



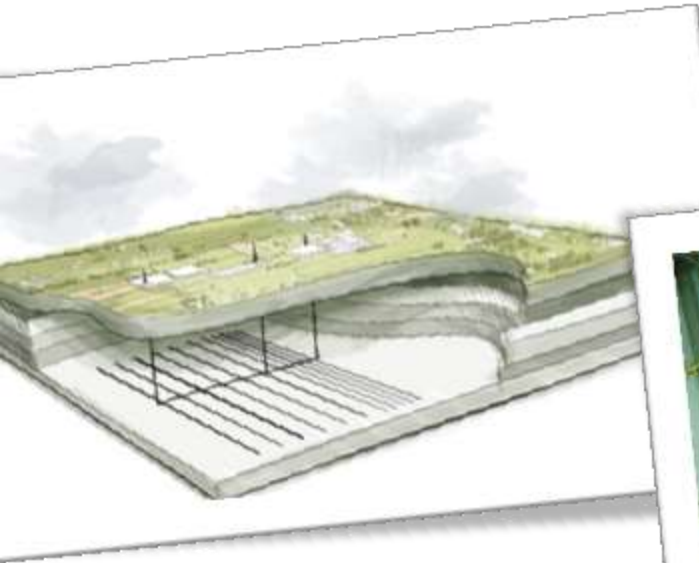
ESV EURIDICE GIE

*European Underground Research Infrastructure for
Disposal of nuclear waste in Clay Environment*





ONDRAF/NIRAS



Peter De Preter

Inhoud

1. Who are we?

- What does ONDRAF/NIRAS do?
- Our vision
- ONDRAF/NIRAS and its partners

2. How do we manage the waste?

- The management of radioactive waste today
- The long-term management of radioactive waste

Who are we?



ONDRAF/NIRAS



What does ONDRAF/NIRAS do?

ONDRAF/NIRAS (= Belgian Agency for Radioactive Waste and Enriched Fissile Materials)

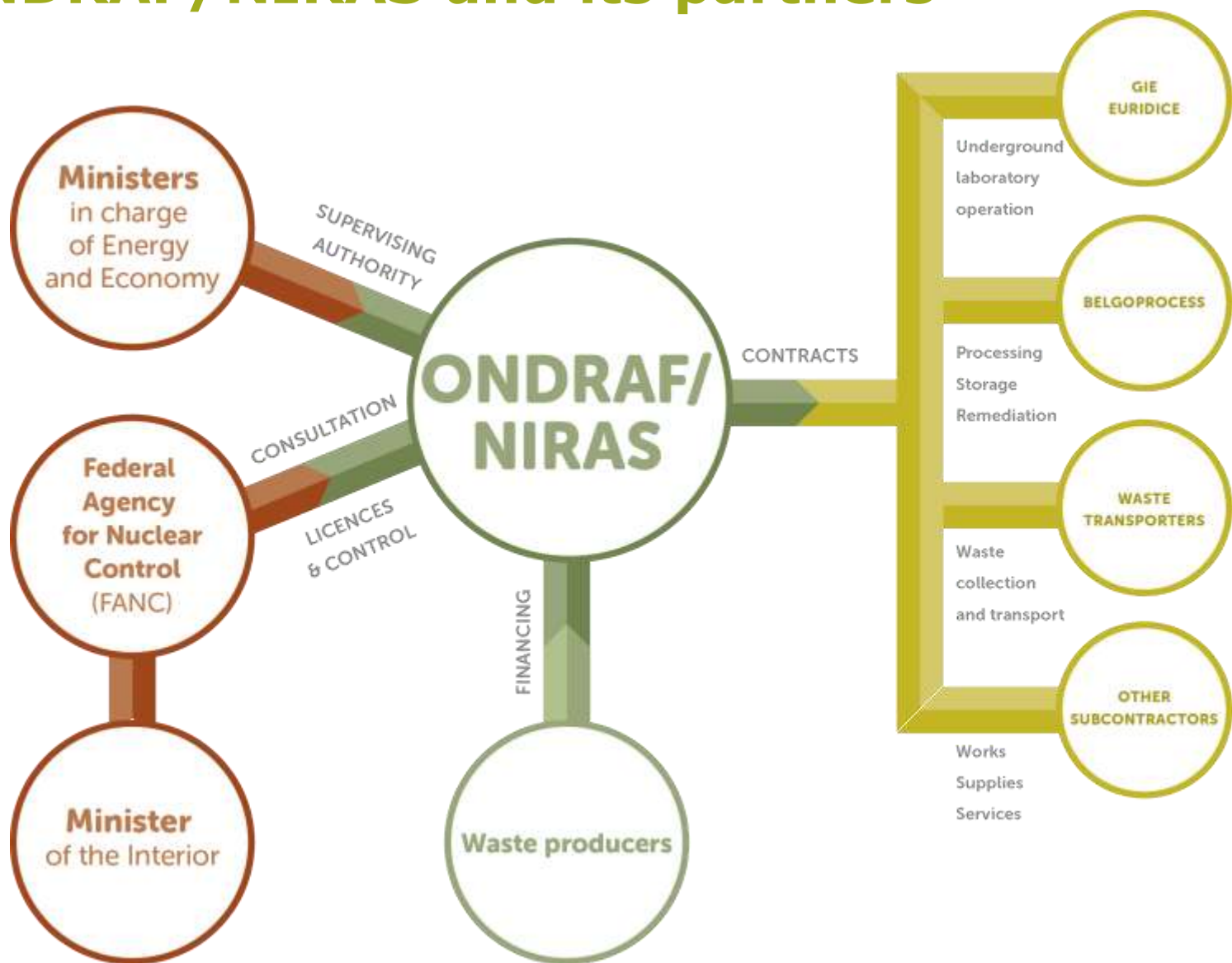
- Created by the law of August 8, 1980
- Supervising authority: Ministers for Economic Affairs and Energy



Our vision



ONDRAF/NIRAS and its partners



HOW DO WE MANAGE RADIOACTIVE WASTE?



