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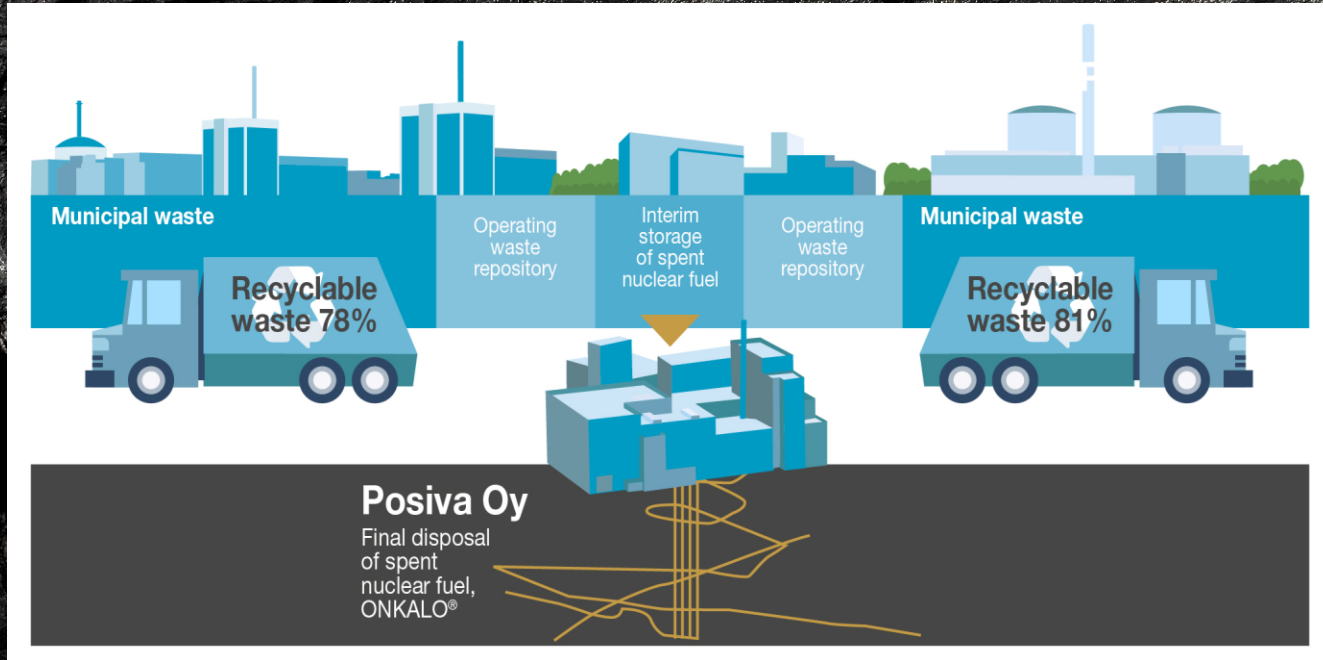
# **Constructing the world's first final disposal facility for spent nuclear fuel in Olkiluoto**

**Nuclear Science and  
Technology Symposium 2019**

**Tiina Jalonen  
Director, Development**

**Posiva Oy**

# Responsibility in nuclear waste management





# Complete Nuclear Waste Management on one island – Olkiluoto, Finland

## SPENT FUEL INTERIM STORAGE FACILITY

Cooling of fuel assemblies removed from 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®
- Construction license for the final disposal facility was granted in 2015 and construction began in December 2016



