

Sustainable final disposal of spent nuclear fuel in Finland

Nuclear Energy, Climate Change & Sustainable Development: Developments in Europe.

22 October, 2021

Posiva Oy



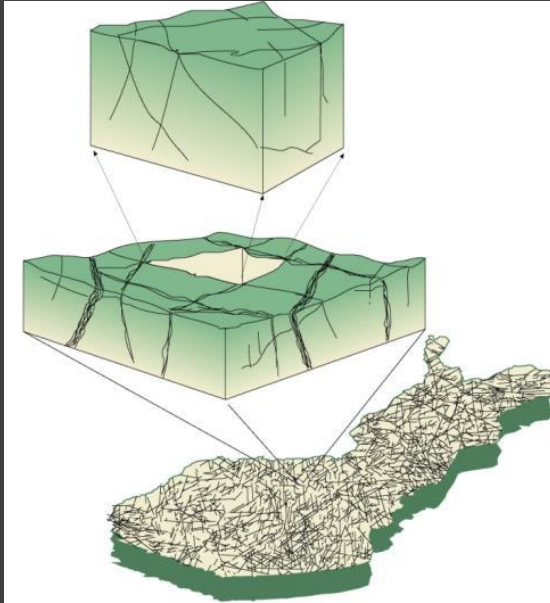
- Mission: safe and cost efficient final disposal of spent nuclear fuel of its owners
- Owners: Teollisuuden Voima Plc and Fortum Plc
- 90 employees
 - in addition, 100 external person years and 150 construction workers
- Turnover EUR 113 million (2020)
- Subsidiary Posiva Solutions (est. 2016) sells expertise on the final disposal of SNF

