

Radioactive Waste Streams and corresponding waste classes

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ANDRA

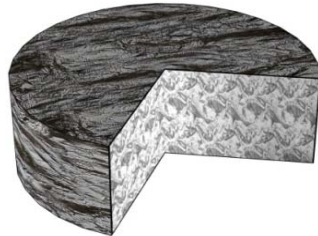


International Atomic Energy Agency Scientific Forum
**RADIOACTIVE WASTE:
MEETING THE CHALLENGE**
Science and Technology for
Safe and Sustainable Solutions
23–24 September 2014, Vienna, Austria

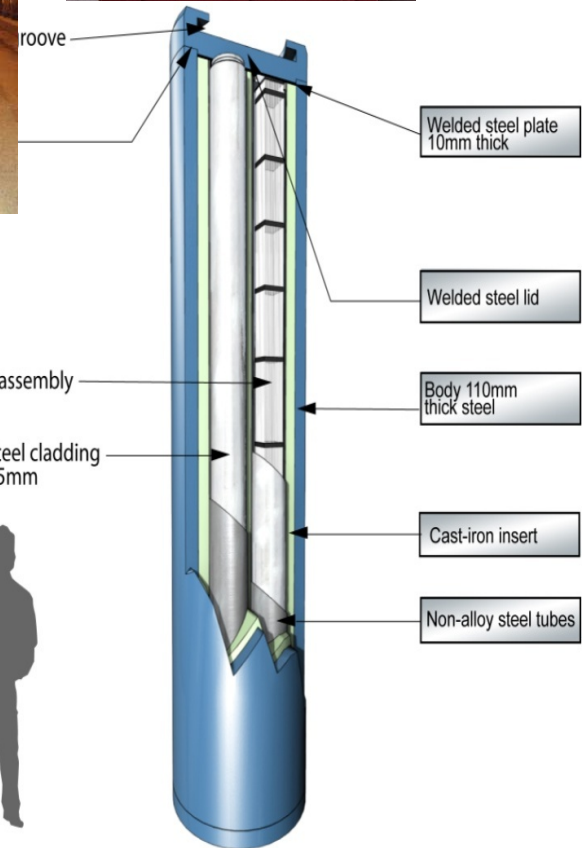
A great variety of waste forms



Zoom sur une galette de déchets technologiques

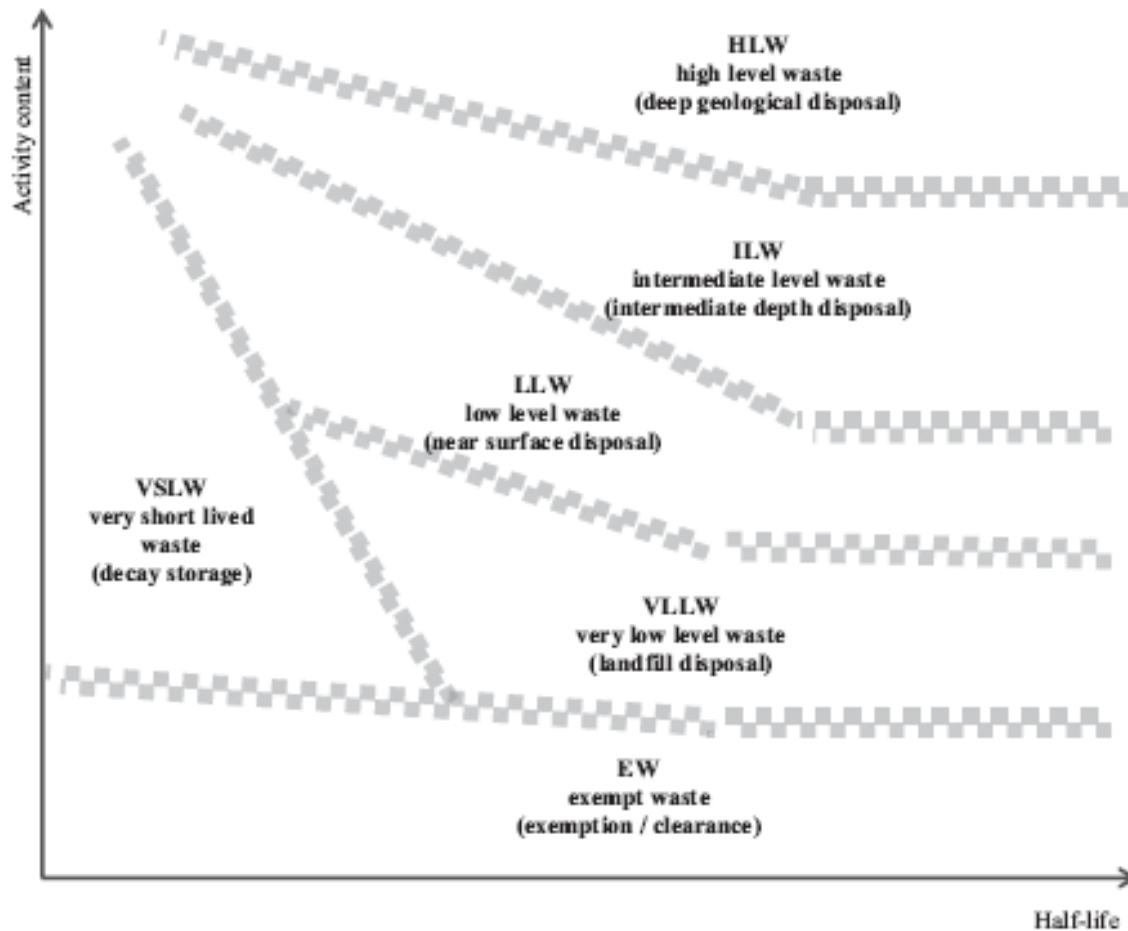