Origins of radioactive waste

Electricity production by nuclear energy

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Nuclear power plant
operation



Nuclear fuel production



Nuclear fuel
reprocessing



Applications in research, medicine, industry and agriculture

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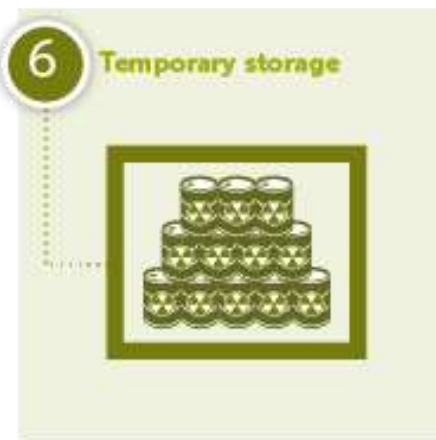
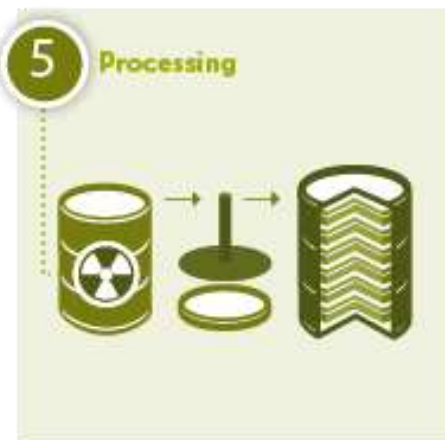
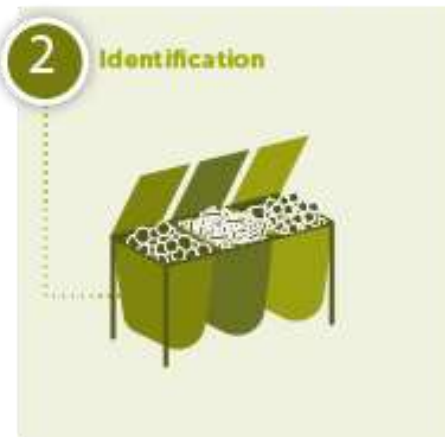
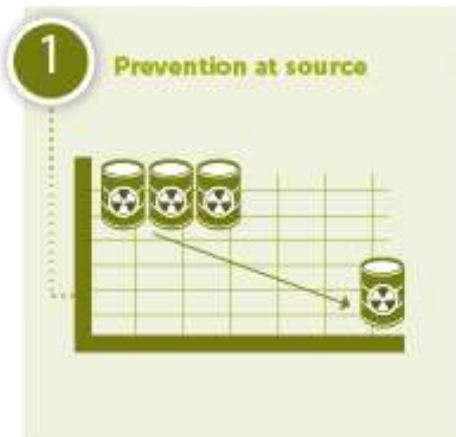
Dismantling of nuclear facilities

