ONDRAF/NIRAS

Geological disposal project

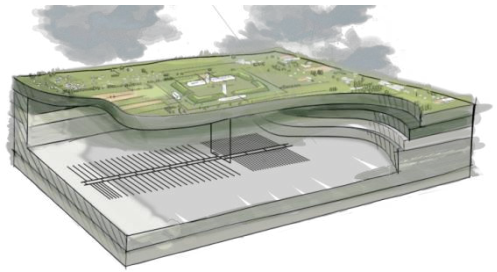
BVS-ABR E&T event
Radioactive Waste ‘from cradle to grave’

23 September 2022

Peter De Preter & Maarten Van Geet

Long-term management

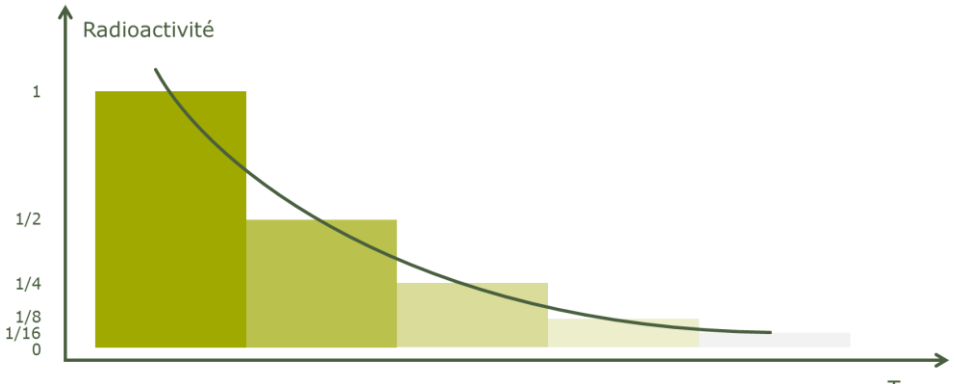
	Low-level waste	Medium-level waste	High-level waste
Short-lived waste	Category A	Category A	Category C
Long-lived waste	Category B	Category B	Category C



Radioactive waste

Classification

	Low-level waste	Medium-level waste	High-level waste
Short-lived waste	Hundreds of years		
Long-lived waste	Hundreds of thousands of years		

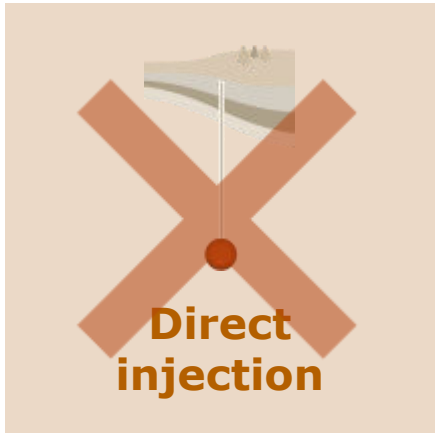


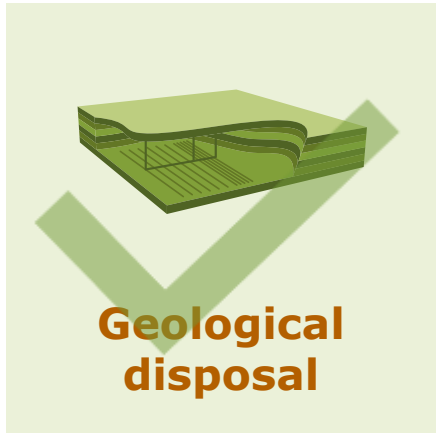
Current management situation: temporary storage

