decrease (+) in non-interest-bearing receivables	**-5 870**	24 949
Increase (+) or decrease (-) in short-term non-interest-bearing liabilities	**1 770**	-46 673
Total	**-7 603**	-29 390

Notes to the parent company's 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	20–35 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 per cent 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	2018	2017
Olkiluoto 1 and Olkiluoto 2	**301 274**	302 803
Meri-Pori	**44 428**	13 367
Total	**345 702**	316 170

Electricity delivered to equity holders of the company (GWh)		
Olkiluoto 1	**6 742**	7 144
Olkiluoto 2	**7 321**	6 241
Total Olkiluoto [1)]	**14 063**	13 385
Meri-Pori	**660**	131
Total	**14 723**	13 516

[1)] Includes wind energy 0.0 (0.6 in 2017) GWh and energy produced by gas turbine 0.0 (0.1) GWh.

3 Work performed for own purpose

EUR 1 000	2018	2017
Personnel expenses related to OL3	**14 941**	12 888

4 Other income

EUR 1 000	2018	2017
Rental income	**1 082**	1 246
Sales profit of tangible assets and shares	**2**	259
Sales of services	**12 778**	12 689
Other income	**1 069**	838
Total	**14 931**	15 032

5 Materials and services

EUR 1 000	2018	2017
Purchases, accrual basis		
Nuclear fuel	**68 783**	64 604
Coal	**6 346**	207
Materials and supplies	**4 736**	4 652
Increase (-) or decrease (+) in inventories	**-4 064**	-8 249
Total	**75 801**	61 214
CO_2 emission rights	**8 660**	677
Nuclear waste management		
Contribution to the Finnish State Nuclear Waste Management Fund [1)]	**25 787**	34 189
Nuclear waste management services	**32 108**	29 728
Total	**57 895**	63 917
External services	**12 515**	10 148
Total	**154 871**	135 956

[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	**57 694**	53 904
Coal	**14 470**	3 371
Materials and supplies	**3 637**	3 939
Total	**75 801**	61 214

6 Notes concerning personnel and members of administrative bodies

	2018	2017
Average number of personnel		
Office personnel	**716**	665
Manual workers	**155**	135
Total	**871**	800

Number of employees 31 Dec		
Office personnel	**712**	670
Manual workers	**165**	136
Total	**877**	806

EUR 1 000	**2018**	2017
Personnel expenses		
Wages and salaries	**52 461**	48 920
Pension expenses	**9 148**	6 684
Other compulsory personnel expenses	**1 691**	2 046
Total	**63 300**	57 650

Salaries and fees paid to management		
President and CEO deputy and members of the Board of Directors	**850**	895

7 Depreciation and impairment charges

EUR 1 000	**2018**	2017
Depreciation according to plan		
Other capitalised long-term expenses	**1 641**	1 255
Buildings and construction	**5 876**	6 648
Machinery and equipment	**42 773**	40 453
Other tangible assets	**2 361**	2 666
Total	**52 651**	51 022

8 Other expenses

EUR 1 000	2018	2017
Maintenance services	**29 760**	21 024
Regional maintenance and service	**8 744**	9 329
Research services	**3 927**	4 300
Other external services	**28 384**	24 227
Real estate tax	**6 134**	4 828
Rents	**946**	1 204
ICT expenses	**4 090**	3 936
Personnel related expenses	**4 863**	4 265
Corporate communication expenses	**852**	807
Other expenses	**15 699**	18 773
Total	**103 399**	92 693

Auditors' fees and not audit-related services

PricewaterhouseCoopers Oy

EUR 1 000	2018	2017
Audit fees	**109**	113
Other services	**86**	170
Total	**195**	283

9 Financial income and expenses

EUR 1 000	2018	2017
Interest income on long-term investments		
From joint ventures	**23**	26
From others	**3 365**	3 773
Total	**3 388**	3 799
Other interest and financial income		
From others	**80**	49
Total	**80**	49
Interest income on long-term investments and other interest and financial income, total	**3 468**	3 848
Interest expenses and other financial expenses		
To the Finnish State Nuclear Waste Management Fund	**3 364**	3 772
To others	**109 695**	105 062
Capitalised interest costs	**-109 482**	-104 581
Total	**3 577**	4 253
Total financial income (+) and expenses (-)	**-109**	-405
Financial income and expenses include exchange rate gains (+) and losses (-) (net)	**31**	-158

10 Appropriations

EUR 1 000	**2018**	2017
Group contribution	**670**	831
The difference between depreciation according to plan and tax depreciation, increase (-) or decrease (+)	**-1 914**	-7 195
Total	**-1 244**	-6 364

