

A woman with short dark hair, wearing a brown coat, a white skirt, and black tights, stands on a rocky shore. She is looking out over a body of water towards a distant forested shoreline under a sunset sky. The sun is low on the horizon, creating a strong reflection on the wet rocks in the foreground. The scene is peaceful and scenic.

CREDIT INVESTOR PRESENTATION

30 September 2021

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TVO IN BRIEF

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TVO – AN EXPERIENCED PIONEER

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- Non-listed public limited liability company producing electricity to its shareholders at cost
- Annual Production (14.7 TWh), approximately 18% of the total electricity consumption (81 TWh*) in Finland (2020)
- Annual turnover EUR 275 million
- Approximately 970 employees

*) Finnish Energy, Energy Year 2020 (Feb 2021)
Source: TVO, TVO annual report 2020



OVERVIEW OF UNITS

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Olkiluoto 1 (OL1) and Olkiluoto 2 (OL2)

- OL1 890 MW, OL2 890 MW (BWR), Westinghouse Atom
- Commercial operation since 1979 and 1982
- Modernization and upgrade in several stages from 660 MW to 890 MW

Olkiluoto 3 EPR* (OL3)

- 1,600 MW (PWR), AREVA-Siemens Consortium
- Under nuclear commissioning

Posiva Oy (Subsidiary, 60%)

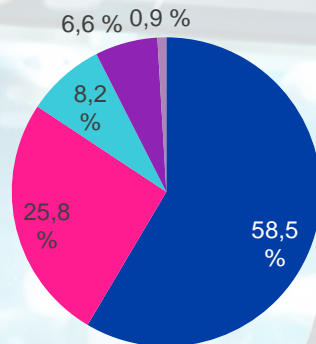
- Responsible for the final disposal of spent fuel produced by its shareholders

*) European Pressurized Reactor

TVO OWNERSHIP STRUCTURE

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July 1, 2021



- Pohjolan Voima Oyj (PVO), 58.5%
- Fortum Power and Heat Oy, 25.8%
- Oy Mankala Ab, 8.2%
- EPV Energia Oyj, 6.6%
- Kemira Oyj, 0.9%

Underlying shareholders by sector

Industrial companies	47%
Municipalities	27%
Fortum	26%

*) UPM Energy Oy is the subsidiary of UPM-Kymmene Oy, rated Baa1 by Moody's and BBB by S&P

Main shareholders of PVO (Dec 31, 2020):

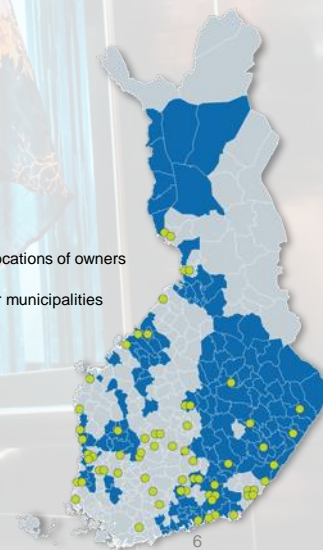
- UPM Energy Oy* : 47.73%
- Stora Enso Oyj (Baa3, BBB-) : 15.61%

Shareholder of Fortum Power and Heat Oy:

- Fortum Oyj (Baa2, BBB) : 100%

TVO's shareholders are Finnish industrial and energy companies - the latter are owned by **131 municipalities.**

- Industrial locations of owners
- TVO-owner municipalities



TVO KEY INDICATORS 2016 - 2020

	2020	2019	2018	2017	2016
Electricity delivered (GWh)					
OL1/OL2	14 563	14 729	14 063	13 385	14 323
Meri-Pori	82	182	660	131	563
Total	14 645	14 911	14 723	13 516	14 886
Load factor (%)					
OL1	93.7	96.9	87.8	93.1	91.4
OL2	93.3	92.7	94.3	81.3	94.6
Investments (M€)	56 (***)	369	181	299	265
OL1/OL2 combined production cost (€/MWh) (*)	17	15	20	21	20
Average market price (€/MWh) (**)	28.0	44.0	46.8	33.2	32.5
OL1/OL2 value creation for shareholders (M€)	160	427	377	166	180

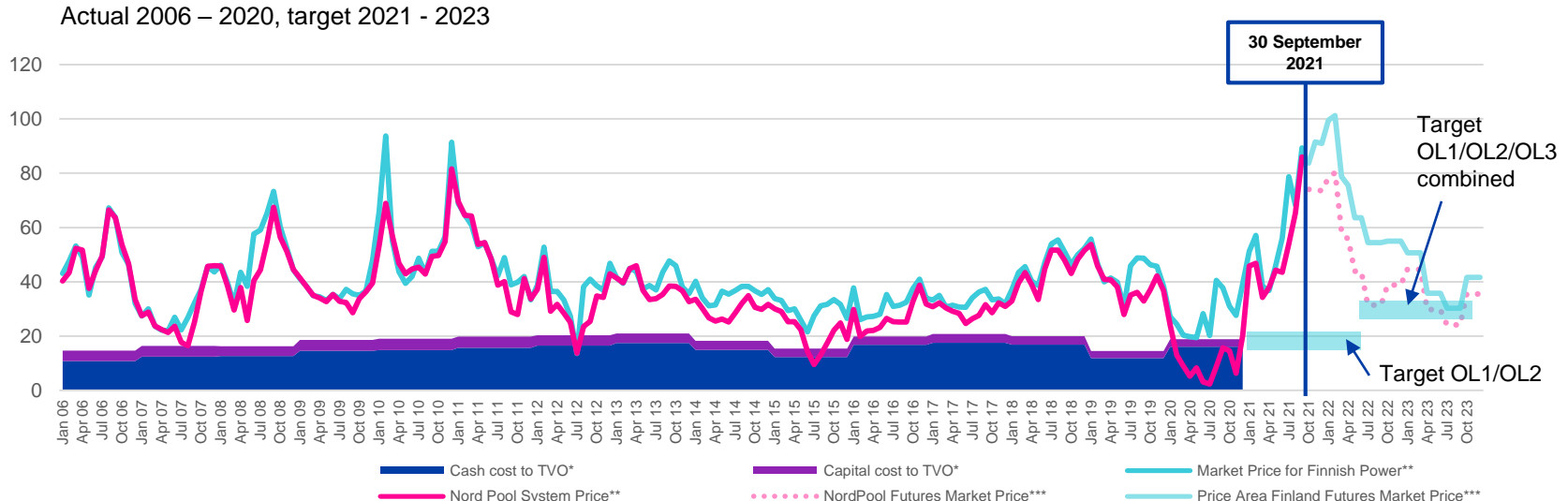
*) Including electricity transmission costs, rounded to nearest Integer. Source: TVO annual reports

**) Annual Nordpool weighted average of Finnish base load daily prices

***) Net of OL3 capex and GSA penalties

TVO CREATES VALUE TO OWNERS BY PRODUCING STABLE AND LOW COST POWER

TVO's historical cost of nuclear power has been stable and below the market price



*) Source: TVO annual reports

**) Source: www.nordpoolspot.com

***) Source: www.nasdaqomx.com, 5 October 2021



SUSTAINABILITY

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**Production of
climate-friendly
electricity**

