
Posiva Oy, Finland

World leader in final disposal of spent nuclear fuel - sharing the experience benefits the whole sector

April 12, 2018
Mika Pohjonen



Posiva Oy

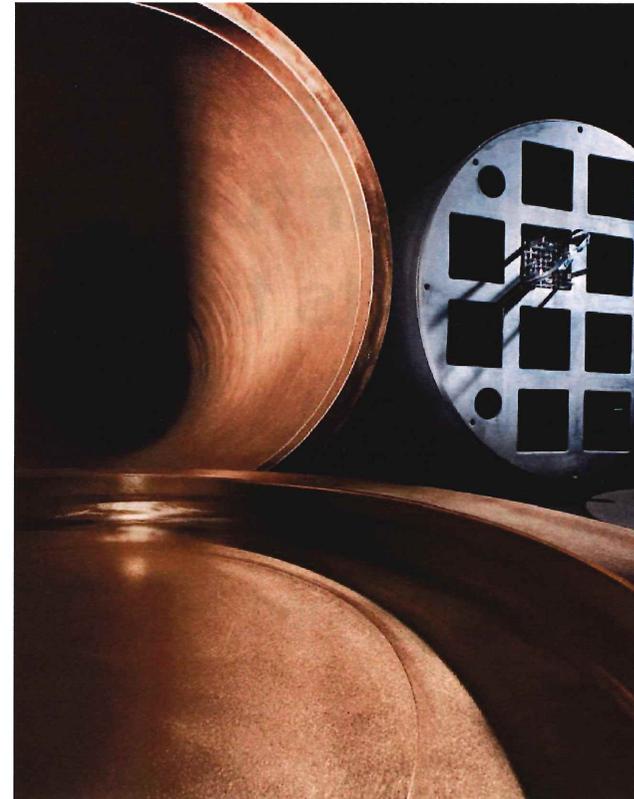
Mission

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

Vision

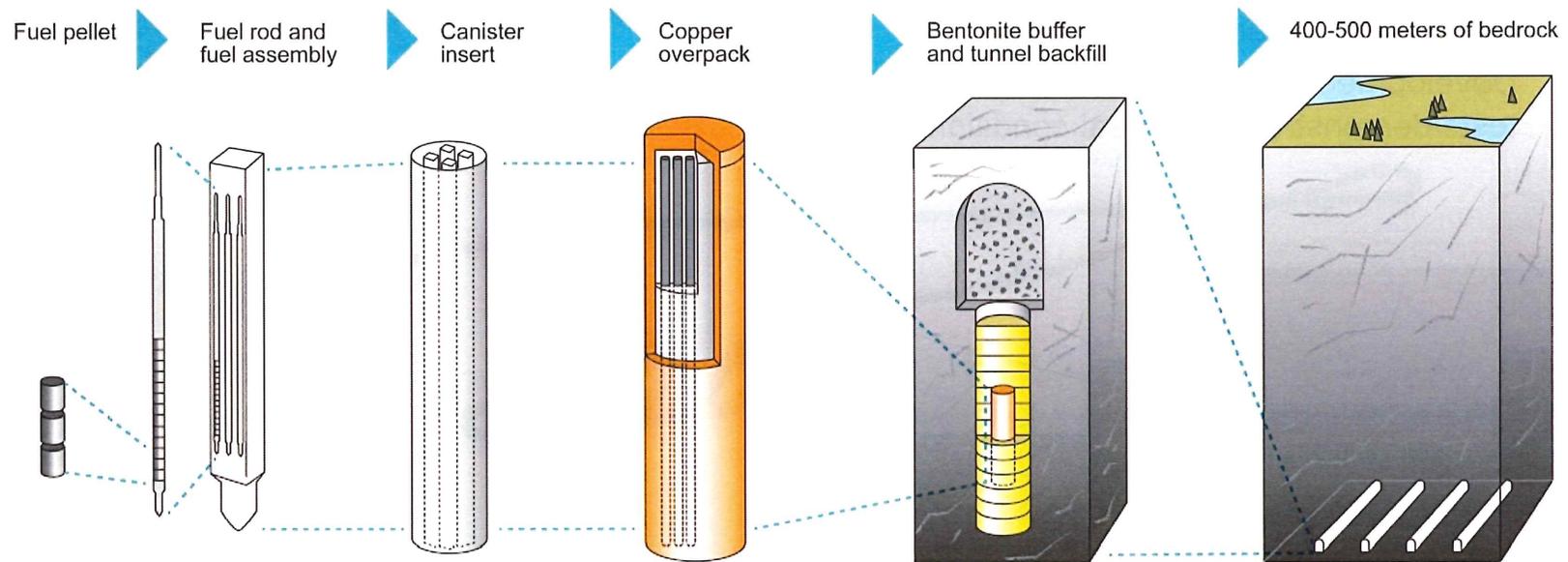
Forerunner in industrial final disposal of spent nuclear fuel

