Financing the Finnish Final Disposal

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Final Disposal of Spent Nuclear Fuel in Finland

TEOLLISUUDEN VOIMA OYJ
- Olkiluoto power plant
- Interim storage of spent nuclear fuel

FORTUM POWER & HEAT
- Interim storage of spent nuclear fuel
- Loviisa power plant

POSIVA OY
- Operating waste repository
- Final disposal of spent nuclear fuel

Operating waste repository
Posiva’s program has progressed already for 40 years

- Studies of geological disposal started
- Site selection research
- Selection of Olkiluoto
- Construction of ONKALO® and site confirmation studies in Olkiluoto
- Construction of disposal facilities
- Test operation, commissioning
- Starting final disposal of spent fuel

- Decision in principle by the Government and the Parliament
- Application for the construction license
- Construction license granted by the Government in 2015
- Application for the operation license
- Early 2020’s

- Government’s decision on timetable
- EIA-law into force, amendment of Nuclear Act
- 1978
- 1983
- 1994
- 2001
- 2012
- 2015
- 5.12.2018
FINANCING MODEL OF NUCLEAR WASTE MANAGEMENT

Realized costs to Fortum and TVO by 2018 ca. 1000 M€

TVO
A-series B-series
OL1, OL2 OL3

TVO’s waste management:
- Decommissioning
- SNF intermediate storage
- LILW final repository

Fortum’s Clients

Fortum
LO1, LO2

Fortum’s waste management:
- Decommissioning
- SNF intermediate storage
- LILW final repository

Realizing costs to Fortum and TVO by 2018 ca. 1000 M€

Collecting the funds

NUCLEAR WASTE MANAGEMENT FUND
2017: TVO 1471 M€
Fortum 1153 M€

Posiva
Final disposal of spent nuclear fuel
Cost (=fund size) updates

- Costs are reviewed every third year by the utilities for the next five years *(to end of each year)*
- The utilities deliver the estimate to the Ministry and it is reviewed by the Ministry, STUK *(regulator)* and VTT *(Technical Research Centre of Finland Ltd)* and sometimes the Ministry uses other specialists as well
- Based on the approved estimate, the fund target sum is then revised and utilities’ payments changed, if needed

- During the time between the reviews the target sum is updated based on inflation and if needed, other factors
Estimate of total costs of the Finnish final disposal

Scope:
- Olkiluoto 1 & 2 spent fuel from 60 years operation
- Olkiluoto 3 spent fuel from 60 years operation
- Loviisa 1 & 2 spent fuel from 35 years operation
- 6500tU / 3250 canisters

Cost estimate:
- Used so far 1000 M€
- Constructing the final disposal facility 1000 M€
- Operation costs for 100 years: 3000 – 4000 M€
- Closure 250 M€
- TOTAL 5250 – 6250 M€
Posiva Solutions can offer a wide range of expert services for organizations engaged in nuclear waste management operations. With our experience you can save time and cost.
Posiva Solutions can help you in e.g. the following areas:

1) **Preparation of Deep Geological Repository development strategy and project management plan**

2) **Selection and characterization of the site for deep geological disposal**
   - assessment and development of procedures and methods as well as investigations,
   - preparation of site descriptive models of the selected sites,
   - development of information database and interfaces, specific site characterisation methods, safety case and supporting safety assessments, procedures and methods for the development of engineered barriers.

3) **Design and engineering** of the final repository, disposal machinery and affiliated facilities like e.g. encapsulation plant

4) **Cost estimates and cost optimization** of the preparation and construction of the deep geological repository and funding of nuclear waste management cost

5) **Stakeholder management and acceptability;** roles and responsibilities, communication and interaction with stakeholders like general public, relevant authorities, NGOs etc.
Our Clients

- SÚRAO, Czech Republic
- Nagra, Switzerland
- Fennovoima, Finland
- CNPE, China
- BRIUG, China
- RWMC, Japan
- NWMO, Canada
- SKB International, Sweden
- ANDRA, France
- RWM, UK
- Fortum, Finland
- TVO, Finland
Thank you!