Geological disposal

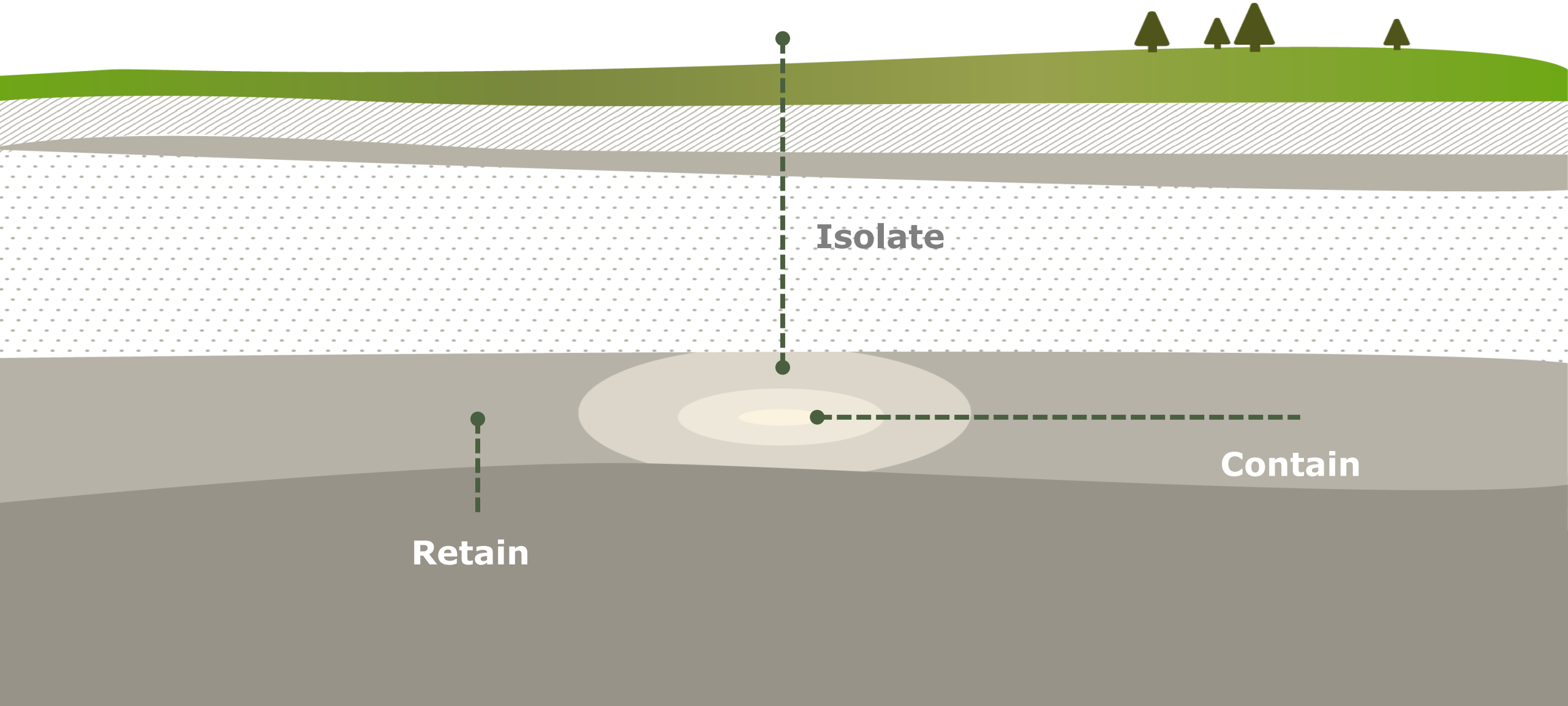
Long-term management

What are the options?