- Established in 1995
- Private company owned by Finnish NPP operators TVO and Fortum
- Turnover 67 M€ (2017)



Only safe final disposal is possible

- The principle of final disposal:
Several release barriers back up each other and ensure long-term safety.

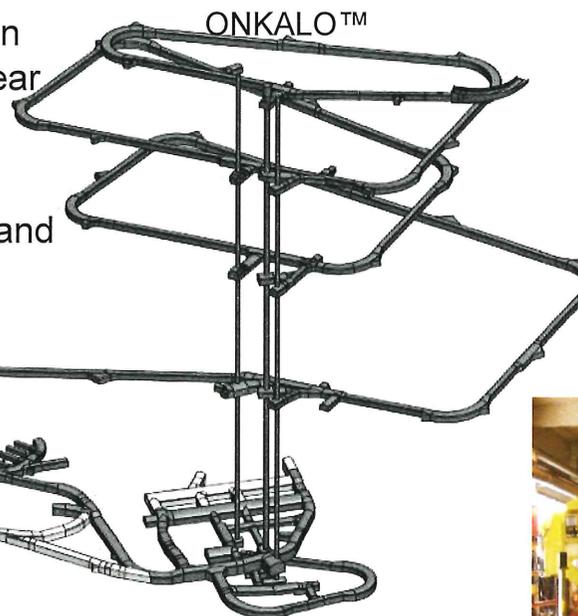


Posiva has the site and has reached the final disposal level underground

- Construction work started in 2004
- ONKALO™ research facility has been built in accordance with the requirements of a nuclear facility
- Study of the details in the bedrock
- Development of rock construction methods and tests/demonstrations in real conditions



Demonstration tunnels -420 m



Drill boring machine



Buffer installation machine

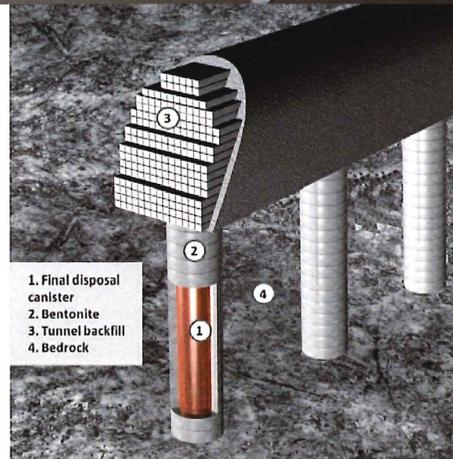
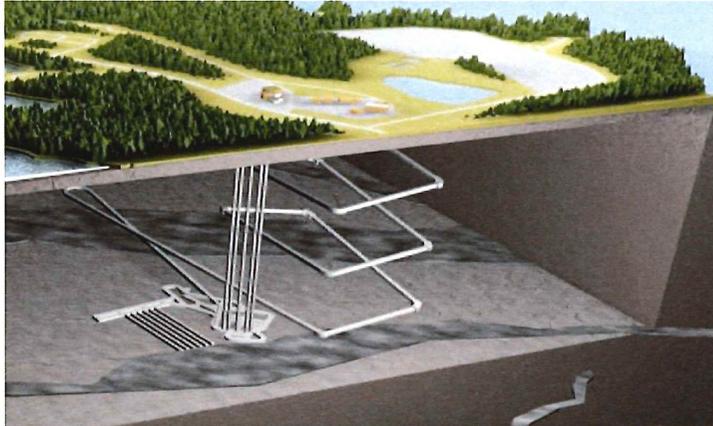
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Pohjonen Mika