Zoom sur une galette de structure (coques et embouts)



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IAEA Waste Classification Guide (2009)



IAEA Safety Standards
for protecting people and the environment

Classification of
Radioactive Waste

General Safety Guide
No. GSG-1



Open cycle option

electricity



Technological, maintenance and process radioactive waste
~100 m³ / year)

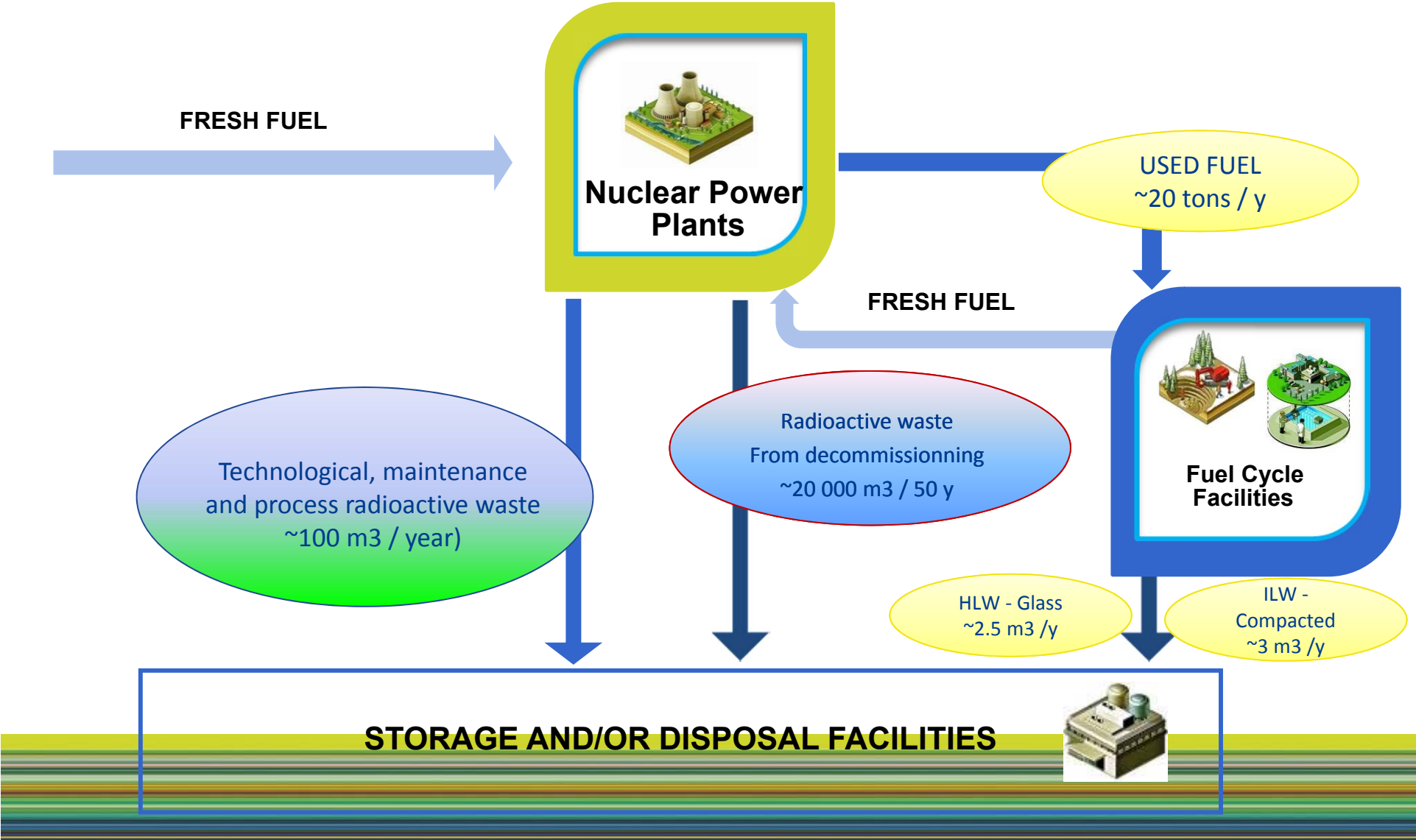
Radioactive waste
From decommissioning
~20 000 m³ / 50 y

