

New nuclear in the power system

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Fortum is a strong Nordic nuclear operator

Key figures 2023

Nuclear generation **24.8 TWh**
 Total nuclear capacity **3.2 GW**
 Share of Fortum's total power generation **53%**
 Nuclear professionals **~750**

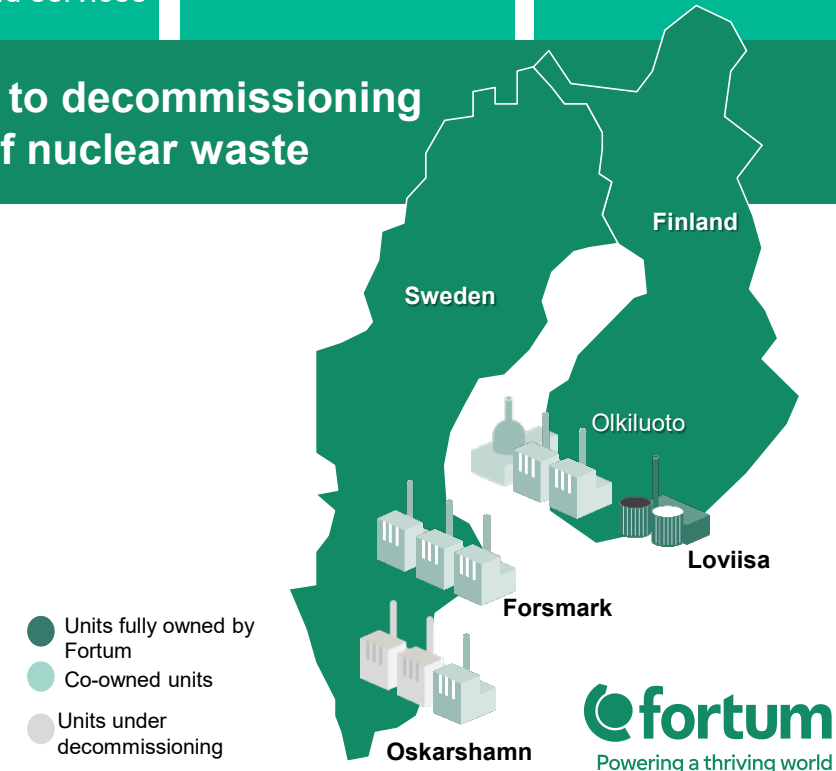
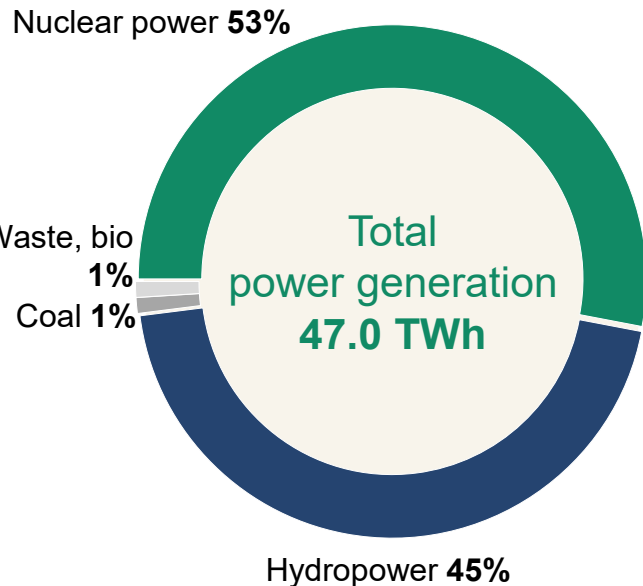
We have 40+ years' track record of safe nuclear operations and we are forerunners in responsible waste management

- Fully-owned nuclear power plant in Loviisa, Finland
- Co-owned nuclear power plants in Finland and Sweden
- Nuclear services provider with innovative products and services
- New Nuclear Feasibility Study in Finland and Sweden
- In-house engineering and project competences

Expertise from new build to decommissioning and final disposal of nuclear waste

Unit	Mwe (net)	Fortum Share %
Loviisa 1 Loviisa 2	507 507	100 100
Olkiluoto 1 Olkiluoto 2 Olkiluoto 3	890 890 1600	26.6 26.6 25
Forsmark 1 Forsmark 2 Forsmark 3	988 1120 1172	23.4 23.4 20.1
Oskarshamn 3 Oskarshamn 1 Oskarshamn 2	1400 decom decom	43.4 43.4 43.4

Fortum's power generation in 2023



Feasibility study on new nuclear

Our goal is to enable decarbonization in the Nordics and to explore the preconditions for growth in new nuclear in active dialogue with different stakeholders

During the two-year study, we explore:

- commercial, technological, and societal, including political, legal, and regulatory conditions
- both for small modular reactors (SMRs) and conventional large reactors in Finland and Sweden.