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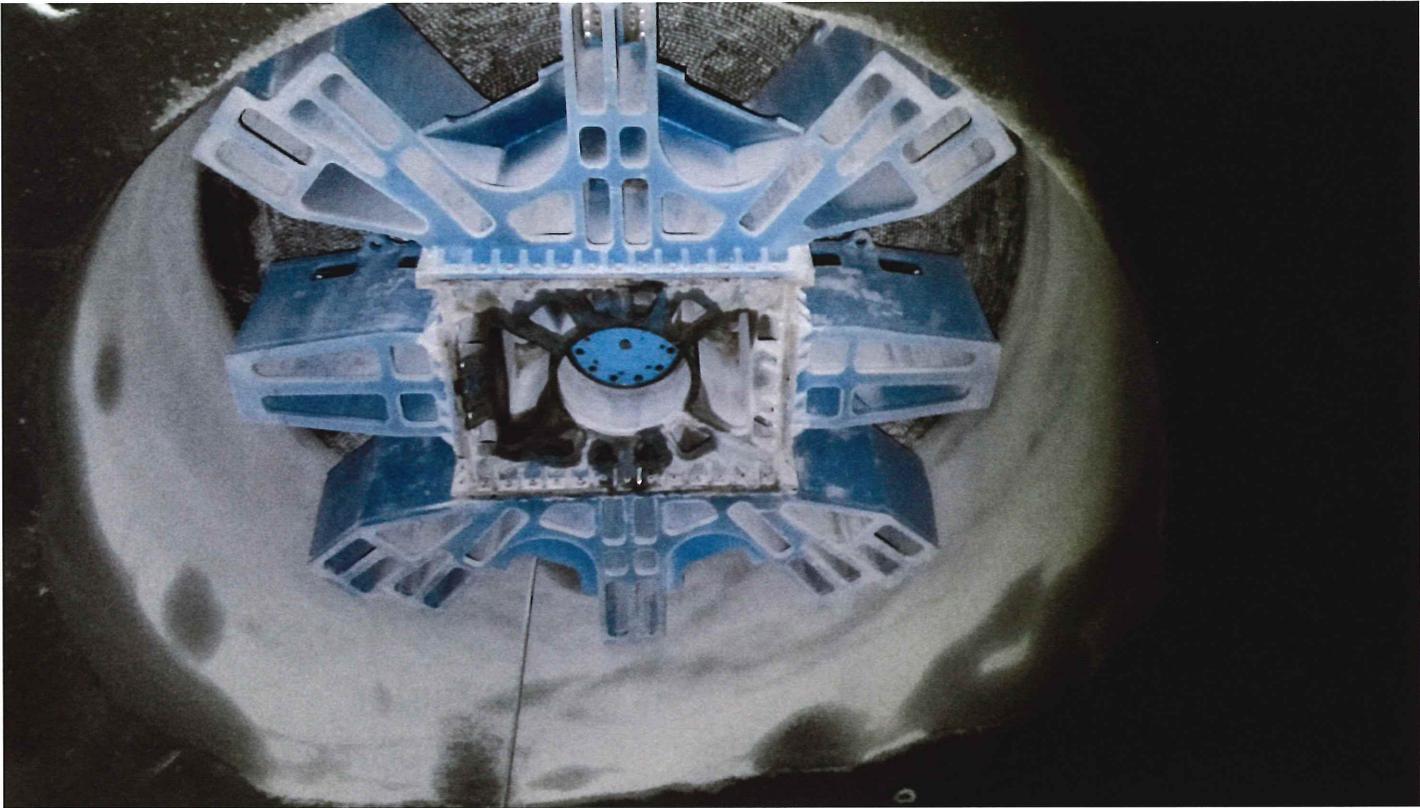
Construction of above- and underground facilities started in 2016