**Sustainable
land use**

**Storage and
handling
of hazardous
or harmful
substances**

**TVO has identified the
following significant
environmental and
energy aspects of its
operations**

**Spent nuclear
fuel generated
during operations**

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

**Thermal load on
the sea caused by
cooling water**

**A radioactive
release into the
environment
during a severe
accident**

SUSTAINABILITY AT THE CORE

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Source: TVO Environmental Report 2020, found at
<https://www.tvo.fi/en/index/investors/financialpublications.html>



SUSTAINABLE DEVELOPMENT GOALS AT TVO

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- TVO is committed to supporting the emission reduction targets set out in the Paris Agreement through the production of climate-friendly nuclear electricity in a safe and competitive manner
- TVO promotes the following United Nations' Sustainable Development Goals (SDGs) in its operations:



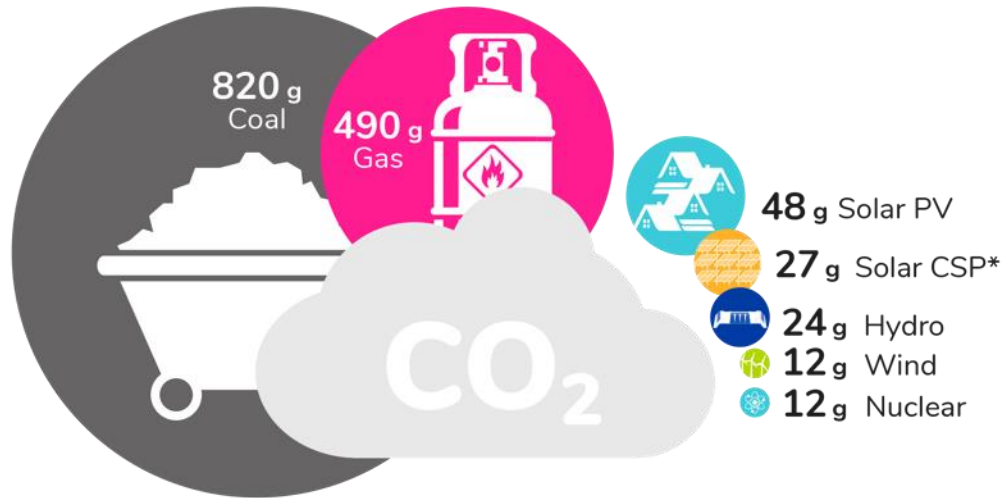
- TVO's sustainability strategy focuses on the development of the SDGs together with TVO's corresponding **material sustainability aspects**:
 - The production of climate-friendly electricity for society
 - An uncompromising safety culture
 - Creating added economic value
 - The well-being of employees and strong networks
 - High-class nuclear and final disposal expertise

EU TAXONOMY - JOINT RESEARCH CENTER REPORT

- The European Commission continues taxonomy criteria preparations for EU's Sustainable Finance. The Commission's Joint Research Center (JRC) completed its report on the **taxonomy eligibility of nuclear power** in March 2021.
- The JRC's report does not find scientific grounds for excluding nuclear power from the Sustainable Finance Taxonomy. **The report states that nuclear power does not cause any more harm to people's health or the environment than other electricity production methods which are already included in the Taxonomy.**
- The JRC's report confirms that **the emissions of nuclear power during its lifecycle are comparable to those of solar, hydro and wind power.**
- The report reviews all stages of the lifecycle of nuclear fuel, and states based on scientific analysis that appropriately carried out and supervised storage or final disposal of spent **nuclear fuel does not cause significant harm** to people's health or the environment.
- The final decision on the taxonomy eligibility of nuclear power is **expected** to be taken by the Commission **at the end of 2021.**

CO₂ EMISSIONS OF DIFFERENT PRODUCTION MODES DURING THEIR LIFECYCLE

Amount of carbon dioxide produced per 1 kWh of energy underlines the sustainability considerations regarding nuclear:



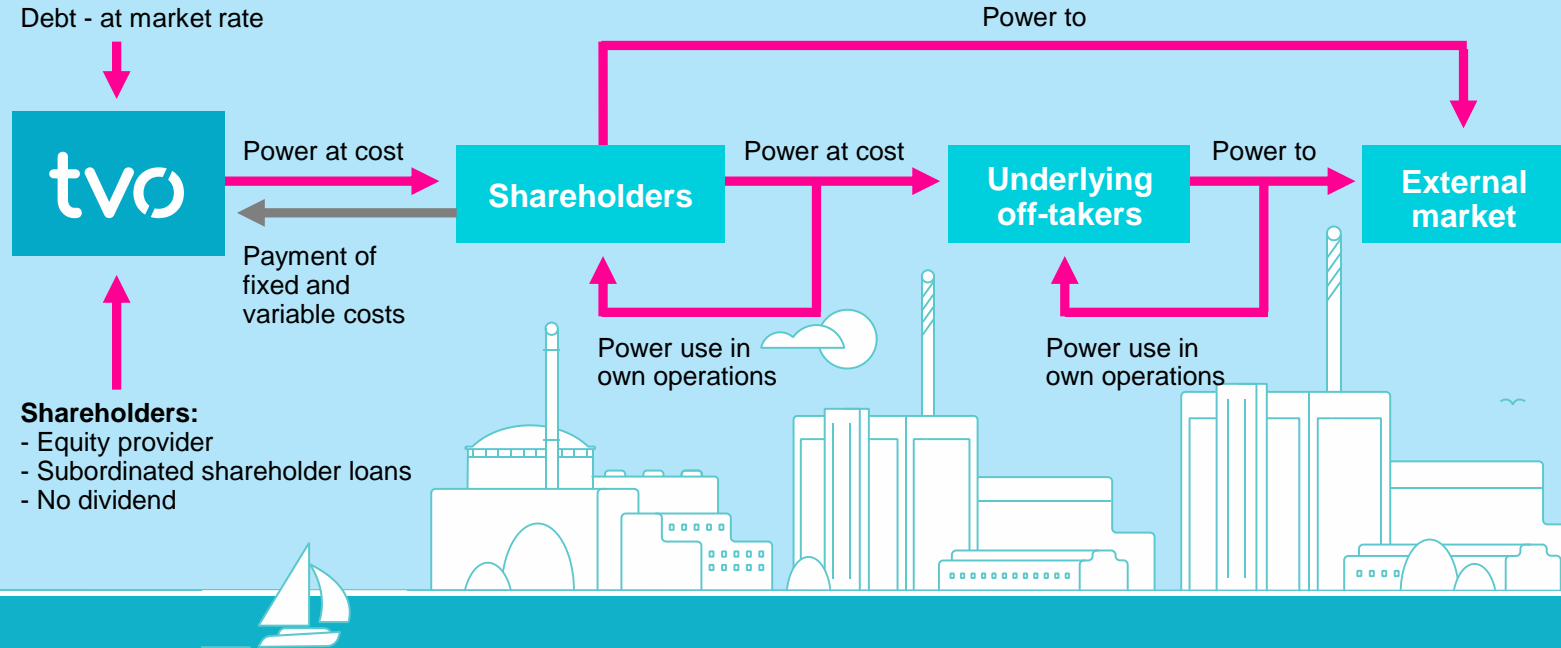


OPERATING MODEL OF TVO

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TVO'S OPERATING MODEL

Mankala model benefits both TVO as well as its shareholders and off-takers



TVO'S OPERATING MODEL



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- TVO is run according to the **Mankala Principle**, which is a unique model widely applied in the Finnish energy industry
 - Different share classes give access to the output of TVO's different assets proportionally to a shareholder's stake
 - TVO invoices fixed costs one month in advance, minimising its liquidity and working capital needs, variable costs are invoiced monthly based on electricity consumed by each shareholder
- Shareholders are **severally responsible** for the annual costs of the respective asset as **defined in the articles of association** of TVO
 - TVO is a limited liability company and its shareholders have no personal liability for the indebtedness of TVO
 - The shareholders are not liable for any other costs than defined in the articles of association, unless otherwise agreed in writing
 - Only the company has the sole right to call upon the responsibility of the shareholders
- In the event a shareholder does not make its payments, TVO has the right to sell the non-paying shareholder's electricity to other shareholders or to third parties at market price
- Existing shareholders have a right of first refusal to buy shares that may be offered for sale