The safe final disposal will be started the first in the world in ONKALO®

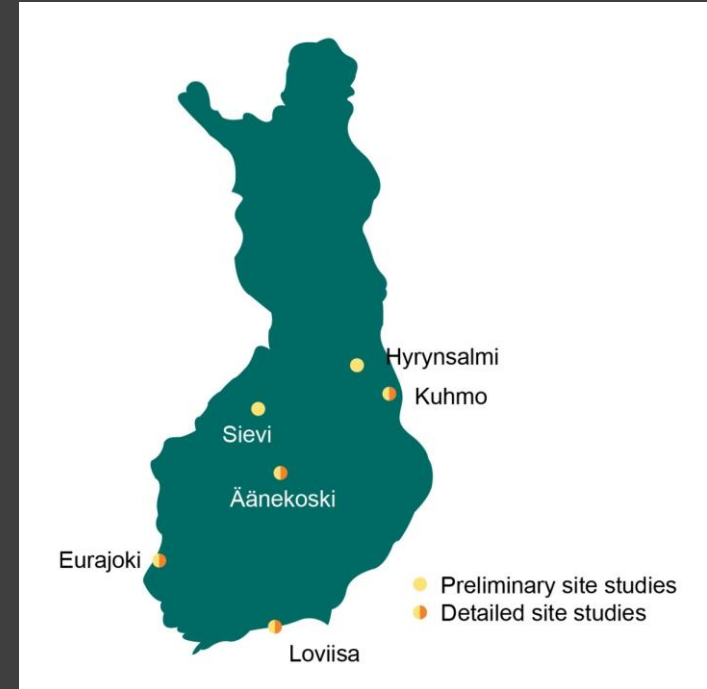


Site selection research program 1983 – 2000

Site Identification phase 1983 - 1985



More than 100 candidate sites were identified



Everyone is an important stakeholder



Decisive arguments in Parliament

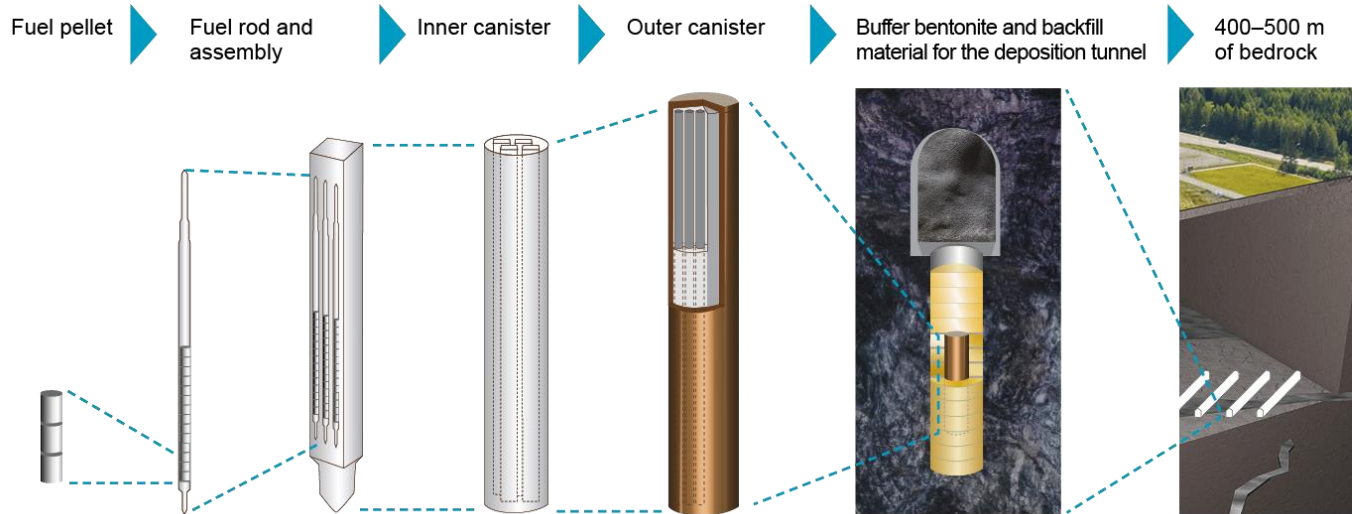
“Aiming at final disposal is a better solution than just resorting to interim storing”

“Option for retrievability of waste canisters must be maintained”

“The present generation has to accept responsibility for nuclear waste”

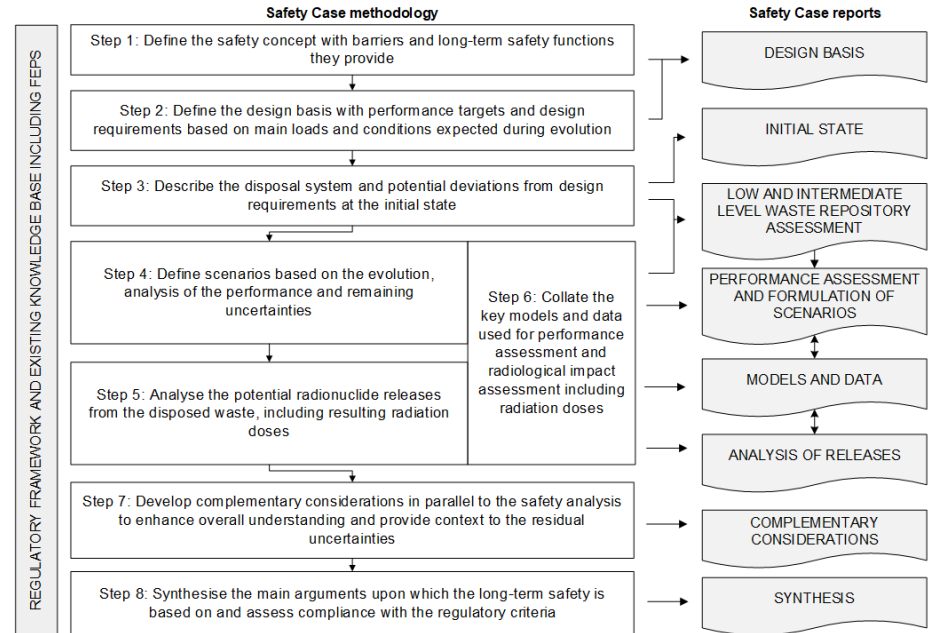
Only safe final disposal is possible

Multi-barrier principle of final disposal: several release barriers backing up each other ensure long-term safety