Encapsulation plant construction



Raise boring of the canister shaft started 4th April 2018



Encapsulation plant main equipment ordered

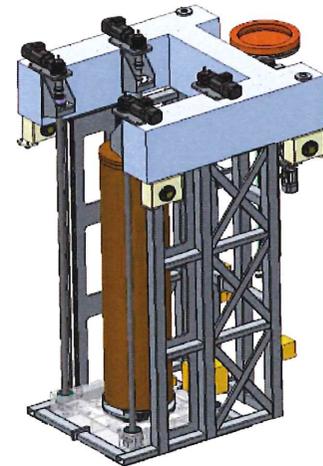
Constructions Industrielles de la Mediterranee SA (CNIM)



Transport cask
vehicle



Spent fuel
transport vehicle



Canister
transport car



Encapsulation plant main equipment ordered

NKM Noell Special Cranes GmbH



Bridge crane

Confidential

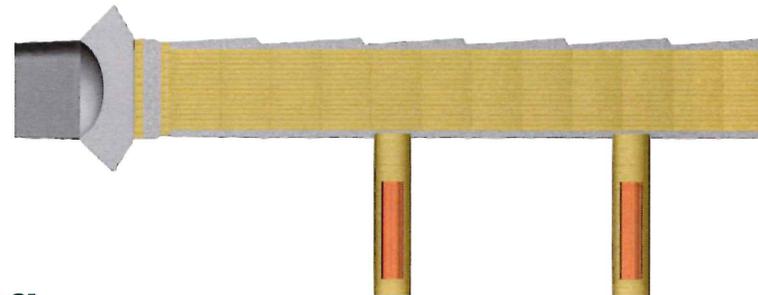


Canister lift



Full Scale In-Situ System Test 2018 - 2019

- Full Scale In-Situ System Test (FISST) is being constructed in ONKALO™ demonstration area at the disposal depth of 420 metres
- Design, 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
- Installation started in June 2018
– ***external partners are participating***