ELECTRICITY MARKET IN FINLAND

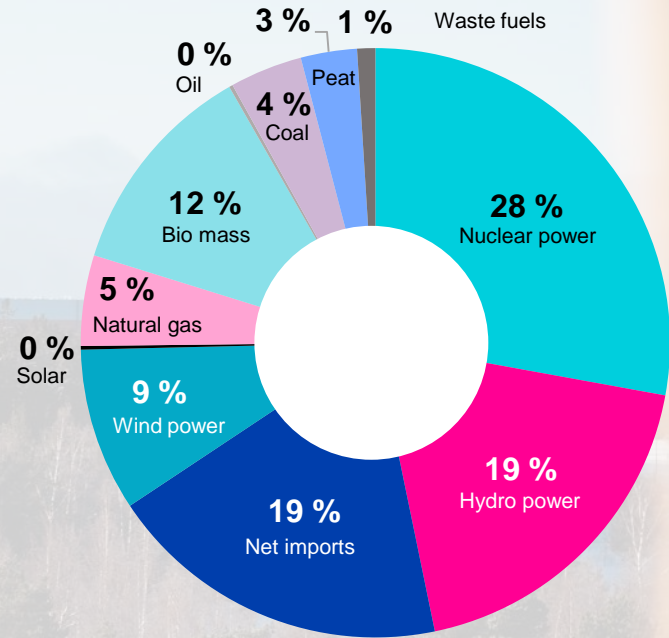
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ELECTRICITY SUPPLY

by energy sources 2020 (81 TWh)



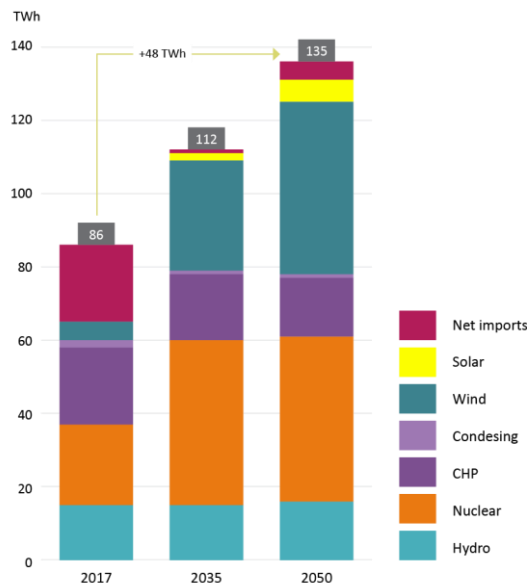
Balanced sources of production, but the high share of imports implies scarcity and need for further production capacity



EMISSION-FREE ELECTRICITY IN FOCUS IN FINLAND

Scenario of strong electrification, Finnish Energy

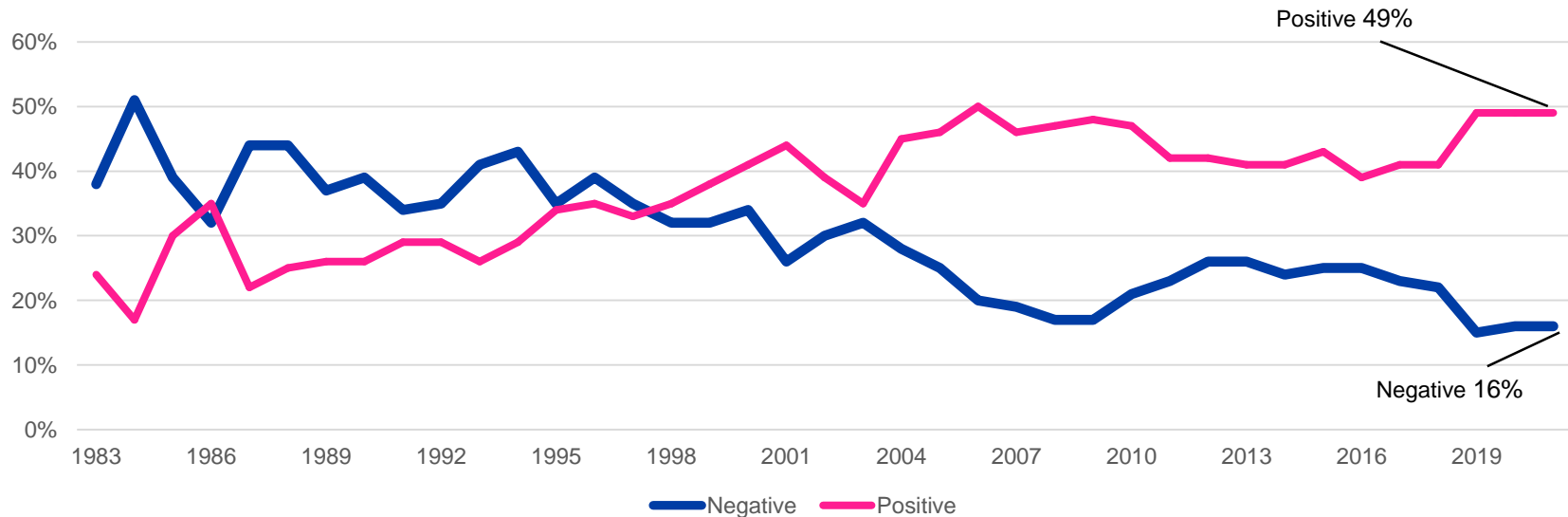
The energy sector is meeting the growing demand for electricity on market terms. Steering of emissions trading safeguards investments in cleaner electricity generation.



- The expansion and strengthening of emissions trading is the most important instrument for beyond 2030.
- No need for instruments that overlap with emissions trading, for example, those based on national taxation.
- Functioning of the electricity market must be promoted with pan-European legislation.
- Public funding must be aimed at energy demonstration and pilot projects, energy production does not need funding.