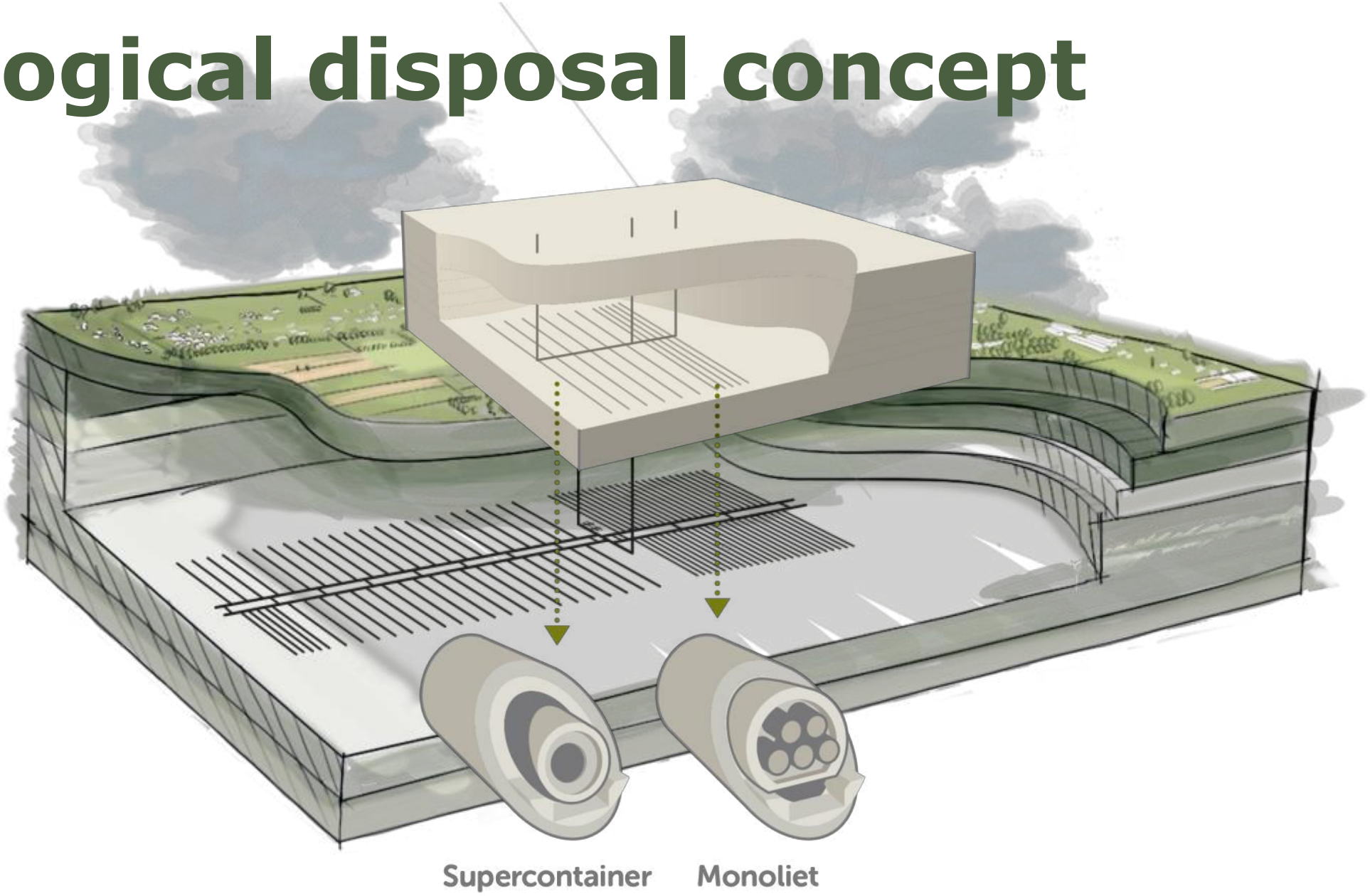




Why geological disposal?