11 Non-current assets

EUR 1 000	Formation expenses	Intangible rights	Other capitalised long-term expenses	Advance payments	Total
Intangible assets					
Acquisition cost 1 Jan 2018	57 961	677	43 767	0	102 405
Increase	0	8 835	147	7	8 989
Decrease	-3 950	-677	-17 838	0	-22 465
Acquisition cost 31 Dec 2018	54 011	8 835	26 076	7	88 929
Accumulated depreciation according to plan 1 Jan	57 961	0	39 782	0	97 743
Accumulated depreciation from deduction	-3 950	0	-17 838	0	-21 788
Depreciation according to plan	0	0	1 641	0	1 641
Book value 31 Dec 2018	**0**	**8 835**	**2 491**	**7**	**11 333**
Accumulated depreciation difference 1 Jan	0	0	2 046	0	2 046
Change in depreciation difference	0	0	-709	0	-709
Accumulated depreciation difference 31 Dec	0	0	1 337	0	1 337
Undepreciated acquisition cost in taxation 31 Dec 2018	0	8 835	1 154	7	9 996

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 2018	12 137	291 931	1 442 266	54 820	4 713 155	6 514 311
Increase	0	1 372	22 399	99	143 821	167 693
Decrease	0	-28 889	-140 893	-1 862	0	-171 645
Transfer between categories	0	442	49 774	282	-50 498	0
Acquisition cost 31 Dec 2018	12 137	264 856	1 373 546	53 339	4 806 478	6 510 358
Accumulated depreciation according to plan 1 Jan	0	244 473	1 060 247	45 244	0	1 349 963
Accumulated depreciation from deduction	0	-28 889	-140 864	-1 862	0	-171 614
Depreciation according to plan	0	5 876	42 773	2 360	0	51 010
Book value 31 Dec 2018	**12 137**	**43 396**	**411 390**	**7 597**	**4 806 478**	**5 281 001**
Accumulated depreciation difference 1 Jan	0	-9 226	189 963	2 635	0	183 370
Change in depreciation difference	0	1 950	636	37	0	2 624
Accumulated depreciation difference 31 Dec	0	-7 277	190 599	2 672	0	185 994
Undepreciated acquisition cost in taxation 31 Dec 2018	12 137	50 672	220 791	4 925	4 806 478	5 095 005

Share of machinery and equipment from book value 31 Dec 2018	400 016
Share of machinery and equipment from book value 31 Dec 2017	369 573

Capitalised borrowing costs included in non-current assets

EUR 1 000	Formation expenses	Other capitalised long-term expenses	Buildings and construction	Machinery and equipment	Other tangible assets	Construction in progress	Total
Interest during construction period							
Acquisition cost 1 Jan 2018	11 601	3 530	31 133	112 781	2 609	1 290 798	1 452 452
Increase	0	0	0	0	0	109 401	109 401
Decrease	-555	-2 363	-4 011	-17 387	-208	0	-24 524
Acquisition cost 31 Dec 2018	11 046	1 167	27 122	95 394	2 401	1 400 199	1 537 329
Accumulated depreciation from deduction	11 601	3 155	24 451	89 149	2 023	0	130 379
Accumulated depreciation according to plan 1 Jan	-555	-2 363	-4 011	-17 386	-207	0	-24 522
Depreciation according to plan	0	107	444	1 692	33	0	2 276
Book value 31 Dec 2018	**0**	**268**	**6 238**	**21 939**	**552**	**1 400 199**	**1 429 196**
Accumulated depreciation difference 1 Jan	0	374	6 682	23 632	585	0	31 273
Change in depreciation difference	0	-106	-444	-1 693	-33	0	-2 276
Accumulated depreciation difference 31 Dec	0	268	6 238	21 939	551	0	28 996
Undepreciated acquisition cost in taxation 31 Dec 2018	0	0	0	0	0	1 400 199	1 400 199

12 Investments

EUR 1 000	Holdings in group companies	Holdings in joint ventures	Other stocks and shares	Loan receivables, joint ventures	Loan receivables, others	Total
Acquisition cost 1 Jan 2018	8	1 011	4 218	2 656	656 023	663 916
Increase	0	0	0	132	11 151	11 283
Decrease	0	0	0	-239	-426	-665
Acquisition cost 31 Dec 2018	8	1 011	4 218	2 549	666 748	674 534
Book value 31 Dec 2018	**8**	**1 011**	**4 218**	**2 549**	**666 748**	**674 534**

Loan from the Finnish State Nuclear Waste Management Fund lent further to the equity holders of the company	**666 242**	**666 242**

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	2018	2017
Coal		
Replacement cost	**610**	12 612
Book value	**550**	8 674
Difference	**60**	3 938
Raw uranium and natural uranium		
Replacement cost	**80 741**	60 131
Book value	**81 369**	73 952
Difference	**-628**	-13 821
Coal	**550**	8 674
Raw uranium and natural uranium	**81 370**	73 952
Nuclear fuel	**171 436**	167 765
Supplies	**7 238**	6 699
Total	**260 594**	257 090