DEVELOPMENT OF NUCLEAR POWER ACCEPTANCE, FINLAND, 1983 - 2021

Public support exists for nuclear power





OL1 AND OL2

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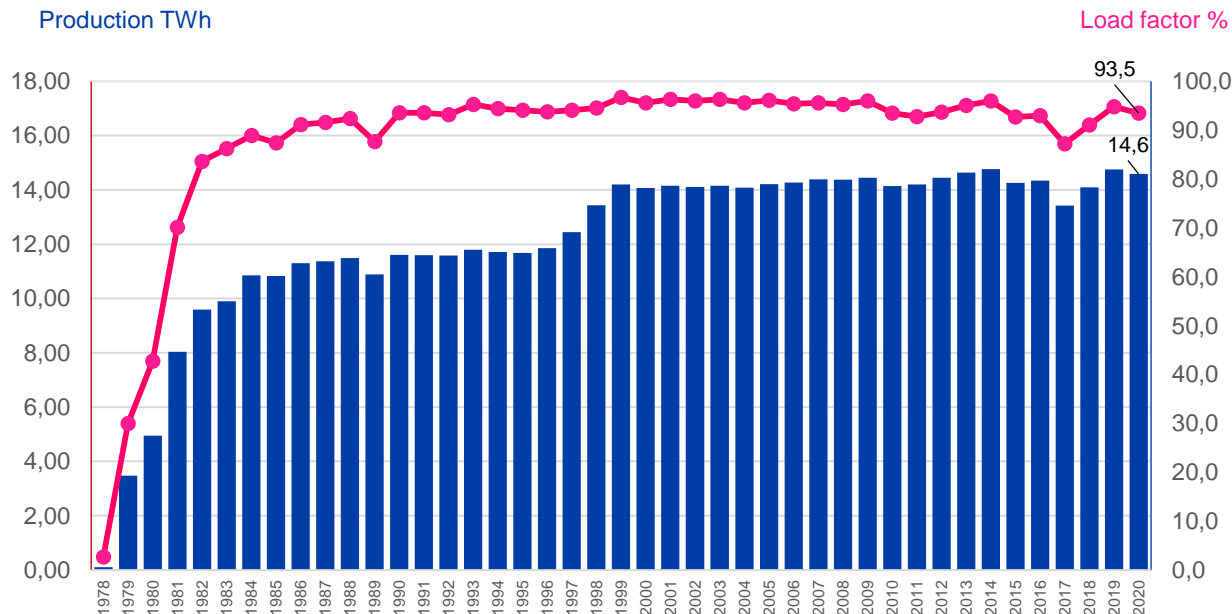
OL1 AND OL2 PRINCIPLES FOR DEVELOPMENT

- Long-term capacity factors rank among the global top
- Annual combined production over 14 TWh
- Plant units continually maintained and developed to improve the reliability and safety of the units, for example;
 - Completion of replacement of the main circulation pumps in 2018
 - Replacement of emergency diesel generators for OL1 and OL2 ongoing
 - 1. unit installed in July 2020
- In **September 2018**, the Finnish Government approved the extension of the operating license until 2038



STRONG TRACK RECORD OF OL1 AND OL2

- OL1 and OL2 plants have regularly achieved load factors among the highest within their global peer group
- High load factors indicate stability and safety of operations
- Consistently (>20 years) high stability also spreads fixed costs over a maximum volume of output





OL3 EPR PROJECT

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OL3 EPR SCHEDULE

- Operating license granted March 2019
- Fuel Loading in March 2021, completed
 - Hot Functional Tests halted due to turbine overhaul and inspection works
- Expected start of electricity production in Feb 2022
- Scheduled start of regular electricity production and subsequent Provisional Take Over (PTO) expected in Jun 2022



REACTOR ISLAND: TECHNICAL PROBLEMS RESOLVED

Technical issues :

- Pressurizer surge line vibration solved, has been tested in Hot Functional Test 2.
- New pressurizer safety valves' spring loaded pilot control valves installed
- Emergency diesel generators repair done
- Faulty cable insulation in automation cabinets has been repaired

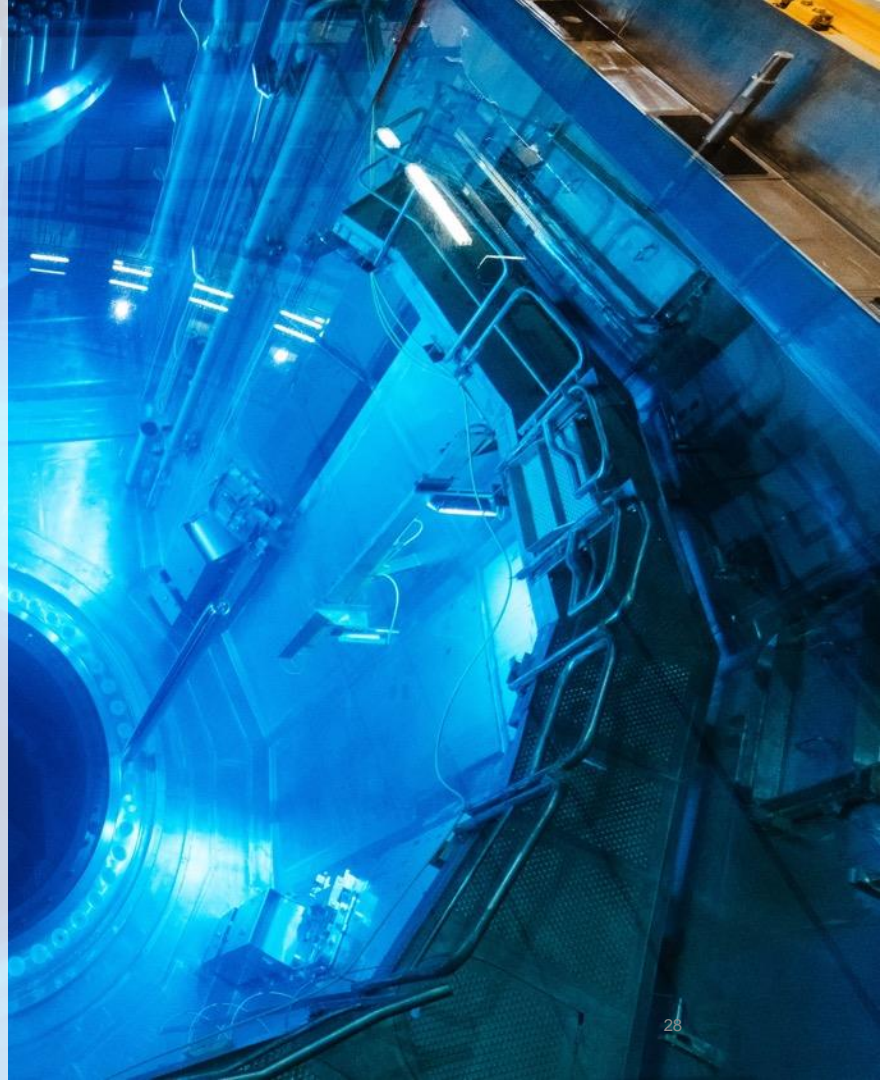
TURBINE ISLAND:

- In July 2021, based on test results from the hot functional tests, the plant supplier decided to conduct still some overhaul and inspection works for the turbine.
 - As a result, the regular electricity production of the OL3 EPR plant unit was postponed for a month
- Furthermore in August 2021, during the turbine inspection works, the plant supplier decided to extend the overhaul to all three low-pressure turbines in order to perform further inspections on them.
 - The plant supplier informed that the regular electricity production of the OL3 EPR plant unit will be further postponed for three months