Geological disposal concept

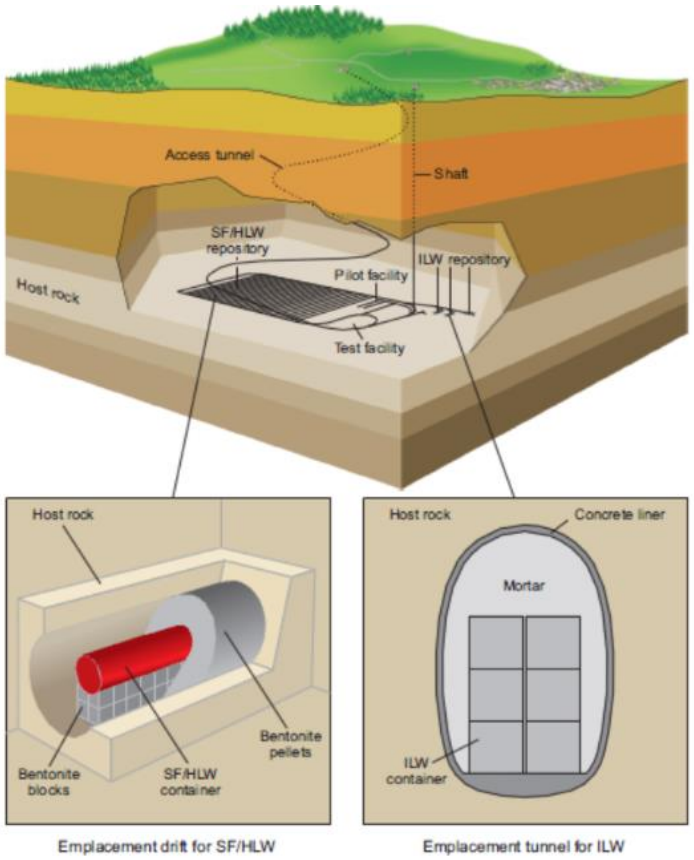


International situation

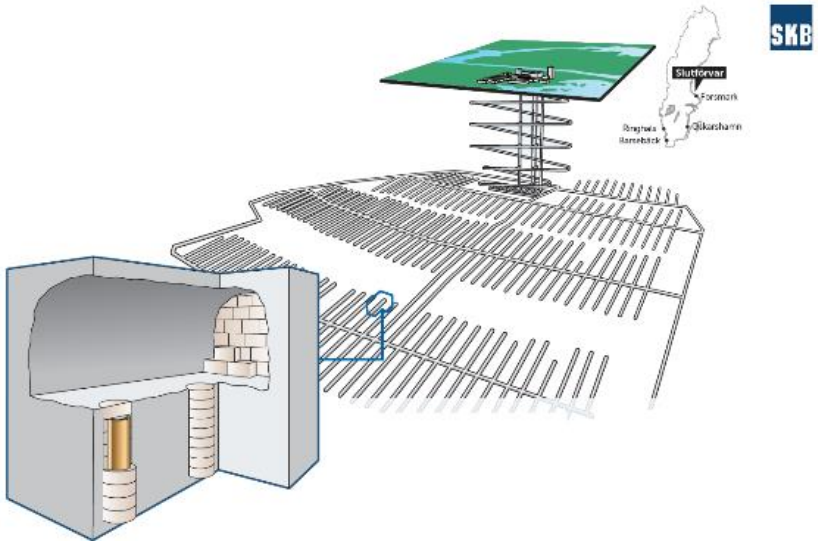
- **High-level waste** programmes in other countries in different phases
  - Construction phase – Finland
  - Construction license obtained – Sweden
  - Preparing for construction license– France
  - Site selection – Canada, UK, Switzerland, Germany...
- EC Directive 2011/70/Euratom
  - *"It is broadly accepted at the technical level that, at this time, deep geological disposal represents the safest and most sustainable option as the end point of the management of high-level waste"*