The study also investigates new partnerships as well as new innovative business models

As part of the study, we have made several cooperation agreements with vendors and customers

The study will be completed by the end of 2024

New partnerships and innovative business models

Large reactors and small modular reactors (SMRs)

Sweden and Finland

Cooperation agreements with vendors and customers

Technological and commercial preconditions

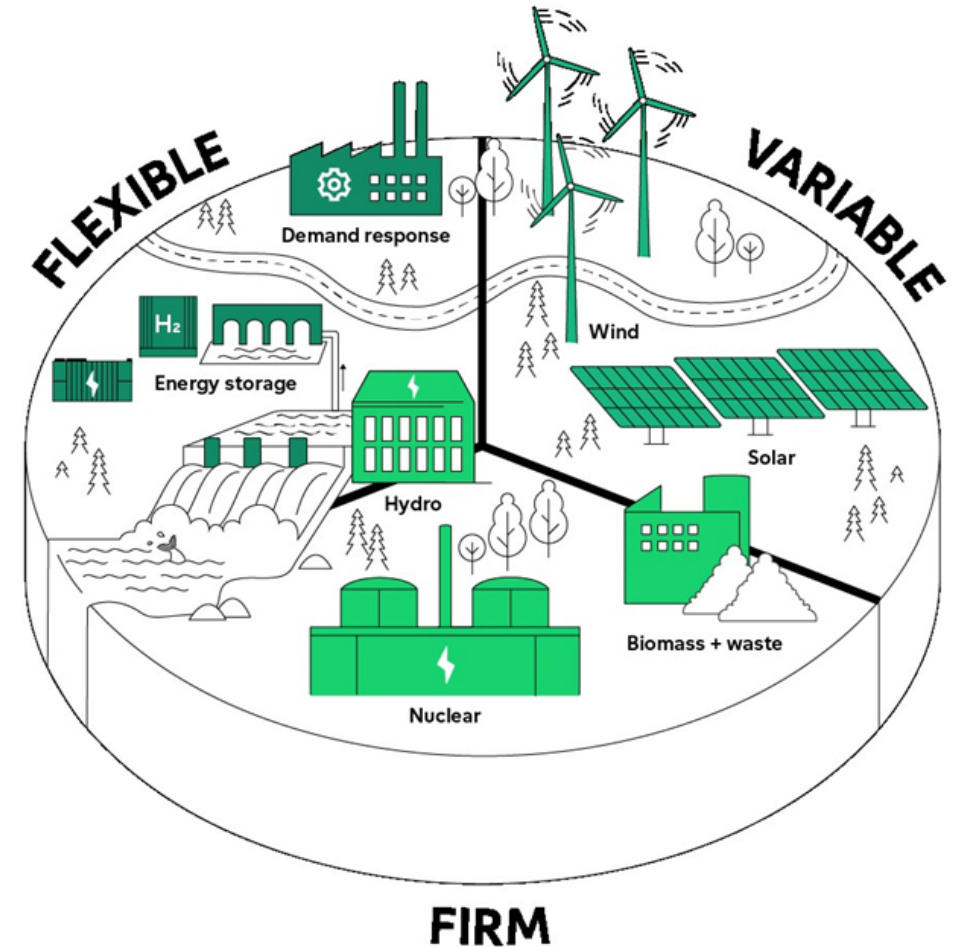
Why nuclear is needed in the electricity system

To reach our climate targets, nuclear power provides **CO₂-free electricity** power production at scale

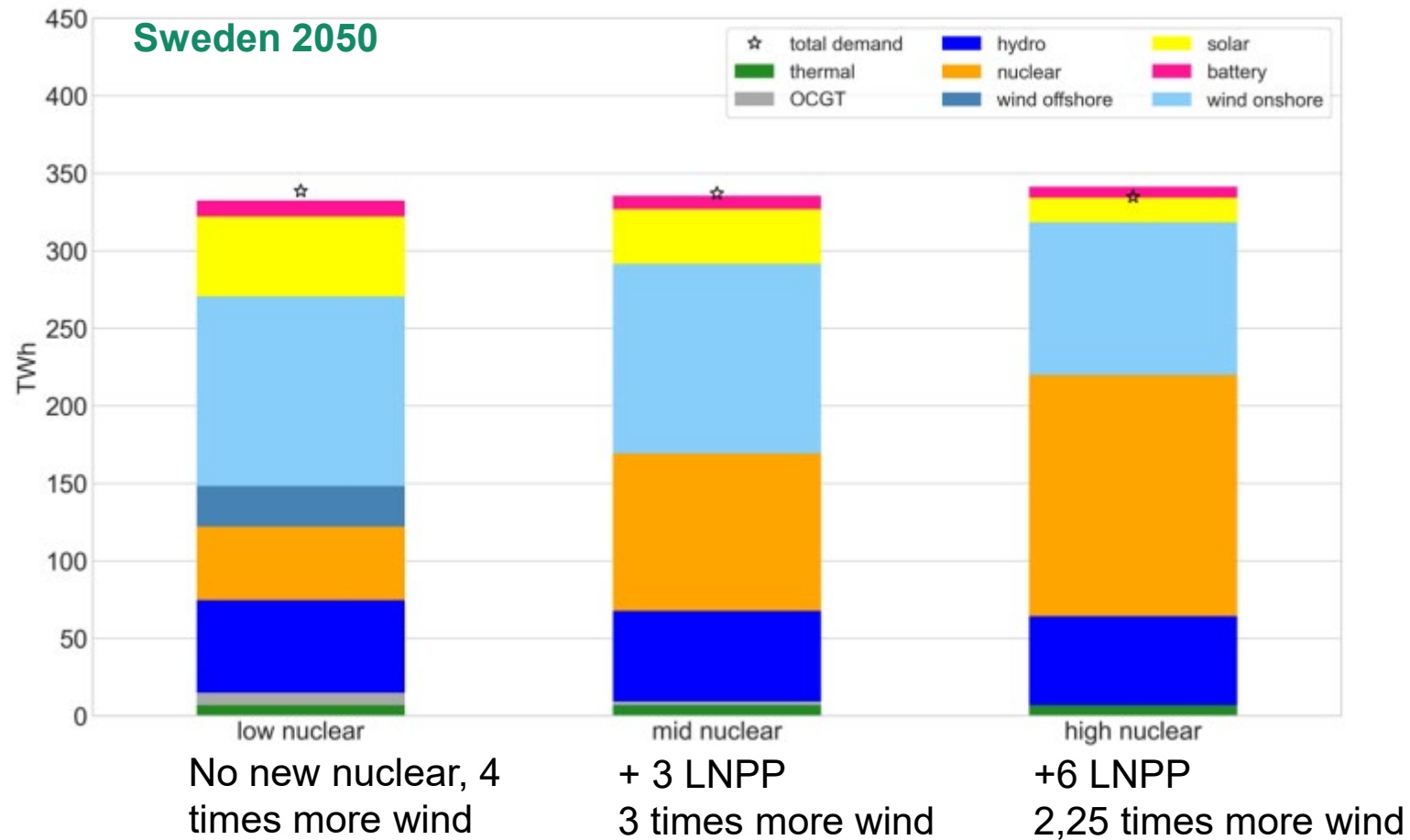
Nuclear power provides **national security of supply**, given a sufficiently diversified fuel supply