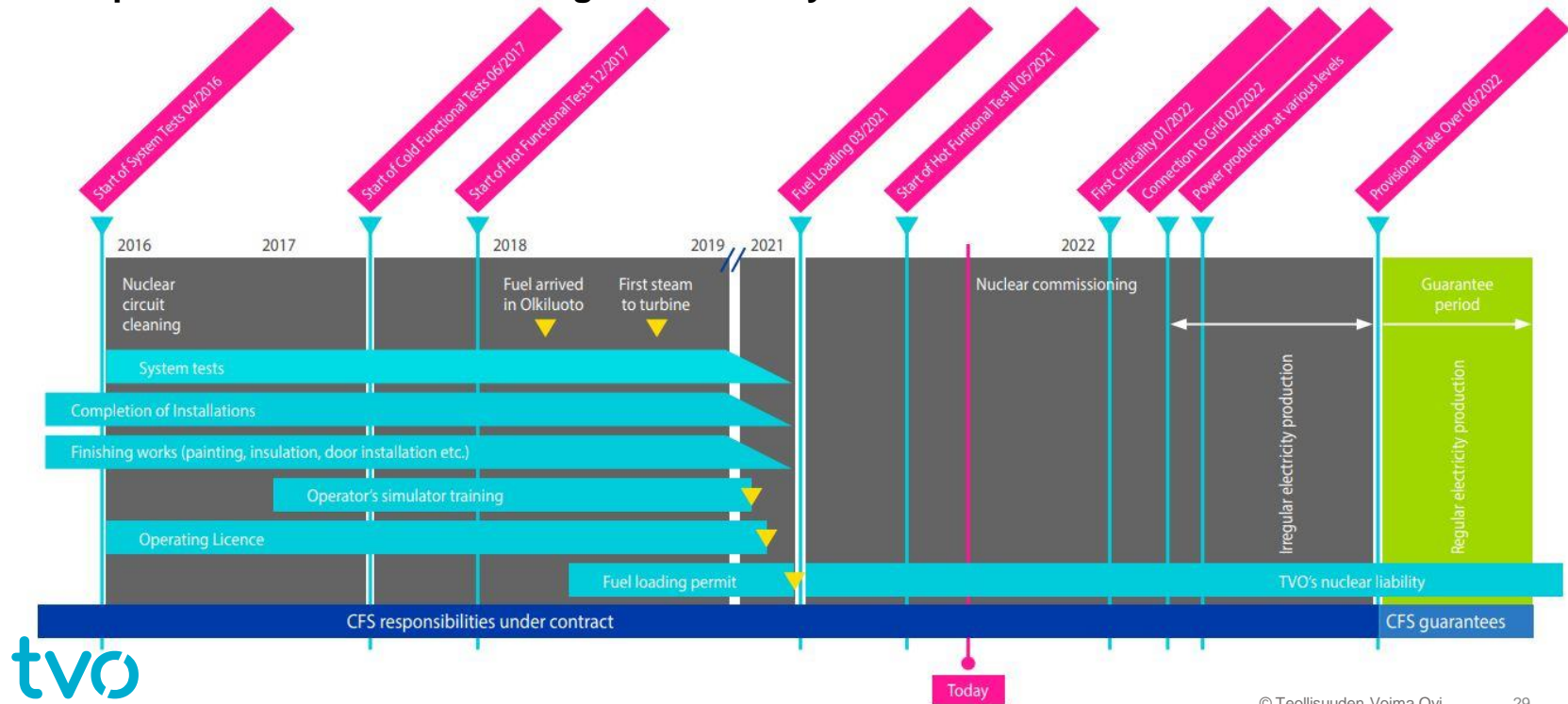
TOWARDS ELECTRICITY PRODUCTION

- Last stages of the hot functional tests will be carried out after completing turbine overhaul and inspection works
- Start-up of the reactor (first criticality)
- Regular maintenance work and periodic tests will continue



OVERVIEW OF OL3 PROJECT, September 2021

Power production scheduled to begin in February 2022





AMENDMENT TO OL3 EPR SETTLEMENT AGREEMENT

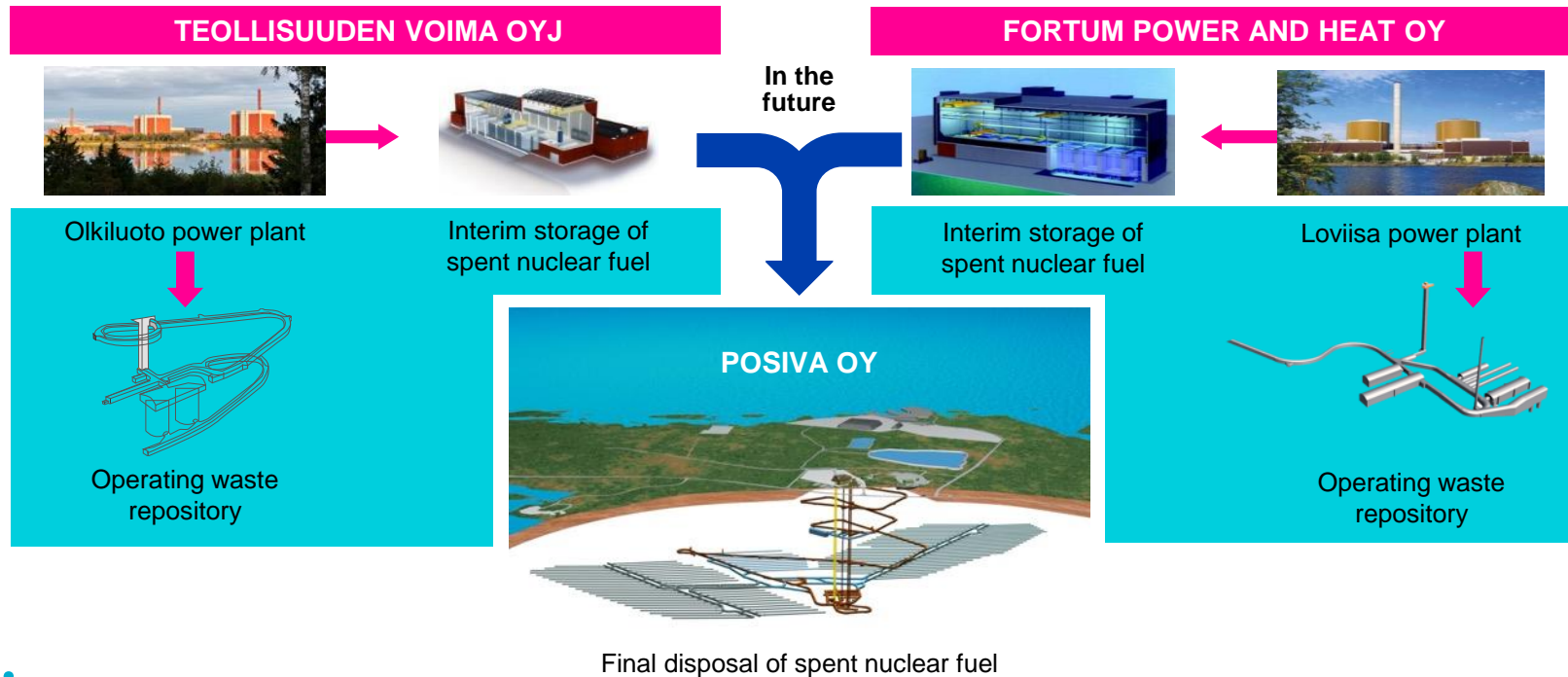
- **Amendment** to the Global Settlement Agreement (GSA) in 2018 **signed in June 2021** enters into force after certain conditions have been fulfilled
- The Areva companies' **trust mechanism**, established in GSA **remains** and **has been further replenished** by Areva with approximately **EUR 600 million** as of the beginning of January 2021
- The **parties are to cover their own costs** for the period **between July 2021 and 28 February 2022**
- In the event that OL3 EPR project is not completed by the end of February 2022, the **Supplier shall pay to TVO an additional delay compensation** until 30 September 2022. The amount of the additional compensation depends on the actual completion date of the project and in any case is **limited to a maximum of EUR 56.7 million**
- The penalty **amount of EUR 400 million** agreed in the GSA 2018, **paid in two instalments**: approximately EUR 200 million has been executed in **connection with the GSA amendment becoming effective** and the remaining approximately EUR 200 million **when OL3 EPR regular electricity production is to start** or by end of September 2022 at the latest
- The **turnkey principle** of the OL3 EPR plant contract and the joint and several liability of the supplier consortium companies **remains in full force**