Geological disposal in galleries – internationally

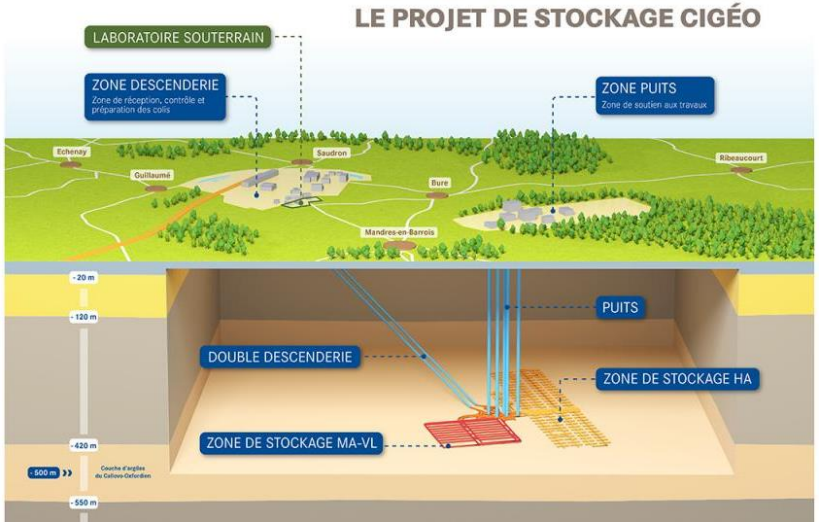
Switzerland



Sweden



France



What's the situation today?

Multidisciplinary R&D since 1980

Impact of excavation on clay characteristics

Diffusion of radionuclides

Characterisation of the clay

Excavation techniques

Impact of heat on clay characteristics

Supercontainer design

Thermo-hydromechanical behaviour of clay

What are the results?