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Our waste management system

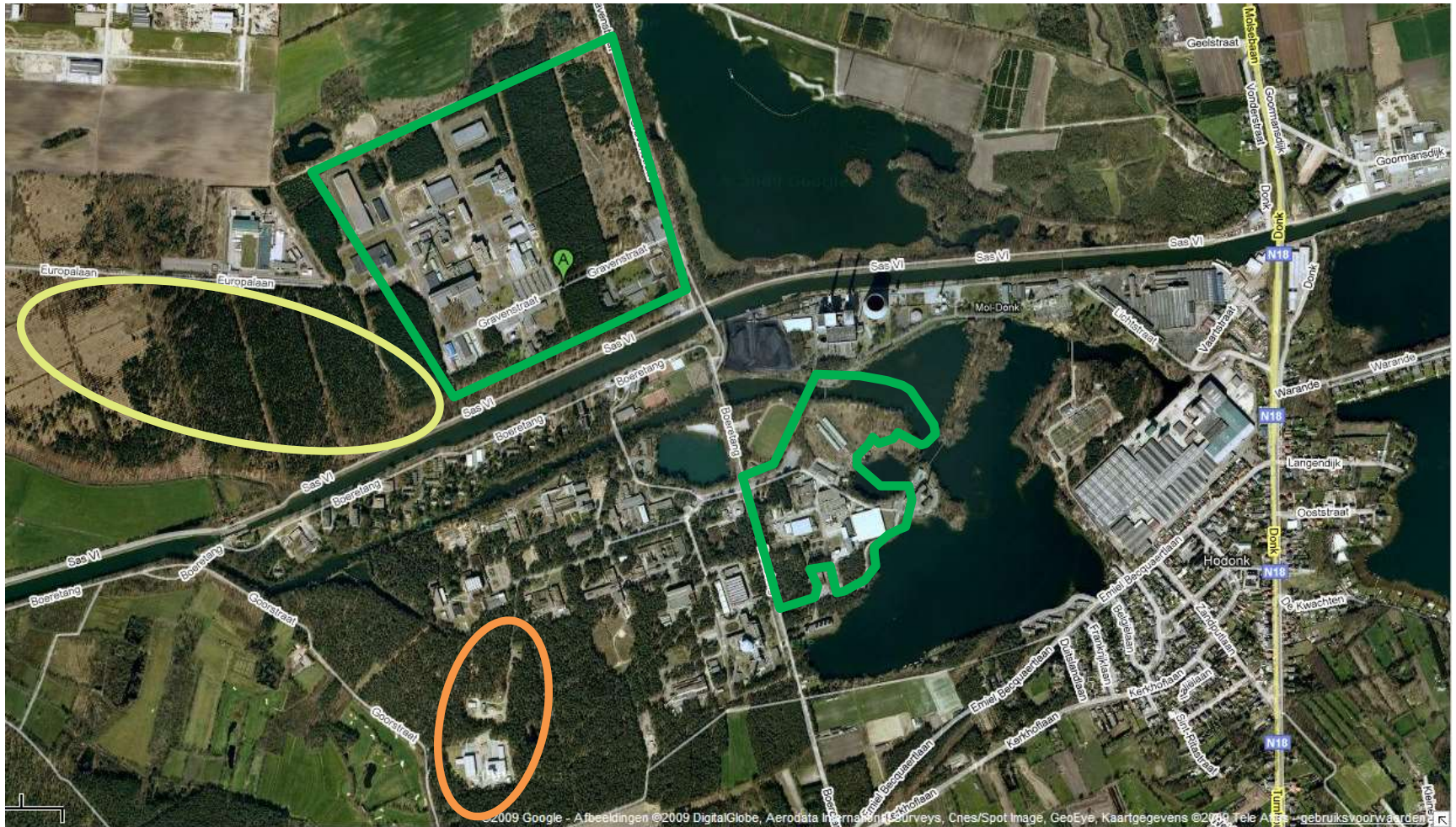
SHORT- AND MEDIUM-TERM WASTE MANAGEMENT



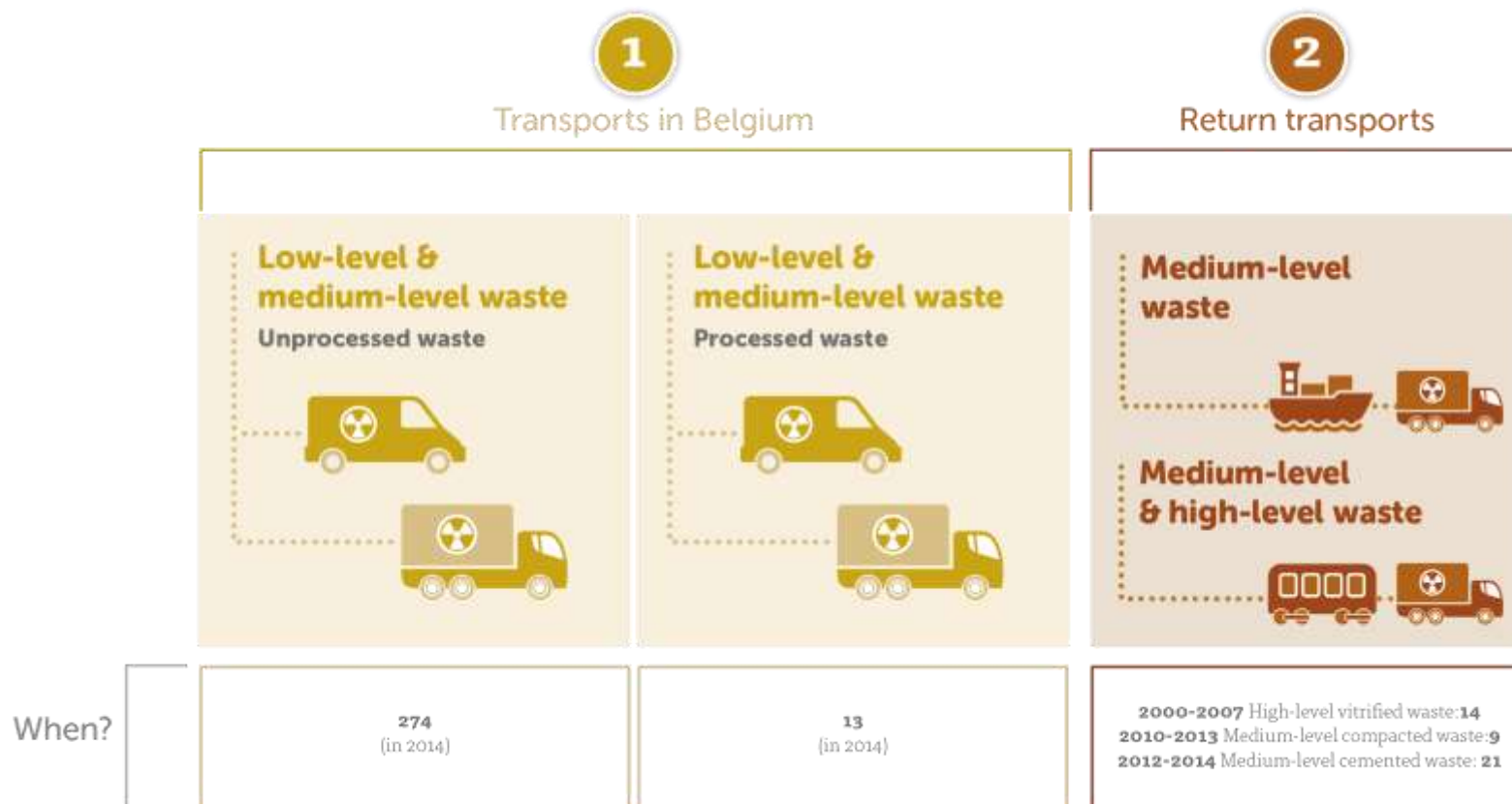
LONG-TERM WASTE MANAGEMENT



Location



Transport



Processing at Belgoprocess



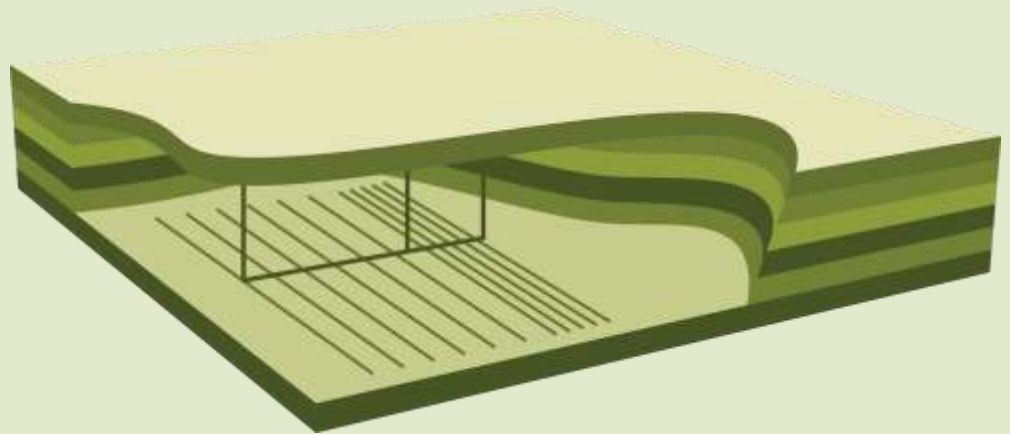
HOW DO WE MANAGE THE WASTE?

Storage



HOW DO WE MANAGE THE WASTE?

LONG-TERM WASTE MANAGEMENT



Long-term subdivision

	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

Volume	Category A ± 26.000 monoliths	Category B ± 4.500 à 5.000* monoliths	Category C ± 2.000* à 3.000 supercontainers
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*In case of full reprocessing

Frame of reference for long-term management

	Policy measures	Technical solution
Category A waste	Policy decisions January 1998 and June 2006	Surface disposal in Dessel
Category B&C waste	Policy decisions to be taken	Proposal ONDRAF/NIRAS: geological disposal in poorly indurated clay
Radioactive radium-bearing materials Radioactive (TE)NORM substances	1. Missing regulatory elements to define waste inventory 2. Waste Plan & SEA to be drawn up to compare possible management options and policy decision proposal	To be defined

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Co-design with local partnerships

- Local partnerships STORA (Dessel) and MONA (Mol) are **key partners** during the whole life span of the repository.
- All aspects of surface disposal are elaborated by co-design: **technical design + societal projects**



