

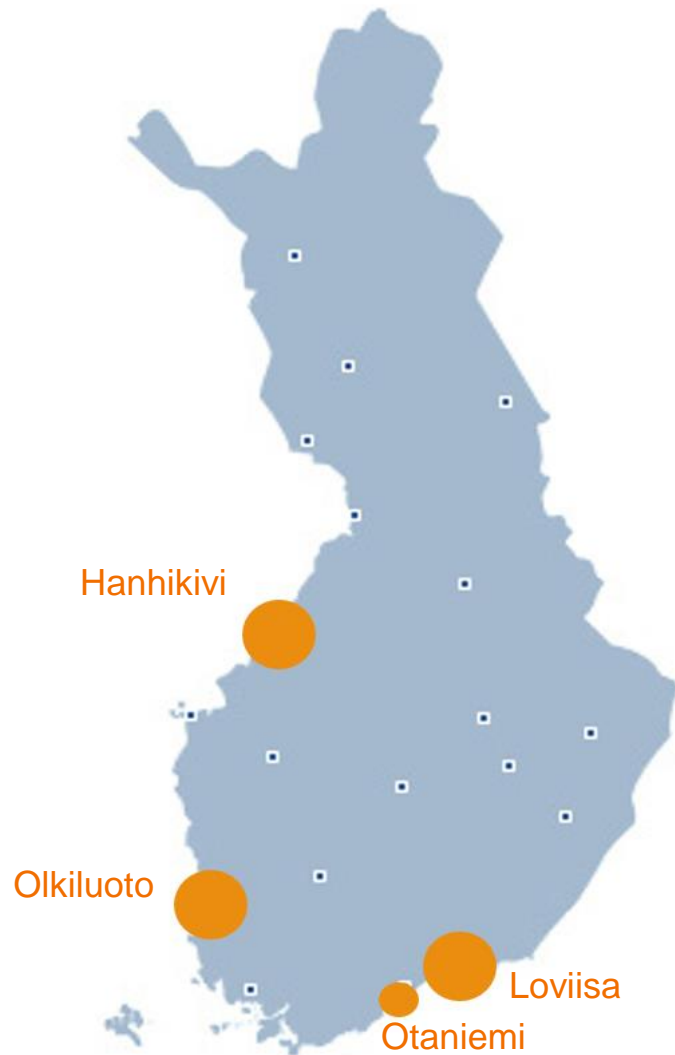
Nuclear Energy in Finland

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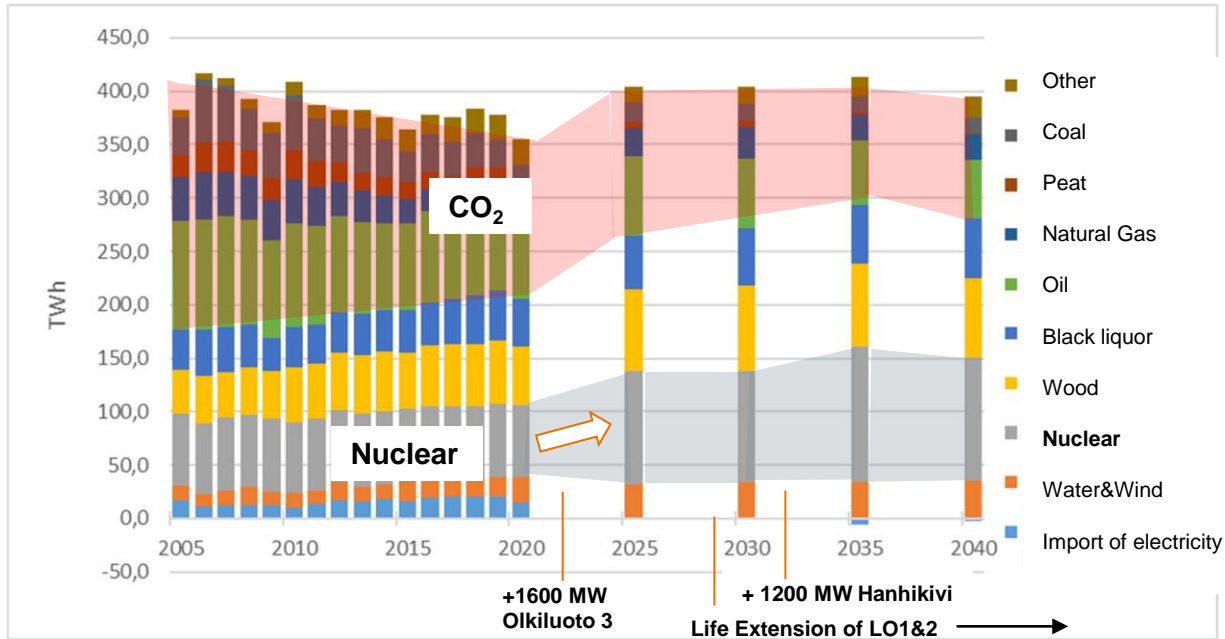
06/05/2022 VTT – beyond the obvious

Nuclear in Finland 2022



- **Loviisa**
2 x VVER-440 500+ MW
- **Olkiluoto**
2 x BWR 890 MW
ONKALO
EPR 1600 MW
- **Hanhikivi**
VVER-1200 (prepare for CL)
- **Otaniemi (VTT)**
FiR1 TRIGA (decom)

Primary energy production – scenario for 2040

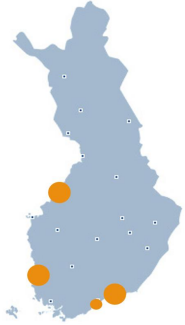


Source: Finnish climate and energy strategy (under request for opinion VN/11385/2020)

Investment into new technologies (SMR) is mentioned in strategy.