14 Current receivables

EUR 1 000	2018	2017
Receivables from group companies		
Accrued income	**1 741**	1 313
Total	**1 741**	1 313
Receivables from joint ventures		
Trade receivables	**67**	0
Loan receivables	**239**	230
Prepayments and accrued income	**1 147**	1 281
Total	**1 453**	1 511
Receivables from others		
Trade receivables	**17 390**	13 305
Other receivables	**122 307**	163
Total	**139 697**	13 468
Prepayments and accrued income		
Prepaid interests	**21 798**	20 858
Accrued interest income	**3 364**	3 772
Other accrued income	**3 135**	1 535
Other prepaid expenses	**39**	40
Total	**28 336**	26 205
Total	**171 227**	42 497

15 Equity

EUR 1 000	2018	2017
Share capital 1 Jan 2018	**606 193**	606 193
Reduction of share capital	**-5 828**	0
Share capital 31 Dec 2018	**600 365**	606 193
Share premium reserve 1 Jan 2018	**232 435**	232 435
Share premium reserve 31 Dec 2018	**232 435**	232 435
Statutory reserve 1 Jan 2018	**9 948**	9 948
Statutory reserve 31 Dec 2018	**9 948**	9 948
Reserve for invested non-restricted equity 1 Jan 2018	**0**	0
Change	**3**	0
Reserve for invested non-restricted equity 31 Dec 2018	**3**	0
Retained earnings/loss 1 Jan 2018	**14 460**	9 360
Change [1)]	**0**	5 100
Retained earnings/loss 31 Dec 2018	**14 460**	14 460
Profit/loss for the financial year	**0**	0
Total	**857 211**	863 036

[1)] During the accounting period 2017, accumulated depreciation difference have been corrected to be similar to accumulated depreciation difference in taxation. The effect of the correction have been EUR 5,100 thousand between appropriations and retained earnings/loss.

16 Distributable equity

EUR 1 000	2018	2017
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	2018	2017
Bonds	**2 597 223**	2 526 221
Loans from financial institutions	**875 652**	755 064
Other loans	**140 031**	140 031
Shareholders' loans [1)]	**679 300**	579 300
Loan from the Finnish State Nuclear Waste Management Fund [2)]	**666 241**	655 518
Total	**4 958 447**	4 656 134

[1)] Subordinated loans.

[2)] Lent further to the shareholders.

BONDS

Euro Medium Term Note Programme EUR 4.000.000.000

Currency	**Capital 2018**	EUR 1 000 2018	Capital 2017	EUR 1 000 2017	Maturity date
EUR	**193 452**	**193 452**	500 000	500 000	4.2.2019 [1)]
EUR	**500 000**	**500 000**	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**	0	0	8.5.2024
SEK	**0**	**0**	875 000	99 977	13.9.2018 [1)]
SEK	**0**	**0**	1 125 000	128 542	13.9.2018 [1)]
SEK	**600 000**	**58 267**	600 000	58 267	30.10.2019 [1)]
SEK	**650 000**	**70 945**	650 000	70 945	17.3.2020
SEK	**550 000**	**61 009**	550 000	61 009	19.5.2020
SEK	**1 000 000**	**97 561**	0	0	15.2.2022
SEK	**500 000**	**48 780**	0	0	15.2.2024
SEK	**850 000**	**82 927**	0	0	15.2.2024
Total		**2 848 941**		2 754 740	

[1)] Current portion of long-term bonds EUR 251,719 (228,519) thousand.

OTHER LOANS

US Private Placements

Currency	**Capital 2018**	**EUR 1 000 2018**	Capital 2017	EUR 1 000 2017	Maturity date
USD	**0**	**0**	55 000	53 111	19.8.2018 [1)]
GBP	**0**	**0**	42 000	35 336	19.8.2018 [1)]
USD	**50 000**	**39 557**	50 000	39 557	26.8.2020
USD	**50 000**	**39 557**	50 000	39 557	26.8.2020
GBP	**50 000**	**56 116**	50 000	56 116	15.11.2022
Total		**135 230**	247 000	223 677	
Collateral received		**4 800**		4 800	
Total		**140 030**		228 477	

[1)] Current portion of other loans EUR 0 (88,446) thousand.