# Posiva Oy

## Mission

***Safe and cost efficient final disposal of spent nuclear fuel for our owners***

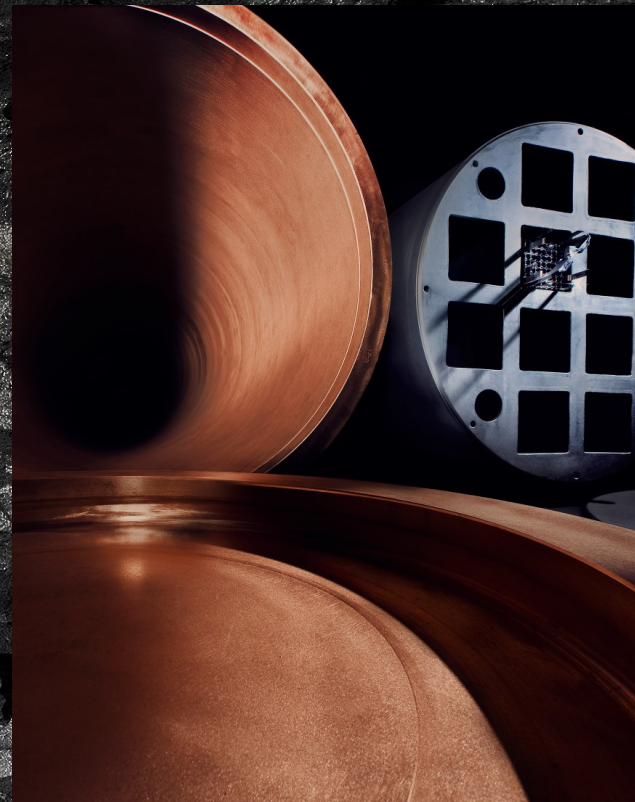
## Vision

***The world leader in final disposal of spent nuclear fuel***

- Established in 1995
- Private company, owned by Finnish NPP operators TVO and Fortum
- Turnover 73 M€ (2018)
- 90 staff + in addition expertise from partners

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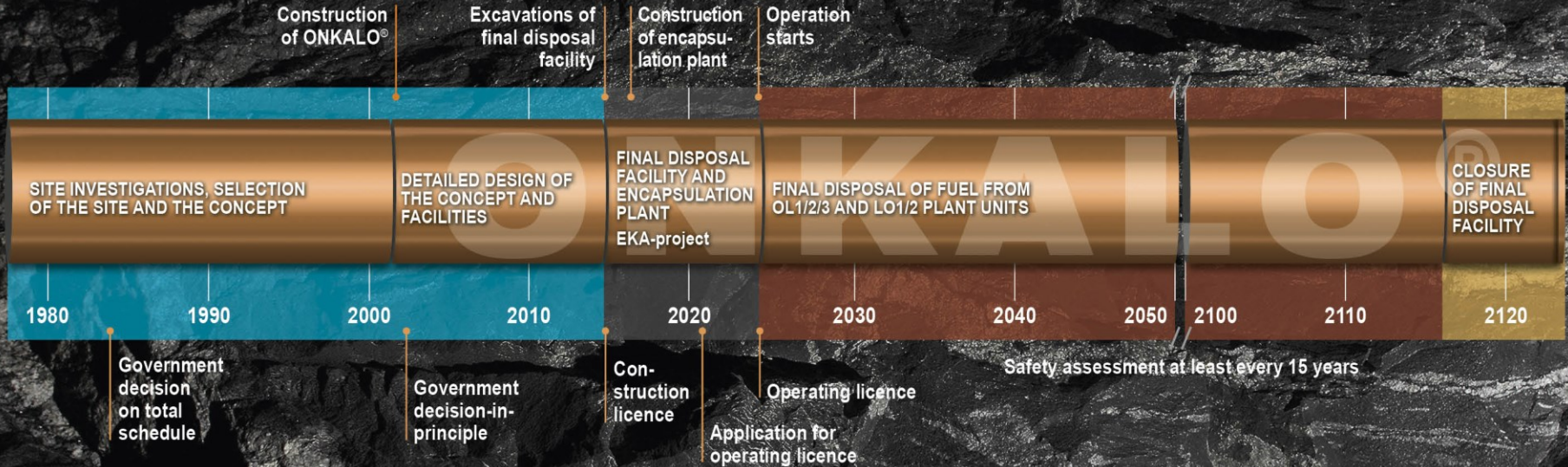
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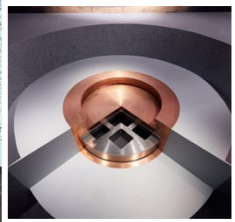
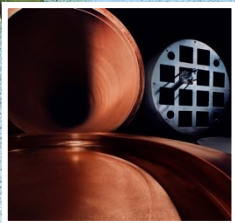