Coal and peat replacement with nuclear is recognized for heat energy sector.

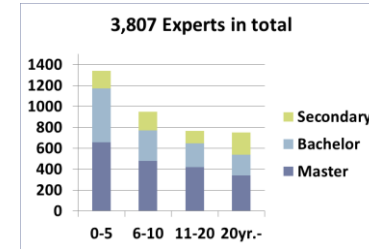
Nuclear future in Finland



Gas & Coal prices have 4-folded in EU in 2 yrs



~3800 experts in Finland (2017)



Dramatic change on market impact business cases – investment of nuclear even more attractive ?

SMR technologies : Supply & Demand under development:

- SMR for electricity - Potentially competitive vendor designs available. Technical readiness exist at Finnish utilities
- SMR for heating - Finnish innovations under design, no vendor yet – demand emerging within heat endusers, especially district heating in cities.
- SMR for CHP – new opportunity, some plant vendors add flexibility via modular solution.

True opportunities exist thanks to Finnish **competence** and **solution** for total nuclear waste management

Regulators assumed to work effectively within EU for safety assessment of new plant types and renew legislation to take benefit of SMR

How VTT supports Nuclear Energy sector

Staff

200+ researches (**131** at Nuclear Energy research area)

30% hold PhD or Lic.Tech. degree

Role

Research & Development & Innovation

- Facilities, Software products, Multitechnology expertise

TSO (Technical Support Organization)

- Support for Regulator, Licensee, domestic and Internationally

Human Capacity Building, Competence development

- National program, learn by doing

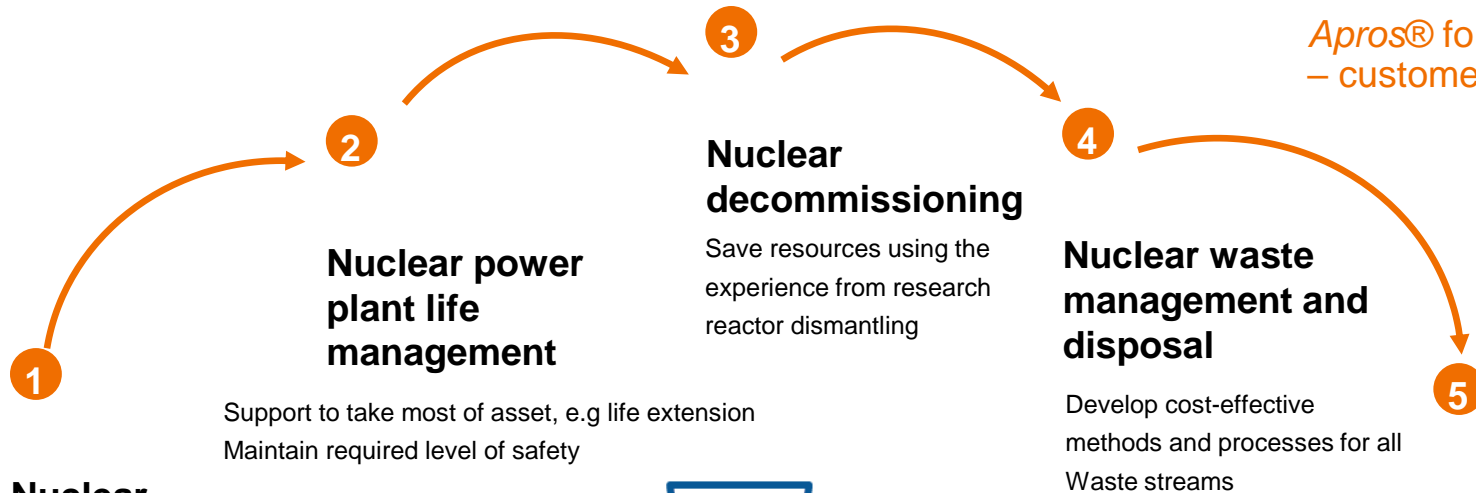
Co-ordinator of all Nuclear Energy related ecosystems in Finland



Customers

~50 customers: Utilities, Vendors, Regulators, Nuclear waste management companies, Governments

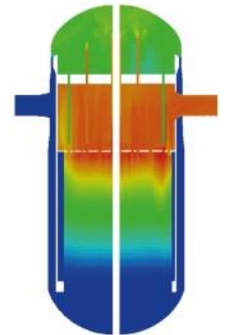
Services to the nuclear sector globally



In-house code:

Serpent for reactor physics
– customers in 60 countries

Apros® for process simulations
– customers in 30 countries



Future of nuclear

Innovations – eg. District heating reactor
Economics of SMR
Advance business through ecosystems

We always aim for impact

Thank You