Path followed by short-lived waste

Temporary storage



IPM



Disposal modules



Two tumuli



Caisson plant



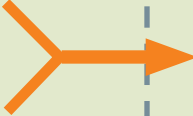
Monolith



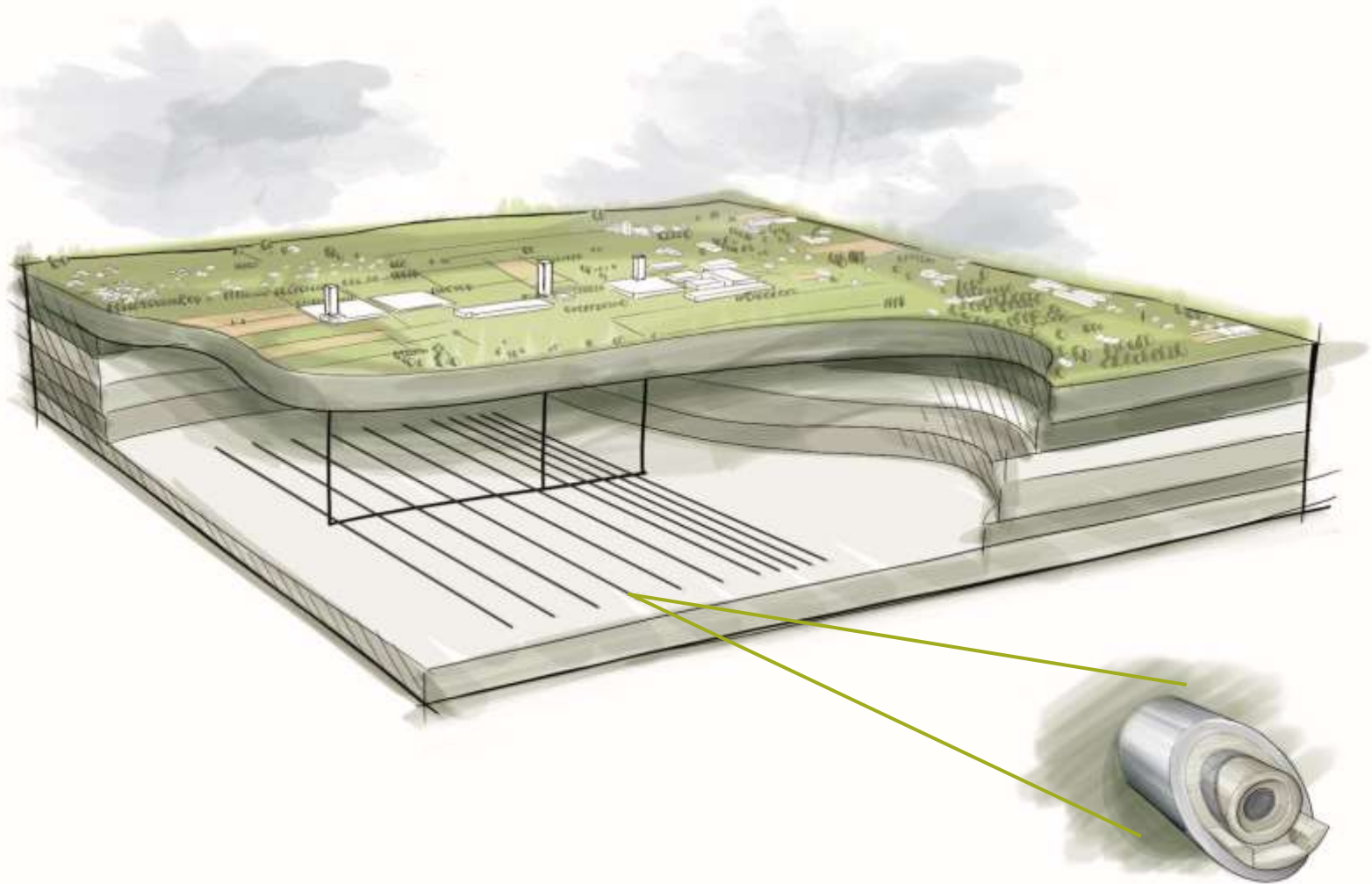
The near-surface repository



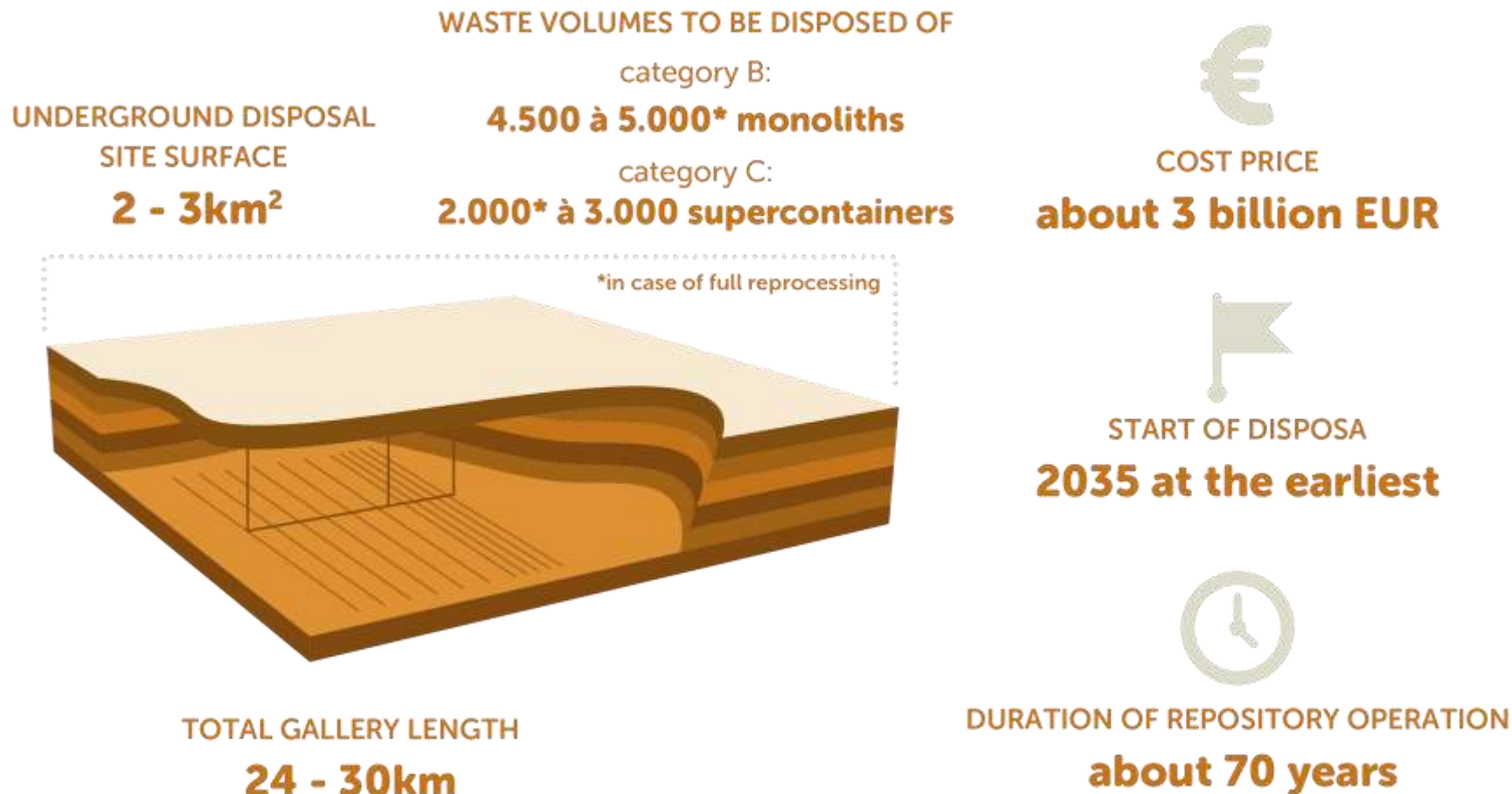
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Reference solution = geological disposal in clay