# Steps for final disposal of spent fuel

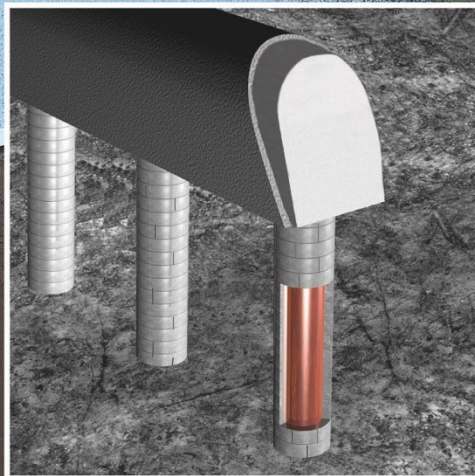




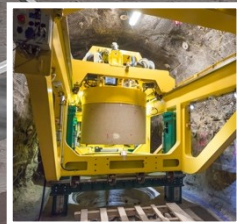
# Safe and feasible final disposal concept in Olkiluoto



Development of the engineered barriers



Site investigations



Development of the machinery

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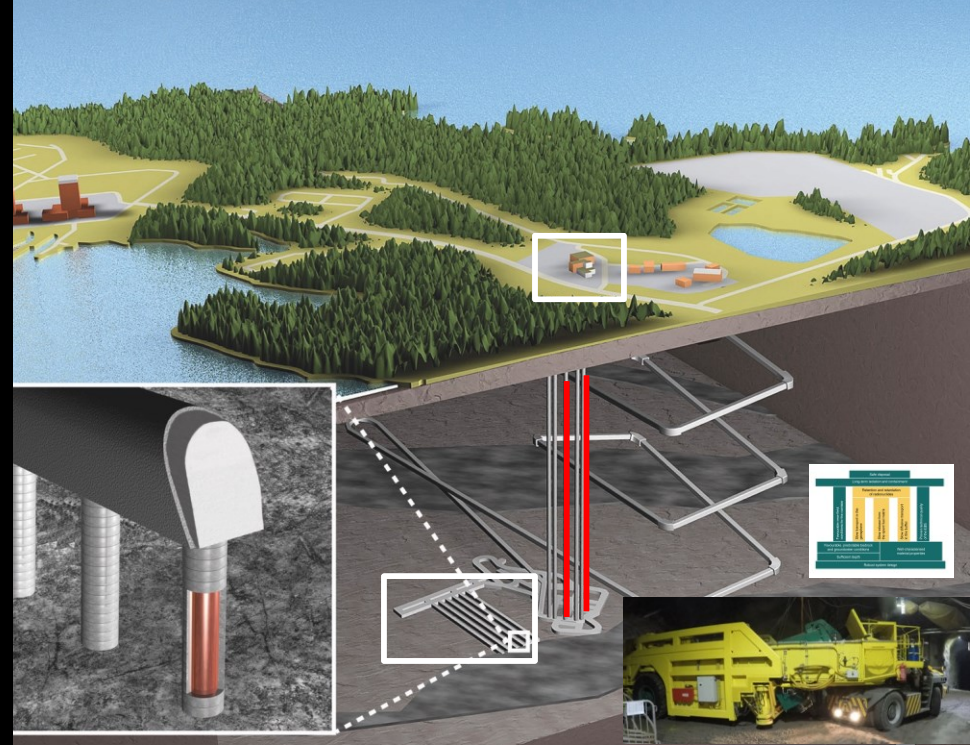


# A Remarkable "Go-ahead" decision in June 2019 by Posiva's owners

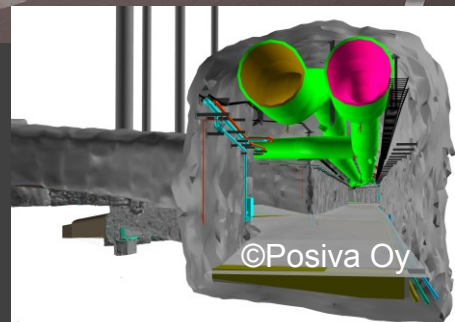
- Preceded by an evaluation of readiness of the entire program
- Construction, equipping and commissioning of the encapsulation plant
- HVAC equipping of the final disposal facility
- Excavation of the central tunnels and the first deposition tunnels
- Underground disposal machinery
- Canisters and clay components
- OLA and the safety case
- Start of the disposal operation for the first deposition tunnel