FISST-preparation in ONKALO™

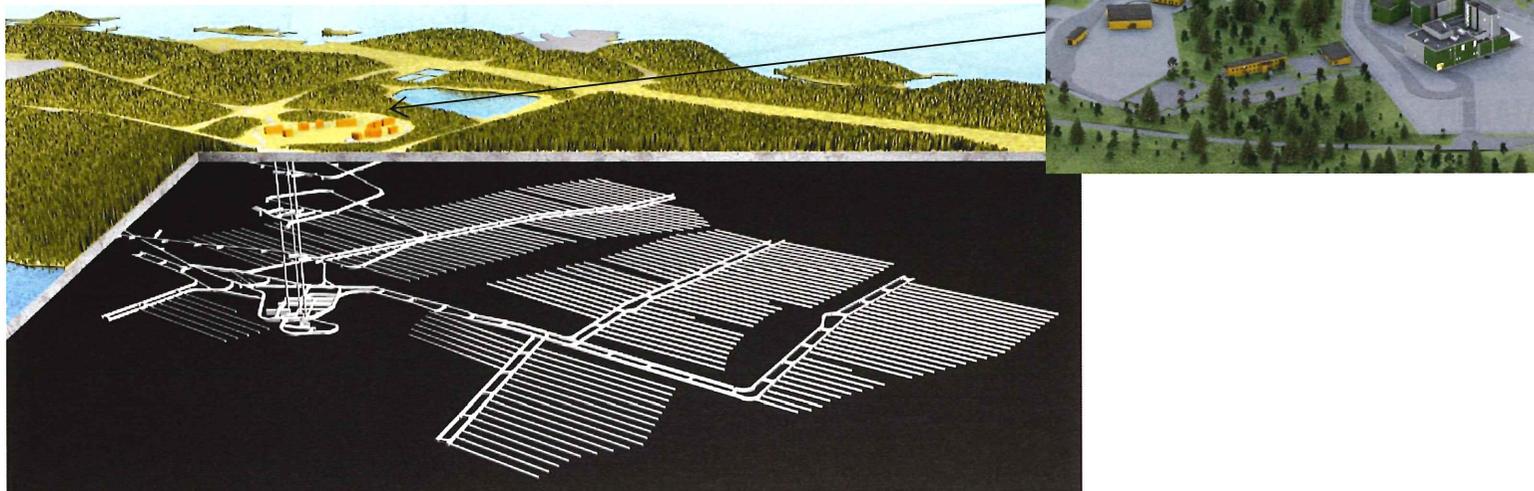


FISST-preparation, canister and clay components

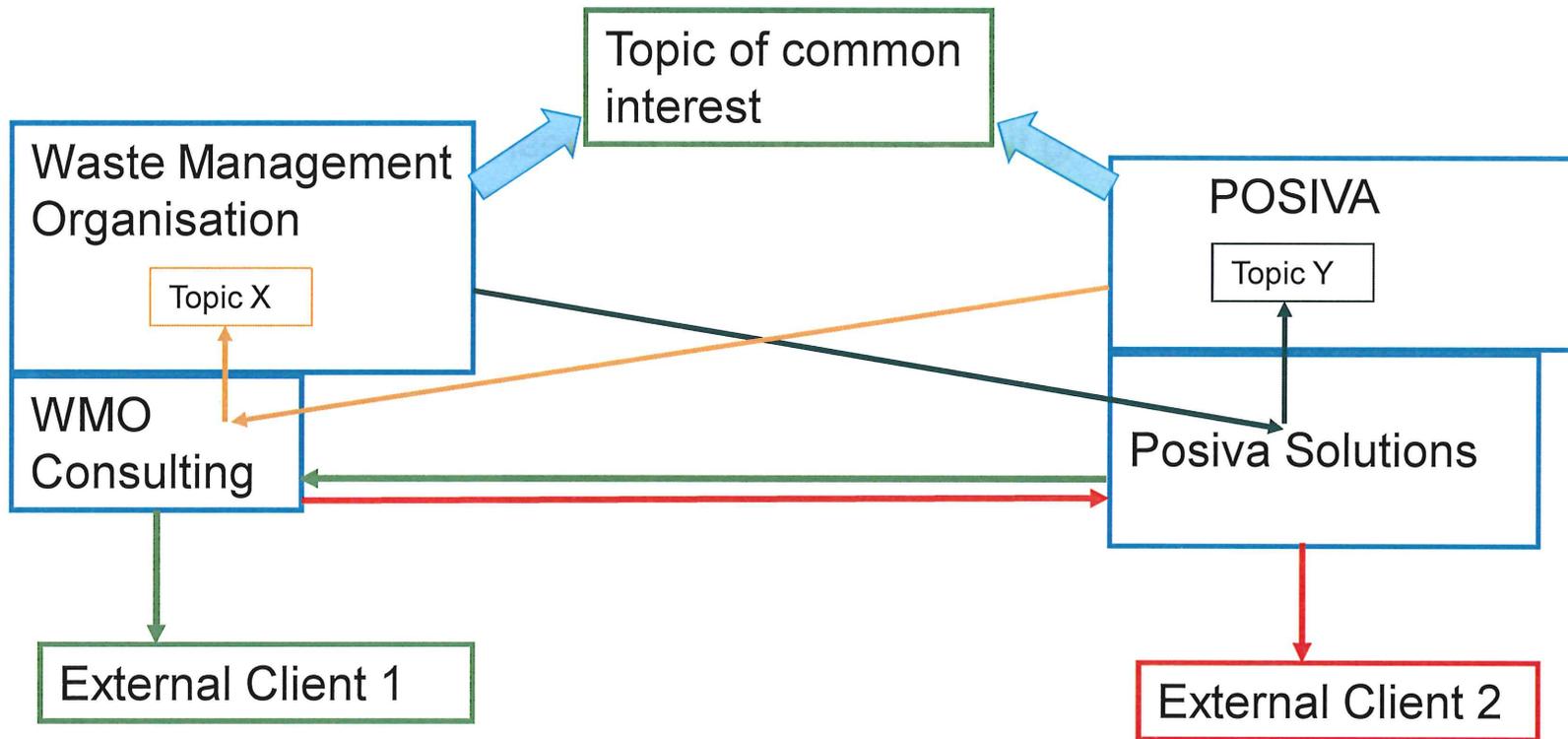


Final disposal facility around 2120

- Repository capacity is 6500 tU (about 3250 canisters)
- Depth of the tunnel system -400-450 m and the extent is about 2 km²
- Construction and operating time approximately 100 years
- The volume of the cave about 2 million m³
- Tunnel length about 60-70 km