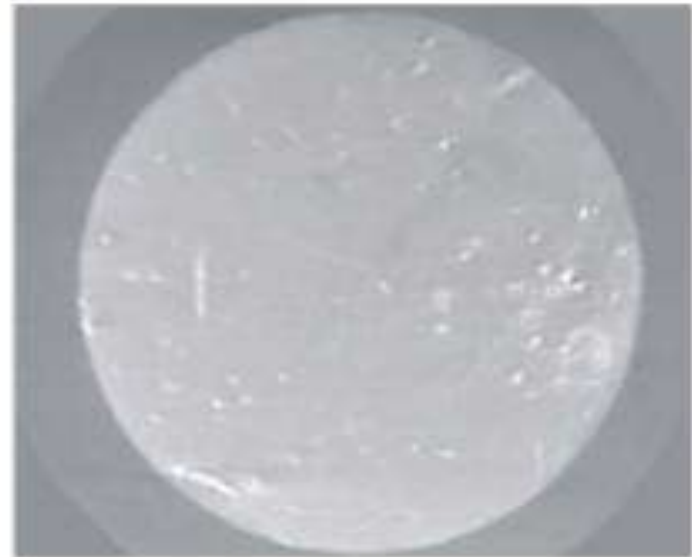
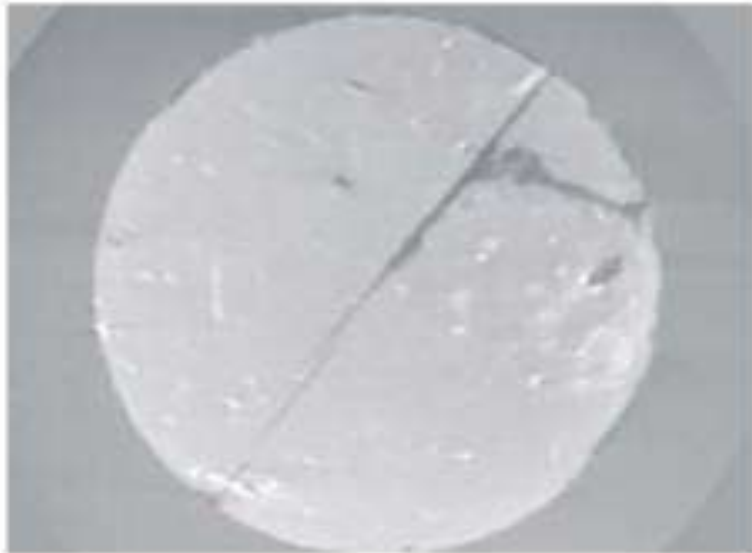