Industrial excavation

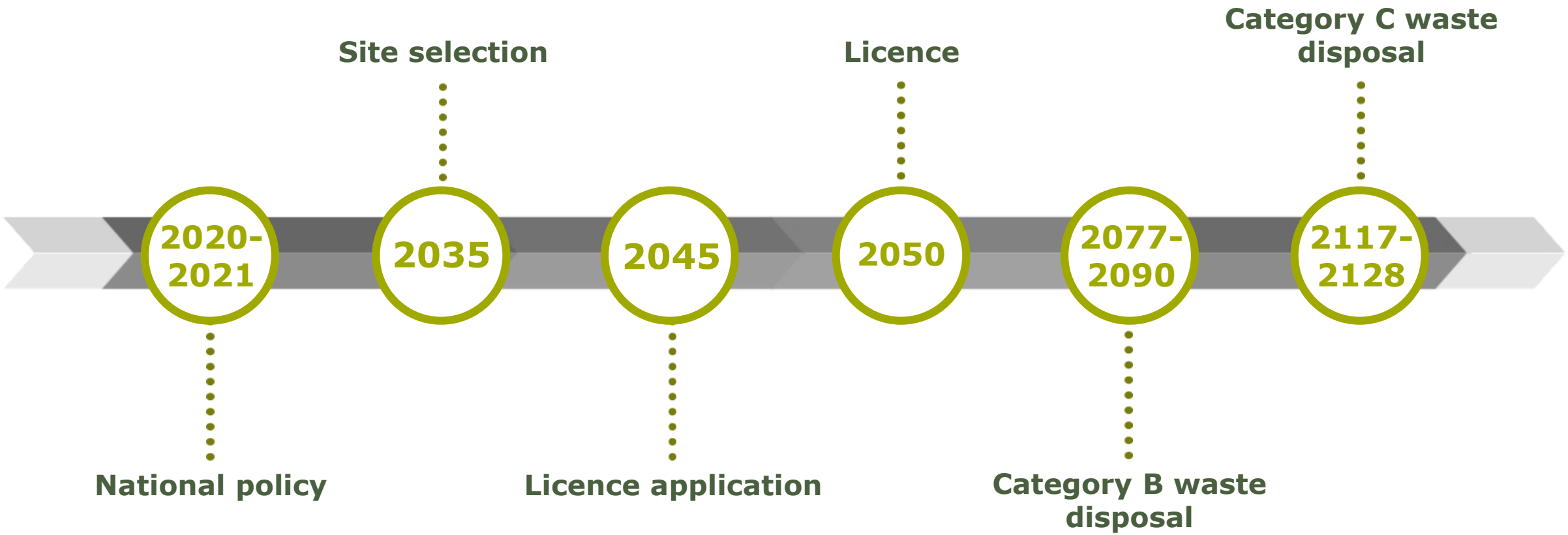
Technically and economically feasible

Safety of deep disposal

Waste can be packaged

Noor
Smet
Smet

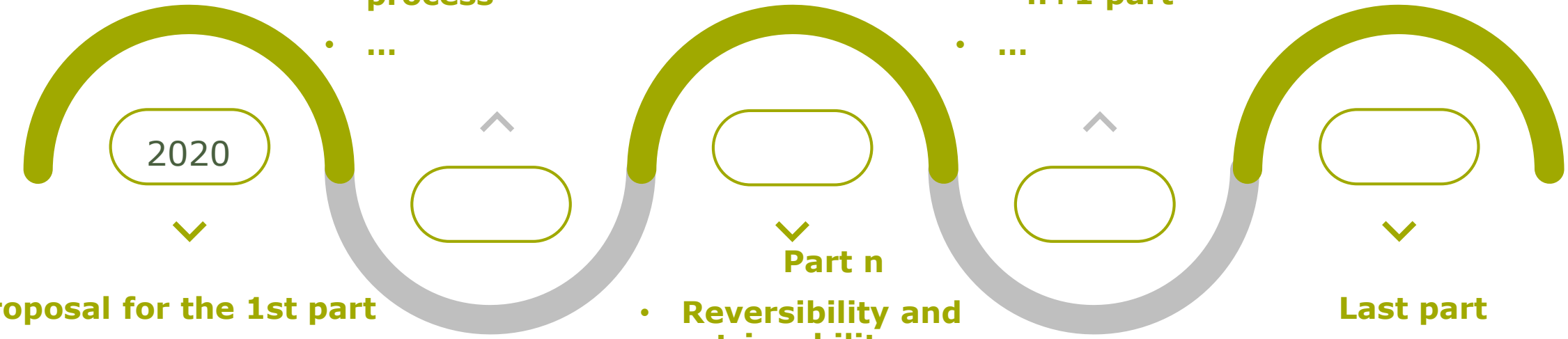
Reference timeline (RD&D, cost)



Participation process

Integrated project

Gradually adopted National Policy B&C (+ SEA procedure)