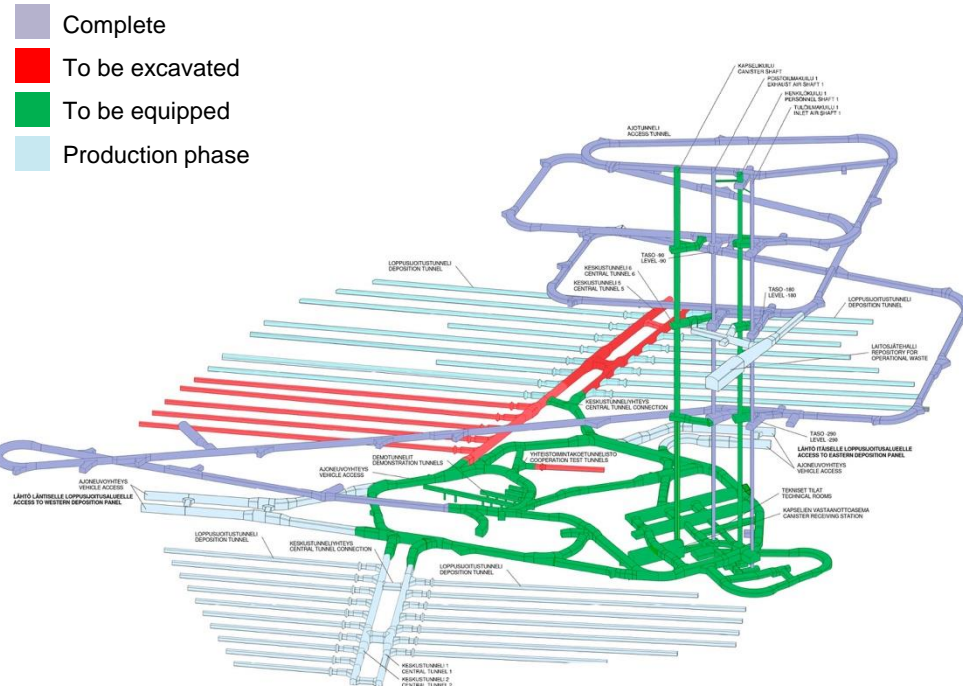
Long term safety and safety case

- The safety of the geologic disposal is assessed during the construction and operation of the geologic disposal facility and after the closure of the facility
- Long-term safety concerns the time scales after the operational period
- In long-term safety the behavior of the engineered barriers is assessed in Olkiluoto's bedrock conditions over the period of thousands of years
- Safety case has been prepared for construction license application and is updated to operational license application



Construction work of ONKALO® continues

- Access tunnel and vehicle access, approx. 6.5 km complete
- Technical rooms –437 m
- Personnel shaft equipped
- Canister shaft reinforced
- Inlet and exhaust air shafts
- Canister receiving station and storage
- Access to the repository
- Vehicle access tunnels approx. 1,500 m
- Central tunnels approx. 600 m
- Deposition tunnels (5 x 350 m)
- Deposition holes of the 1st deposition tunnel

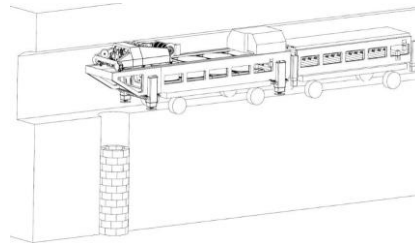
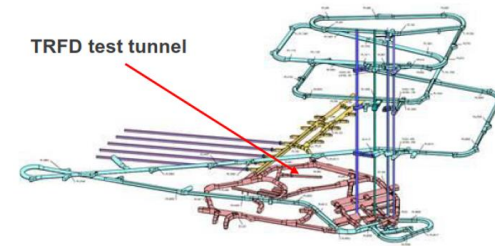


The Trial Run of Final Disposal in a nutshell

The trial run is the final phase of Posiva's preparing for the operation of the DGR. It will be commenced on 2023.