Footprint of geological disposal

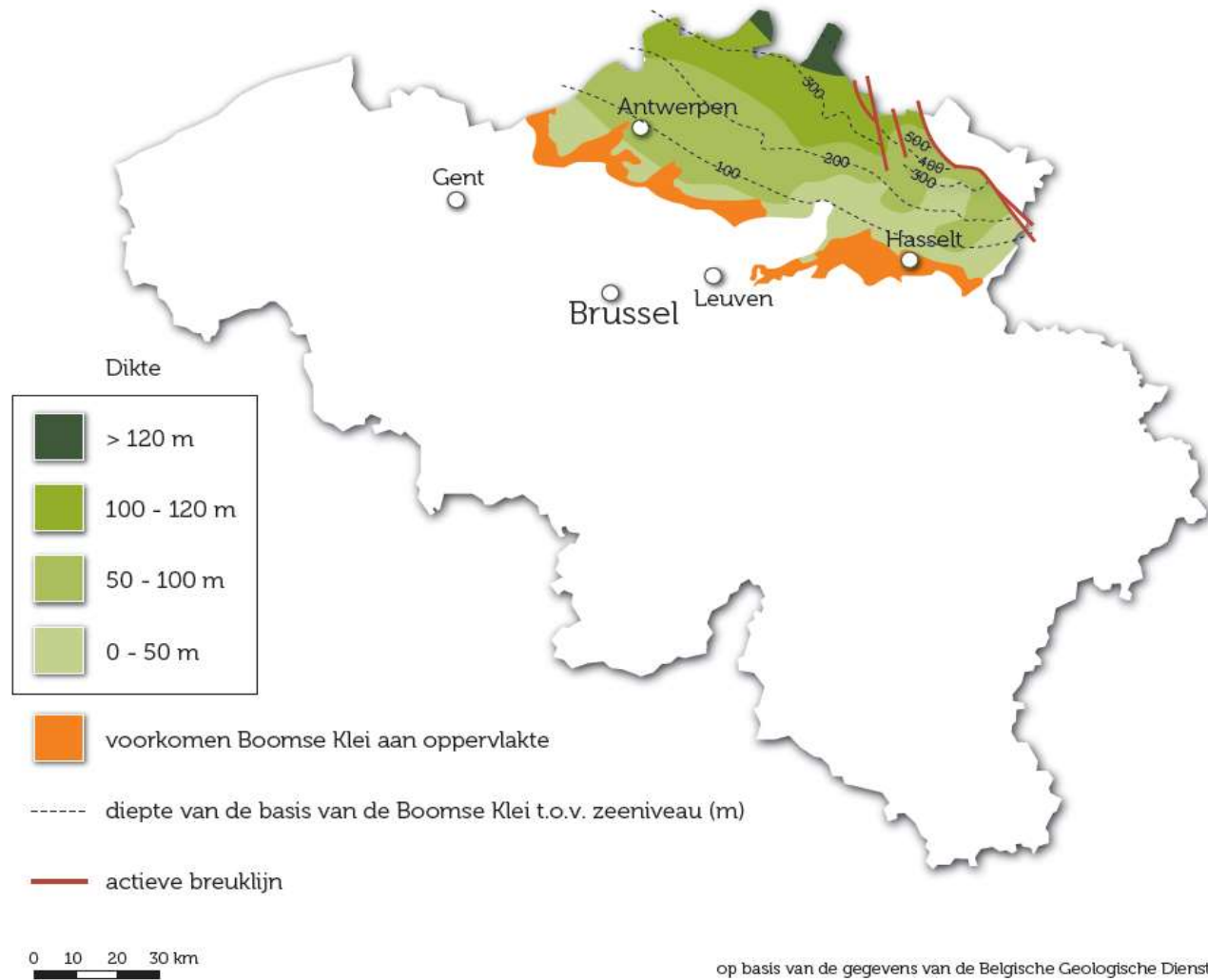


Waste disposal in clay: why?

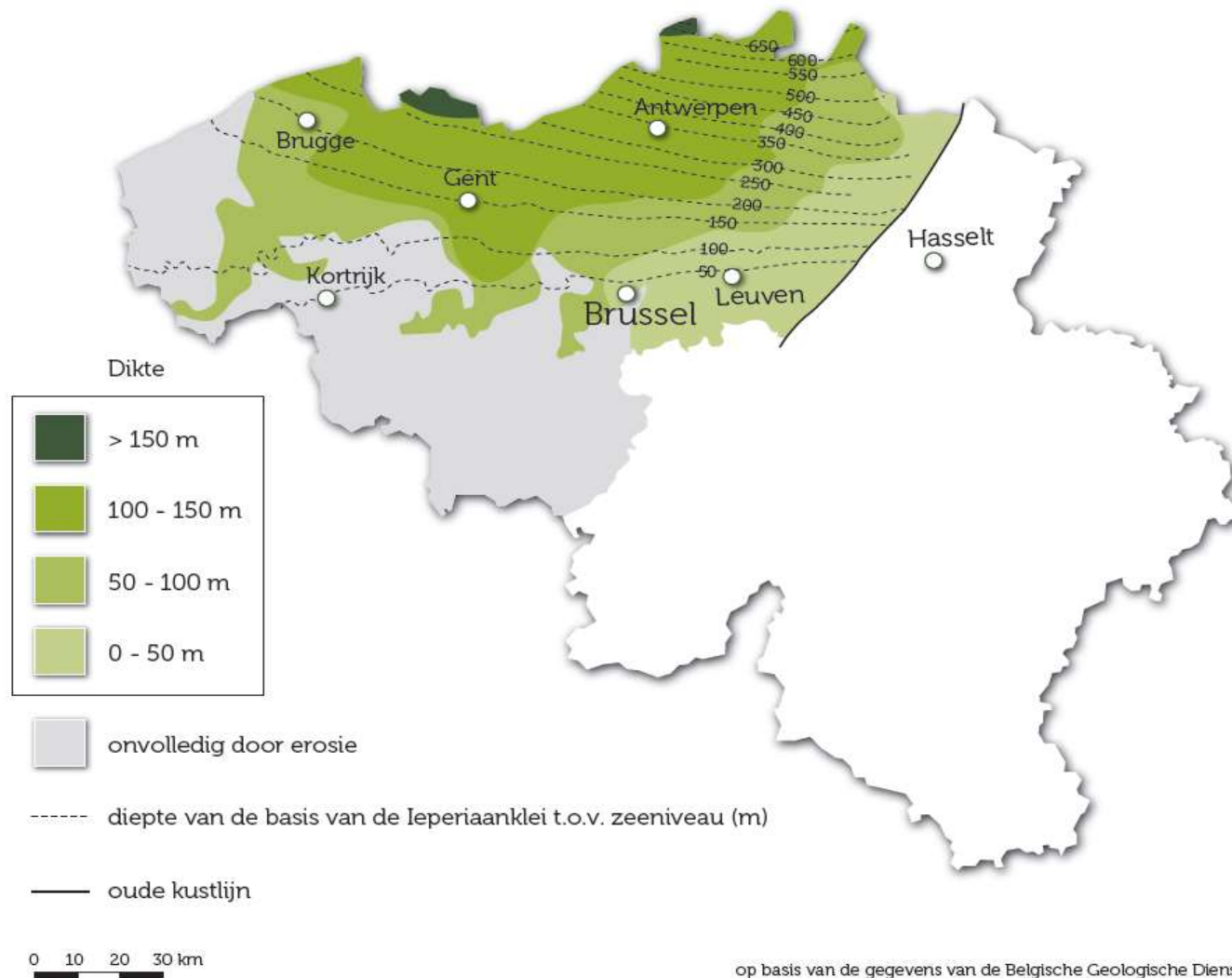
- Clay layers are stable in the long term
- Radioactivity moves very slowly through clay = retain + retardation of radioactivity dissemination
- Clay is self-healing