Proposal for the 1st part

- Geological disposal
- Belgian territory
- Reversibility of decision-making

2nd part

- Decision-making process
- …

Part n

- Reversibility and retrievability conditions
- Status of spent fuel
- FMT
- …

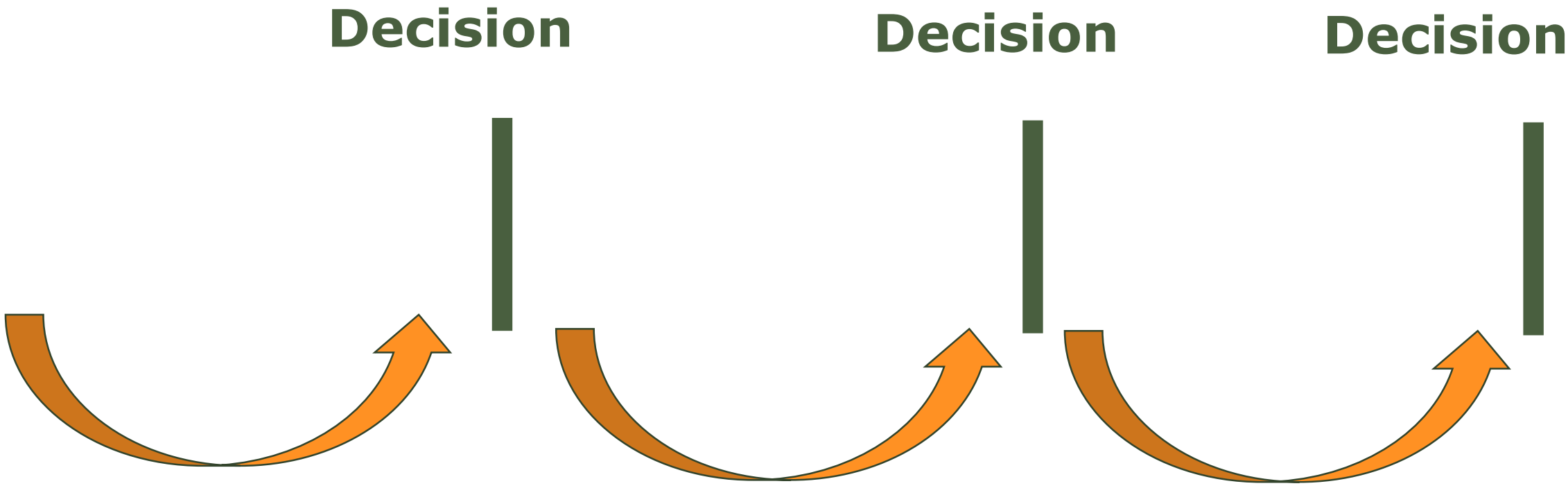
n+1 part

- …

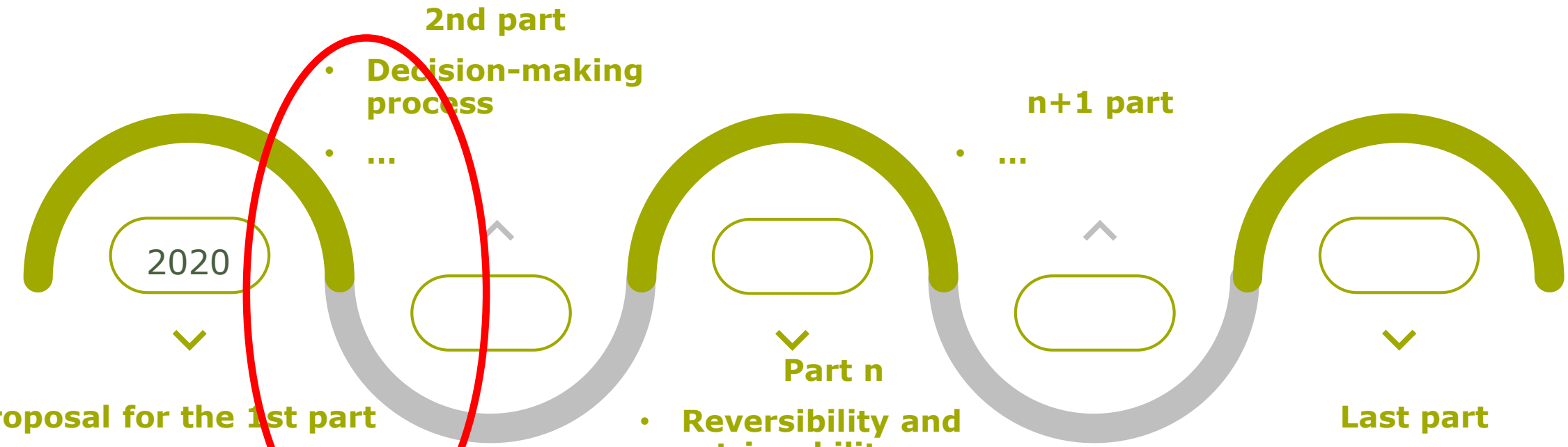
Last part

- Selection of the site(s) where the solution will be implemented

Decision-making process



Gradually adopted National Policy B&C (+ SEA procedure)