Nuclear power provides **stability to the grid**, through e.g. inertia and frequency regulation

Nuclear power provides a **stable production** profile, requested by large industrial customers



Study on the most cost efficient and robust Finnish-Swedish electricity system. 3 modelled scenarios for 2035 and 2050



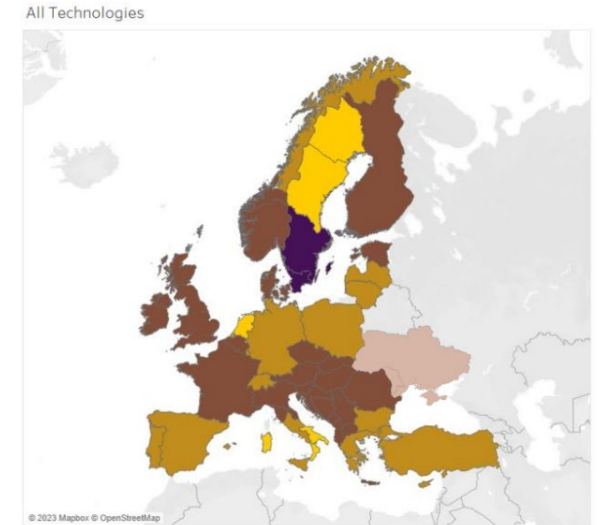
A balanced system results in lower electricity prices, lower volatility, higher security of supply and lower use of resources

Parameter	Year	Nuclear share	
		Low (existing nuclear)	High (+new nuclear)
Electricity price level (median)	2035	62 €/MWh	57 €/MWh
	2050	72 €/MWh	52 €/MWh
Electricity price volatility compared to historic average ⁶⁰	2035	Similar	
	2050	Higher	Similar
Security of supply		Increased sensitivity	More robust
Annual system cost (B€) ⁶¹	2035	14	14
	2050	19	19
Life-cycle greenhouse gas emissions (gCO ₂ /kWh) ⁶²	2035	16-23	14-17
	2050	20-31	14-17
Land use (km ²) ⁶³	2035	1900	1600
	2050	3600	2300
Use of critical minerals (Mt) ⁶⁴	2035	0.7	0.6
	2050	1.4	1.0

There is need for new firm capacity in southern Sweden, both today and for future electrification!

- Swedish TSO Svenska kraftnät:
 - From a big picture perspective for the electricity system, flexibility and storage in combination with variable electricity production will not be enough. We will also need new firm capacity in the system. Source: [Systemutvecklingsplan 2022-2031](#)
- Swedish Energy Agency:
 - “To manage an extensive electrification, we will need all fossil free electricity production technologies”. Source: [Långsiktiga scenarier](#)
- Southern Sweden has adequacy challenges →

Conclusion: We need new firm, fossil free production in southern Sweden at scale. Nuclear is the best solution we have at hand.



Net generating capacities compared to highest expected demand in winter 2023/24. Source: *ENTSO-E*

Elområde	Förbrukningsansökningar, total volym [MW]
SE1	12 500
SE2	3 700
SE3	4 300
SE4	0
Totalt	20 500

Requests for new consumption in Sweden. Source: *Svenska Kraftnät*

Thank you!

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