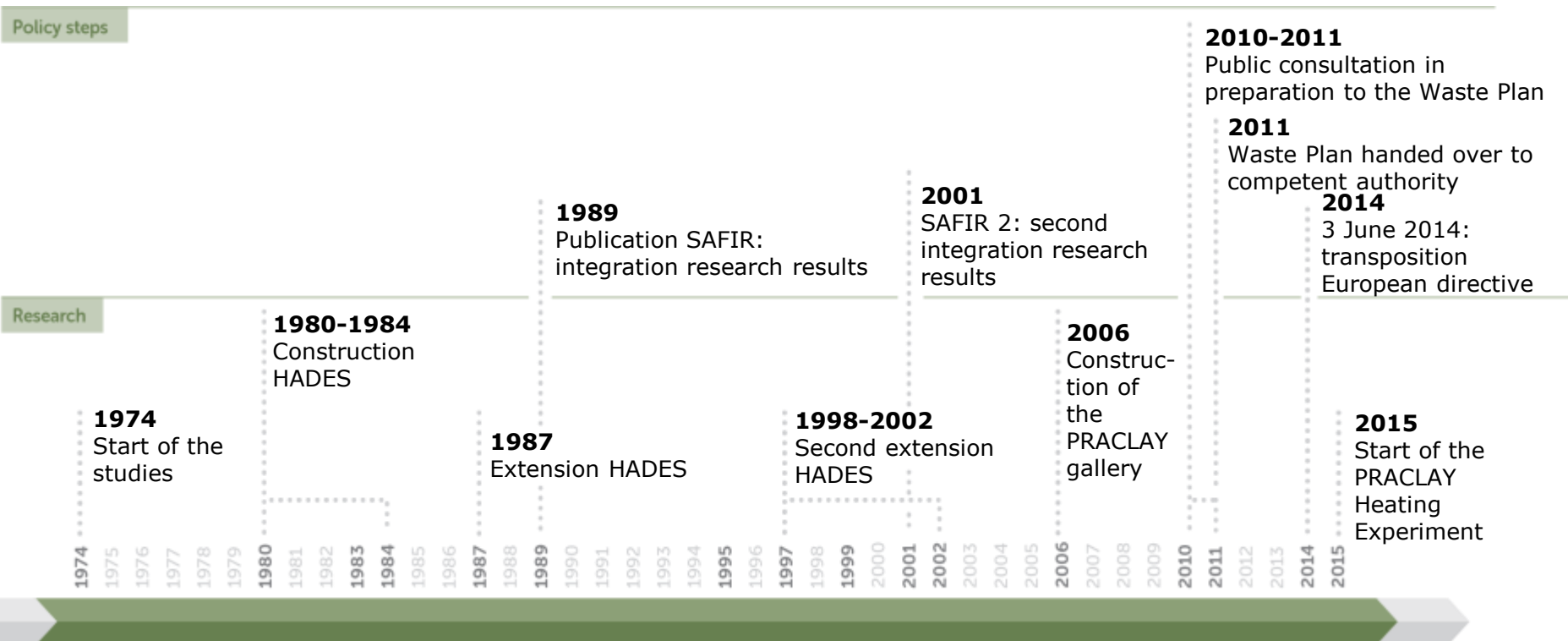
Boom Clay



Ypresian Clay



40 years of research



Current policy situation

Waste Plan 2011:

- Based on 40 years of research
- Strategic environmental impact assessment (SEA)
- Societal dialogue: public forum 2010 (with King Baudouin Foundation), legal public consultation 2010

26 September 2011: presentation Waste Plan to federal government

3 June 2014: Transposition European directive 2011/70/Euratom

ONDRAF/NIRAS to propose national policy for radioactive waste and spent fuel

May 2015: policy proposal based on Waste Plan



No decision taken yet

Gradual approach

Policy decision is first step towards geological disposal in poorly indurated clay

Next steps:

- Development of:
 - Reversibility
 - Retrievability
 - Monitoring
- Development of decision-making process
 - Gradual progress, participative, adaptable, transparent and credible
 - Ensure continuity (continuity of knowledge)