NUCLEAR WASTE MANAGEMENT

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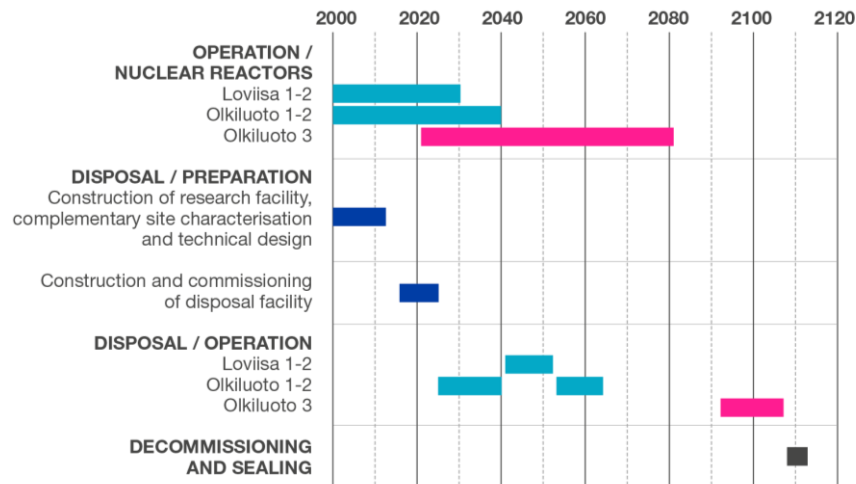
IMPLEMENTATION OF SPENT FUEL DISPOSAL



SPENT FUEL DISPOSAL AND ITS TIMETABLE

- Unlike most other nuclear power producing countries, Finland has made a political decision about the final disposal of spent fuel and nuclear waste - Olkiluoto was selected as the site for this purpose
- Funds have been collected for future costs out of the price for nuclear electricity to the State Nuclear Waste Management Fund
- Work is in progress to build an underground rock characterisation facility which will be part of the final storage; costs are covered by the price for nuclear electricity
- Posiva was granted construction licence for the final disposal facility of spent nuclear fuel in **November 2015**
- The Radiation and Nuclear Safety Authority in Finland (STUK) has concluded in the decision it issued on **November 2016**, that Posiva is in the position to start the construction of the final disposal facility
- Excavation works for the first tunnels for the final disposal facility started in **December 2016** - In **May 2021**, Posiva announced it started the excavation of the actual final disposal tunnels, where the spent nuclear fuel will be stored

Schedule of spent fuel disposal



SCHEDULE FOR FINAL DISPOSAL OF SF



ALL NECESSARY NUCLEAR WASTE MANAGEMENT IN OLKILUOTO

Spent fuel interim storage facility

Cooling of fuel assemblies removed from the reactor building in water pools excavated in rock

Decommissioning waste repository

Space reservation for decommissioning waste

Operating waste repository – VLJ

Final disposal of intermediate and low level waste

Spent nuclear fuel repository

The underground research facility ONKALO®

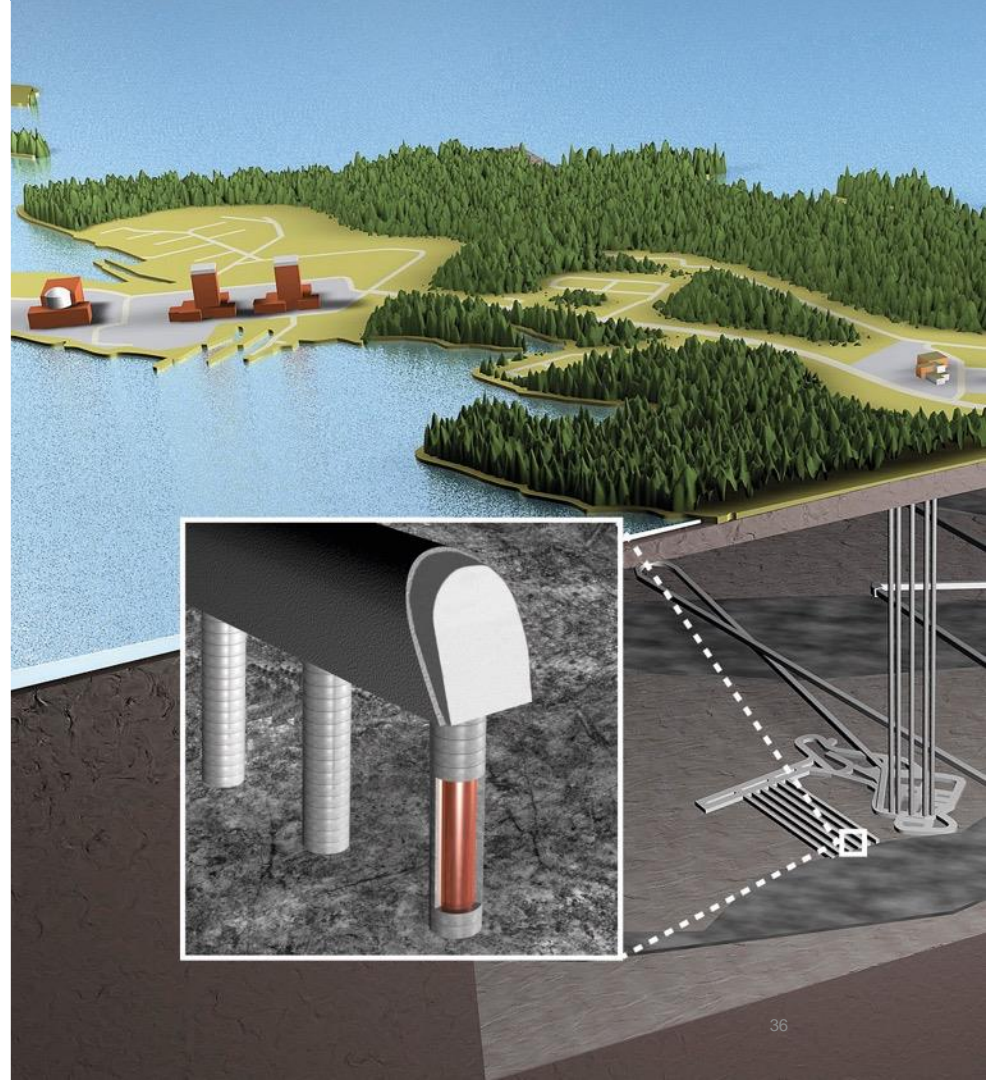
FINANCING OF NUCLEAR WASTE MANAGEMENT

The Finnish State Nuclear Waste Management Fund

- A guarantee fund towards all future nuclear waste management costs
- The Finnish Government assesses annually TVO's liability for future nuclear waste management costs as well as the funding target
- TVO's contribution is assessed by the Fund