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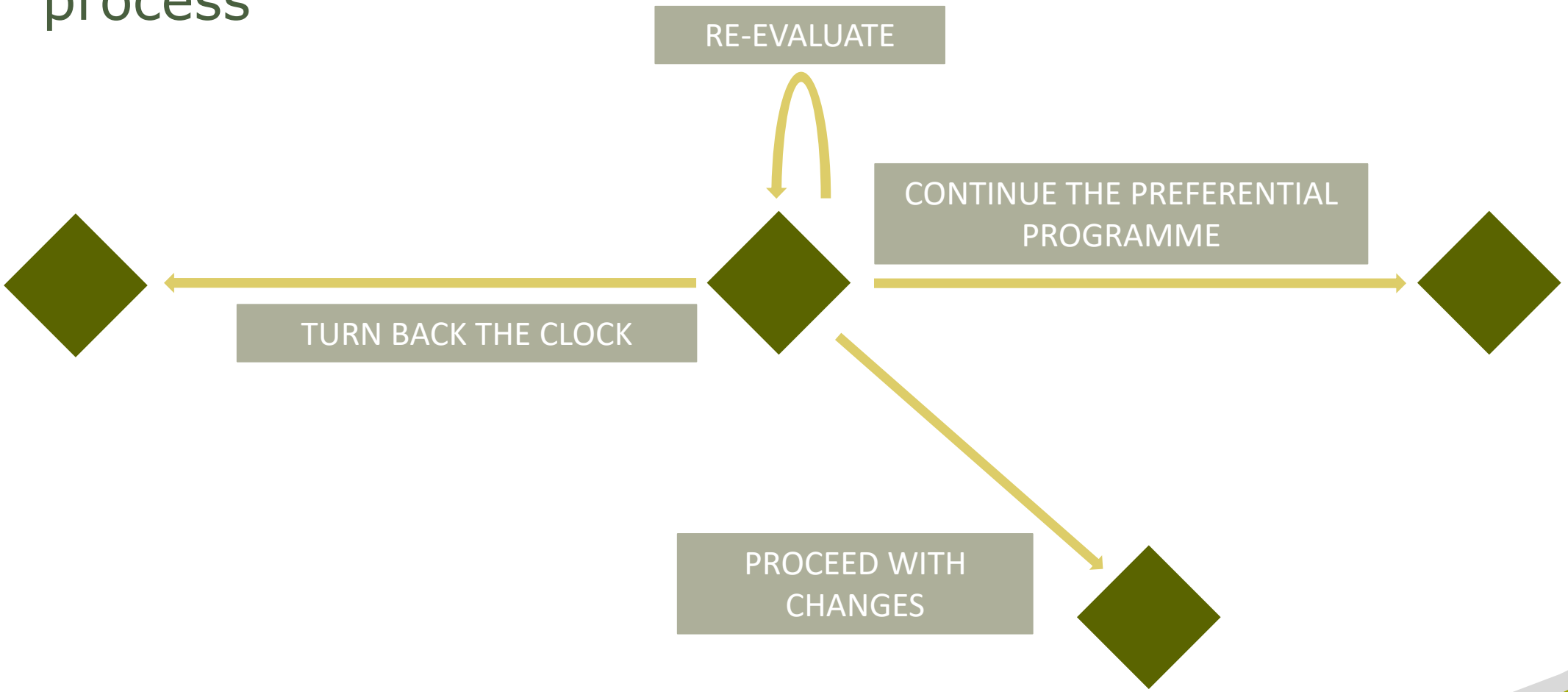
Societal debate

Societal debate 2023 – 2024

- Reconfirmation of deep geological disposal
- Supported recommendations for decision-making process



Perspectives

- From research since 1980 to first policy decision
- A long process towards implementation
  - Establishing reversible and participatory decision-making process based on a broad societal debate (2023 – 2024)
  - Effective participation at every stage
  - Continue RD&D focused on implementation
  - Tracking technological and societal developments
    - Possible implications of P&T, among others
  - Possible cooperation with other countries