Co-operation models with other WMOs



Posiva Solutions Oy

- Provides tailored expert services related to final disposal of spent nuclear fuel in collaboration with an extensive network of partners
- Expertise is based on Posiva's decades-long experience in design, research and development
- Established in June 2016, subsidiary of Posiva



ONKALO™ - world's first Deep Geological Repository under construction

With our experience you can save time and money!



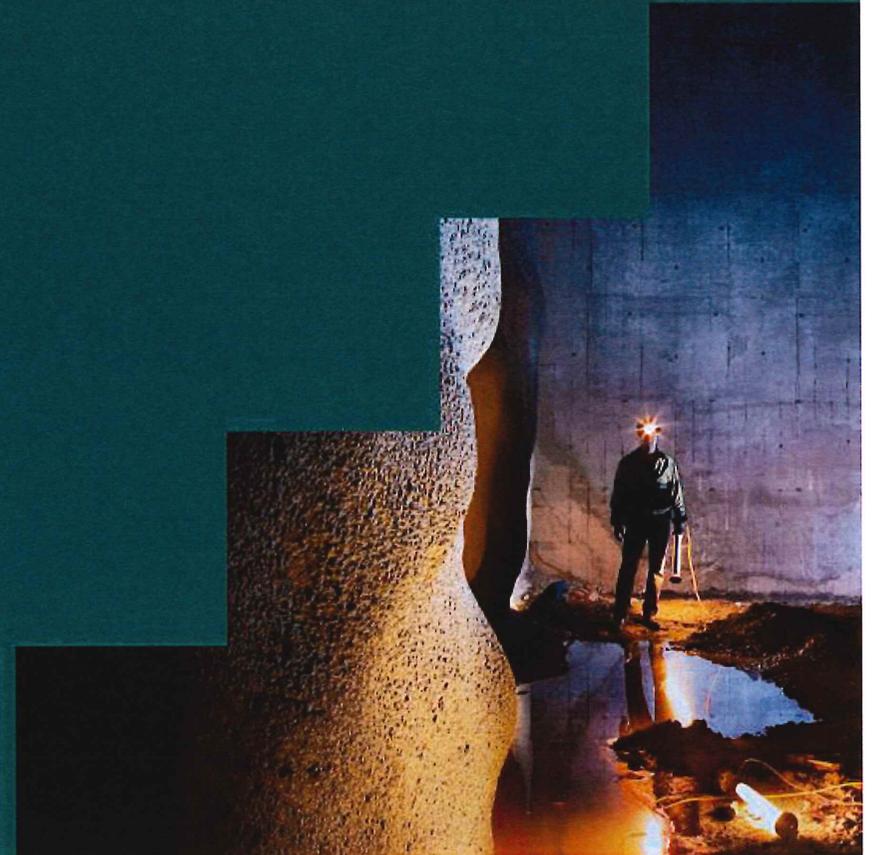
Posiva Solutions can help you in e.g. the following areas:

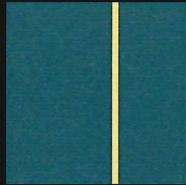
- 1) **Preparation of Deep Geological Repository development strategy and project management plan**
- 2) **Selection and characterization of the site for deep geological disposal**
 - assessment and development of procedures and methods as well as investigations,
 - preparation of site descriptive models 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
- KNEA, Korea
- NWMO, Canada
- SKB International, Sweden
- ANDRA, France
- RWM, UK





POSIVA SOLUTIONS

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.