Financing of the Fund

- TVO's annual operational costs as well as share of Posiva's costs are charged in the annual electricity cost
- The annual incremental increase of the Fund's resources is covered by earned interest of the fund and TVO's waste management contribution to the Fund
- According to current legislation, TVO and its shareholders are allowed to borrow back 75% of the fund balance and the residual 25% remains with the Government
- According to new legislation, applicable 2022, company borrowing is limited to 60% of the fund balance and broader investments are allowed





FINANCING UPDATE

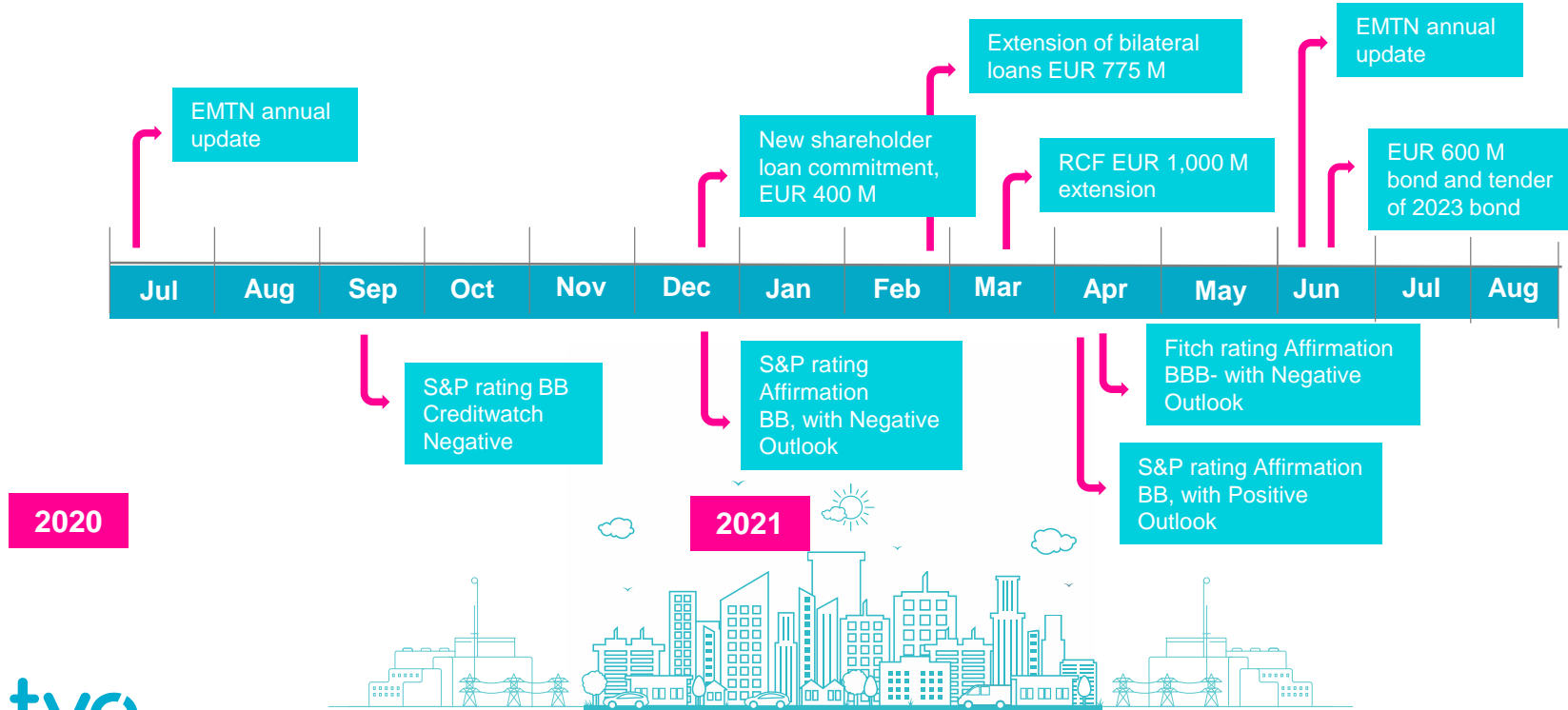
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FINANCIAL SITUATION DEVELOPING AS PLANNED, LIQUIDITY REMAINS STRONG

- The long-term goal of the Company is to maintain an equity ratio of at least 25 percent (32,4% at the end of Q3 2021 with a covenant level at 25%)
- TVO operates in both the domestic money market and the international capital markets
 - EUR 4.0 billion Euro Medium Term Note programme (EMTN) listed on the Luxembourg Stock Exchange
 - EUR 1.0 billion domestic commercial paper programme
- Credit facilities
 - EUR 1.0 billion of the syndicated revolving credit facility, maturing June 2024
 - EUR 400 million subordinated shareholder loan commitment

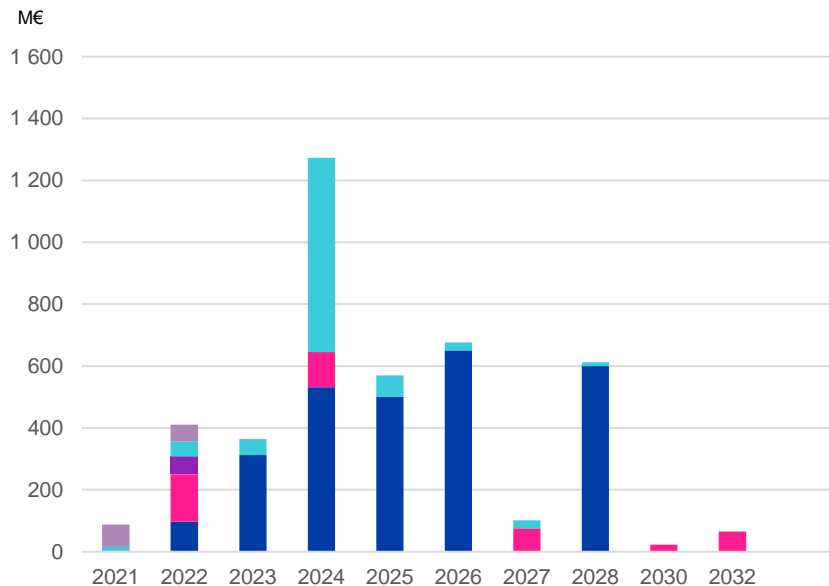
Credit ratings			
	Long-term	Short-term	Outlook
SP Global Ratings	BB	A-3	Positive
Fitch Ratings	BBB-	F3	Negative
Japan Credit Rating Agency	A+	-	Negative