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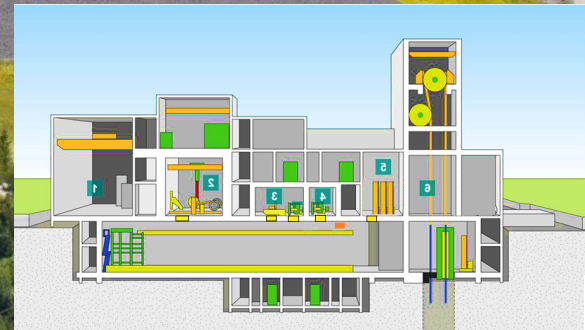
500 M€ investment cost  
2500 person years  
500 persons at the max



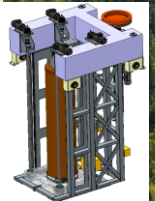


# ONKALO® site

## Encapsulation plant under construction



## Encapsulation process and systems



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# Encapsulation plant construction site



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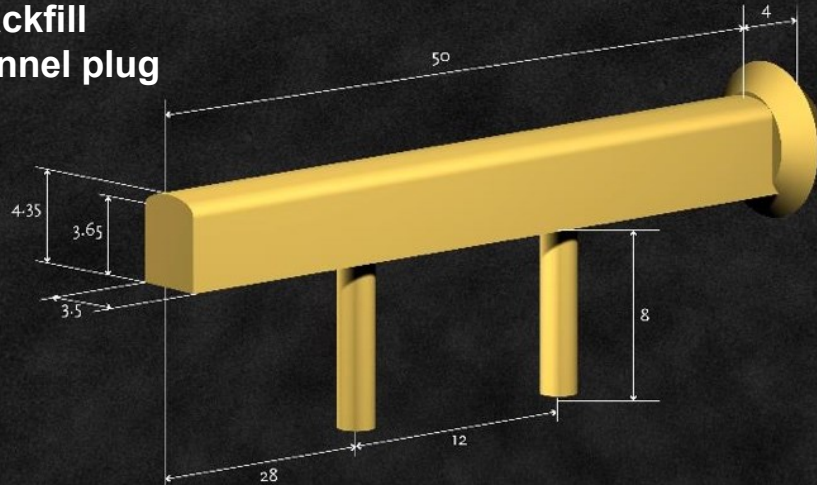
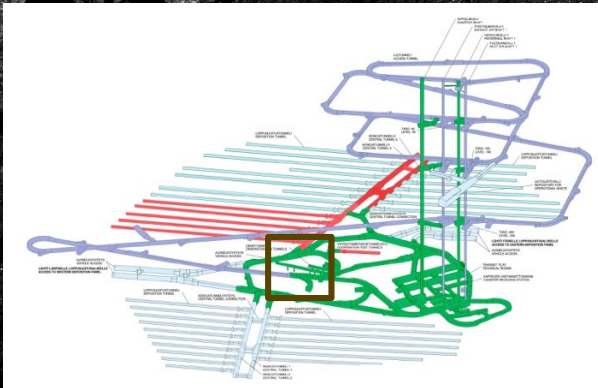
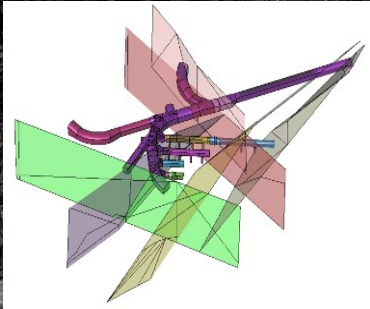






# Testing of the concept: Full Scale In-Situ System Test

- Design, manufacture, installation and comprehensive monitoring of EBS components:
  - 2 copper canisters (with heating equivalent to the fuel decay heat)
  - buffer in two deposition holes
  - about 50m backfill
  - deposition tunnel plug





# Prototype installation machinery tested





# Monitoring the early evolution of the system

- Temperature
- Pressure
- Distribution of water in clay
- Gas content in tunnel



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A scenic view of a small waterfall cascading over dark, wet rocks in a forest stream. The water is blurred, creating a sense of motion. The rocks are large and dark, with some white lichen or moss. The background is a dense forest of green trees.

Thank you  
for your  
attention