18 Debts due in more than five years

EUR 1 000	**2018**	2017
Debts due in more than 5 years	**1 953 098**	1 792 713

19 Current liabilities

EUR 1 000	**2018**	2017
Liabilities from joint ventures		
Accruals	**1 974**	9
Total	**1 974**	9
Liabilities from others		
Advances received	**20 398**	20 099
Trade payables	**8 257**	7 228
Total	**28 655**	27 327
Interest-bearing liabilities		
Bonds	**251 719**	228 519
Loans from financial institutions	**44 412**	94 413
Commercial paper program	**161 416**	0
Private Placements	**0**	88 446
Total	**457 547**	411 378
Accruals and deferred income		
Finnish State Nuclear Waste Management Fund	**26 454**	34 291
Accrued interests	**47 522**	57 049
Accrued personnel expenses	**17 595**	16 013
Accruals related to CO_2 emission rights	**8 834**	677
Other accruals and deferred income	**27 168**	20 801
Total	**127 573**	128 831
Total	**615 749**	567 545

20 Commitments

EUR 1 000	**2018**	2017
Leasing liabilities		
Leasing liabilities falling due in less than a year	**2 433**	2 052
Leasing liabilities falling due later	**53 120**	54 584
Total	**55 553**	56 636

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	**2018**	2017
Bank guarantees	**7 000**	6 900

Nuclear waste management

EUR 1 000	**2018**	2017
Liability for nuclear waste management according to the Nuclear Energy Act [1)]	1 505 800	1 481 600
TVO's funding target obligation 2019 (2018) to the Finnish State Nuclear Waste Management Fund	1 505 800	1 470 800
Collateral for nuclear waste management contingencies	135 970	187 500
Nuclear waste management loan receivables pledged to the Finnish State Nuclear Waste Management Fund	666 242	655 518

[1)] Based on the nuclear waste management programme 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	**2018**	2017
Interest rate derivatives		
Interest rate swaps (nominal value)	**2 196 071**	2 499 518
Fair value	**-2 287**	3 234
Forward foreign exchange contracts		
Forward foreign exchange contracts (nominal value)	**121 628**	142 709
Fair value	**15 344**	9 862
Cross-currency swaps		
Cross-currency swaps (nominal value)	**554 697**	642 395
Fair value	**6 775**	23 429

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 2018**	Number 2017	**EUR 1 000 2018**	EUR 1 000 2017
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	**5 828**	5 828
Change	**0**	0	**-5 828**	0
31 Dec	**34 283 730**	34 283 730	**0**	5 828
Total	**1 394 283 730**	1 394 283 730	**600 365**	606 193

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 Carbon dioxide 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 company possesses, the company has booked the expense for exceeding emission rights at the market value on 31 December.

	2018 t CO_2	**EUR 1 000**	2017 t CO_2	EUR 1 000
Total annual emissions from production facilities	**525 815**		121 427	
Possessed emission rights	**531 792**		122 437	
Emission rights and emission right reductions bought [1)]	**530 000**	**8 835**	109 000	677

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 and emission right reductions are included in materials and services. The emission rights that company possesses on 31 December are included in intangible rights on the balance sheet and emission right reductions.

Proposals to the Annual General Meeting

Teollisuuden Voima Oyj's distributable equity as of December 31, 2018 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 27, 2019

Matti Ruotsala	Ilkka Tykkyläinen
Esa Kaikkonen	Tapio Korpeinen
Pekka Manninen	Markus Mannström
Markus Rauramo	Anders Renvall
Tiina Tuomela	Rami Vuola

Jarmo Tanhua
President and CEO

The auditor's note

Our auditor's report has been issued today.

Helsinki, February 27, 2019

PricewaterhouseCoopers Oy
Authorised Public Accountants

Jouko Malinen
Authorised Public Accountant

Auditor's report

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 2018. 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

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

- 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
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 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 as well as accounting principles: TVO's cost-price principle and Power plant construction in progress - OL3 EPR 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 € 4.8 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 have been capitalised on this item.	We audited the internal controls of the company relating to approval of expenses capitalized on the OL3 project. In addition, we reviewed company management measures, records and other documentation regarding monitoring of progress of the project. We tested, on a sample basis, 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 accounting principle "Assets and provisions related to the nuclear waste management obligation" and "Critical accounting estimates and judgements', "The provision for future obligations for the decommissioning of the nuclear power plant and for the disposal of spent fuel". 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 € 952 million 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 reviewed long-term 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 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 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. Division of cash flows into costs related to decommissioning of a nuclear power plant and those related to disposal of spent fuel affects the outcome of the calculation. We tested whether the division described above is made according to the documented fundamentals and whether the division as a rule remains the same from one accounting period to another.
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 27 February 2019

PricewaterhouseCoopers Oy
Authorised Public Accountants

Jouko Malinen
Authorised Public Accountant (KHT)

Financial information in 2019

In 2019, Teollisuuden Voima Oyj will publish the interim reports as follows:

Interim Report for January–March 2019 on April 23, 2019
Interim Report for January–June 2019 on July 18, 2019
Interim Report for January–September 2019 on October 21, 2019