TVO'S RECENT FINANCIAL ACTIVITIES



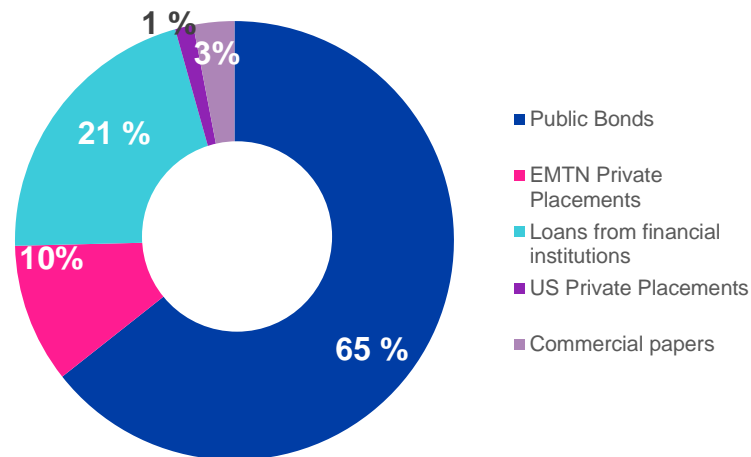
DEBT MATURITY PROFILE, GROUP

Diversification of sources and maturities visible



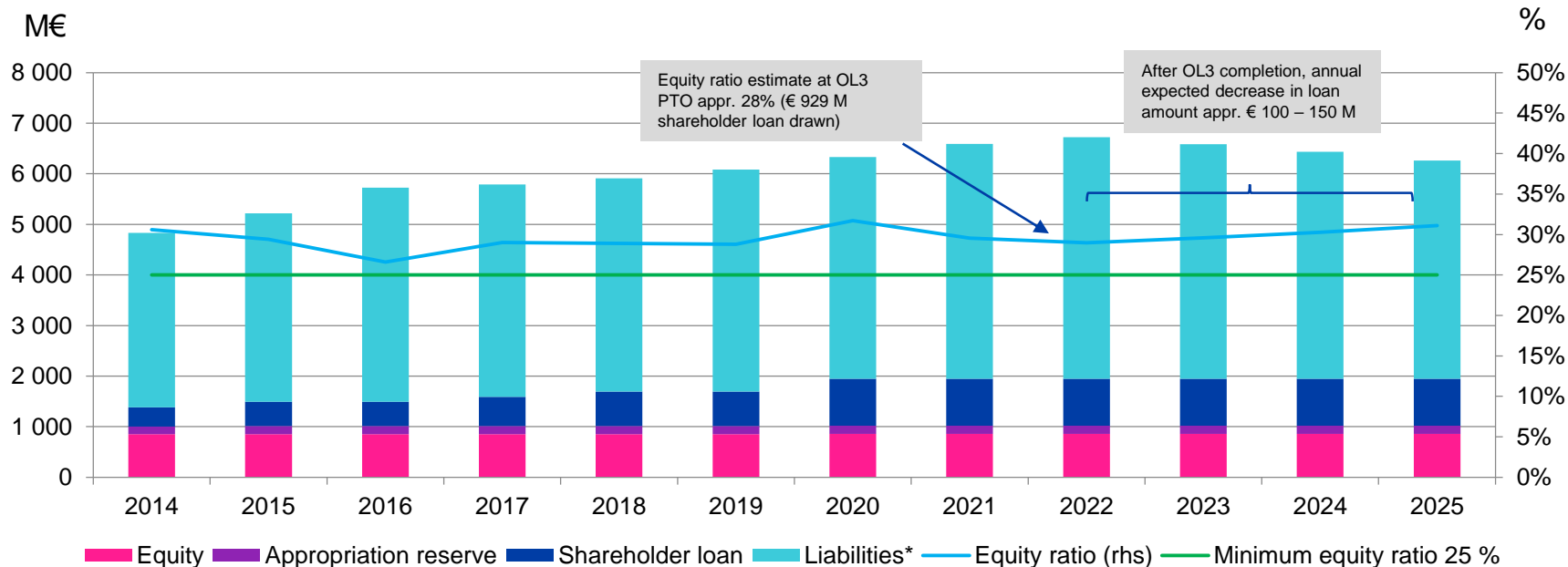
Debt structure 30.9.2021
Loan amount € 4,182 M

In addition, the Group has subordinated shareholder loans (hybrid equity) totaling € 929 M.



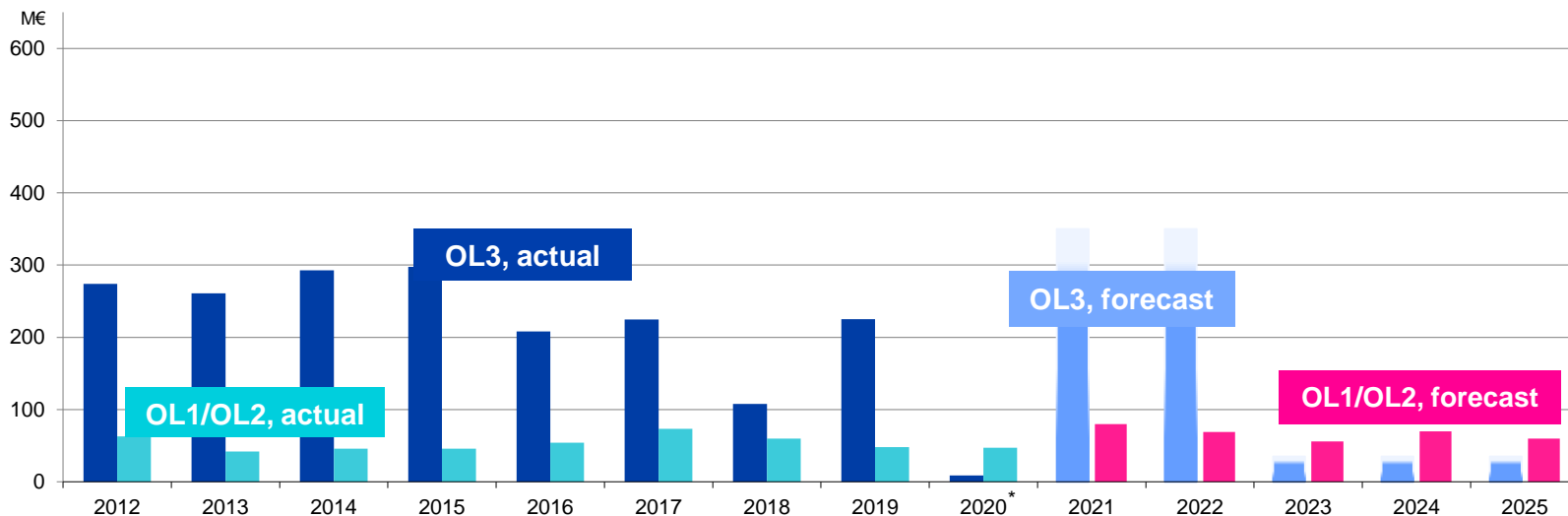
TVO BALANCE SHEET AND EQUITY RATIO (FAS), ILLUSTRATIVE

(OL3 EPR commercial operation, scheduled to start in June 2022)



CAPEX PROGRAM OL1/OL2/OL3

Capex expected to be more moderate in the years to come upon the completion of OL3



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