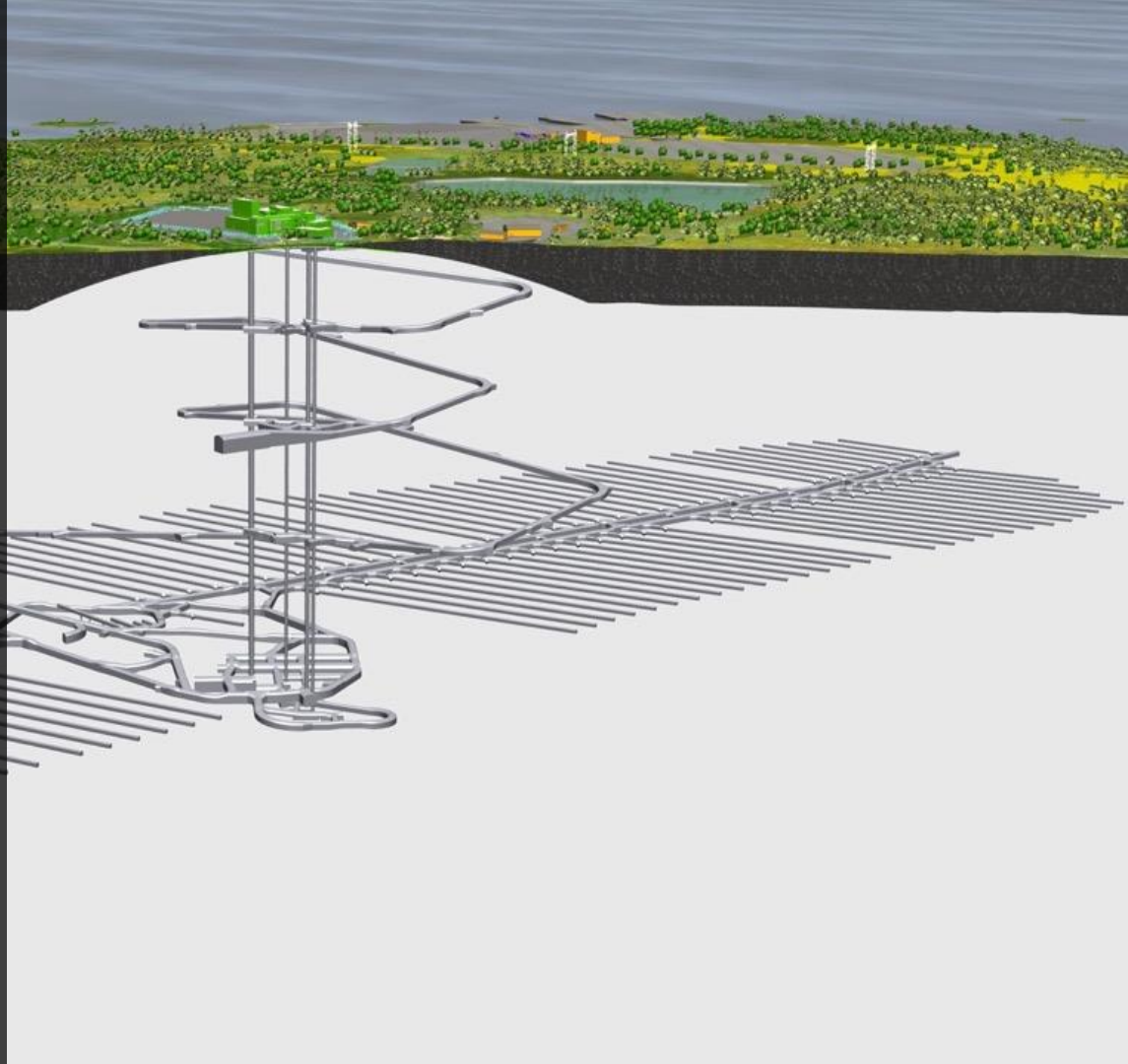
The idea of TRFD is to demonstrate operational capabilities; fuel transport, encapsulation, final disposal, retrieval test from final disposal level to transfer cask with dummy-fuel elements in TRFD test tunnel with length of ~70m and place for 4 disposal holes.

The trial run provides a demonstration to multiple stakeholders that Posiva can manage the entire final disposal process and is able to start the industrial operation of ONKALO®.



Disposal facility in 2120

- Disposal facility capacity 6,500 tU (approx. 3,250 canisters)
- Construction time and service life approx. 100 years
- Repository volume approximately 1.5 million m³
- Length of tunnels approximately 50 km
- Statement of the Radiation and Nuclear Safety Authority (STUK) regarding the construction licence of Posiva: The disposal facility will remain safe without external actions once it has been closed off





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Posiva's
ONKALO® is a
game changer.



IAEA DG Mr. Grossi in ONKALO® 26 Nov 2020



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You know that Posiva's personnel
and network are making history with
the work that they do.

21.10.2021

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Posiva's solution for the final
disposal of spent nuclear fuel
enables the sustainable
production of nuclear electricity





Posiva

Global leader
in final disposal