SPENT FUEL
~20 tons / y



Closed cycle option

electricity



Overview of French radioactive waste classification

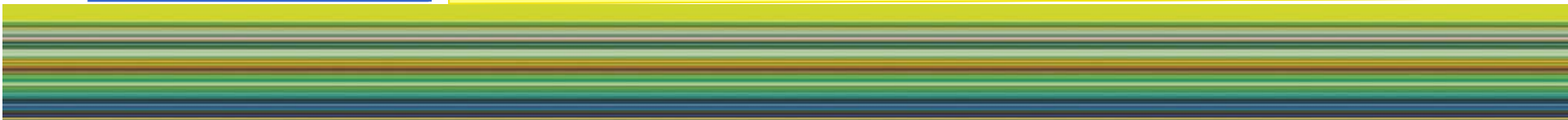
Short-lived waste

Period ≤ 31 years

Long-lived waste

Period > 31 years

<p>Very low level < 100 Bq/g, ~ 10 Bq/g</p>	<p>Waste mainly from dismantling operations (CIRES since 2003)</p>	
<p>Low level A few 10^5 Bq/g</p>	<p>Waste mainly from day-to-day operation of NPPs (CSM from 1969 to 1994) (CSA since 1992)</p>	<p>Graphite, radium-bearing waste (under development)</p>
<p>Intermediate level A few 10^8 Bq/g</p>	<p>Waste stemming from UF recycling (CIGEO geological disposal facility in France to be commissioned in 2025)</p>	
<p>High level $> 10^9$ Bq/g</p>		



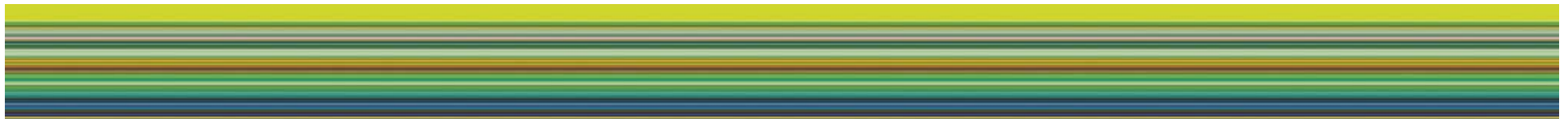
The National Inventory and the National Management Plan

Two essential and complementary tools for a clear management, rigorous, safe and consistent of all radioactive materials and waste



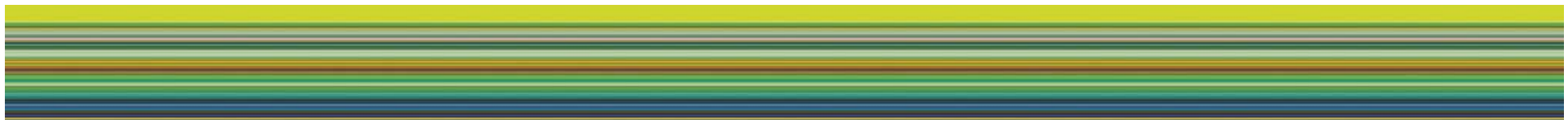
National Inventory objectives

- Inform in a transparent way
- Help anticipate management solutions and contribute to energy policy choices



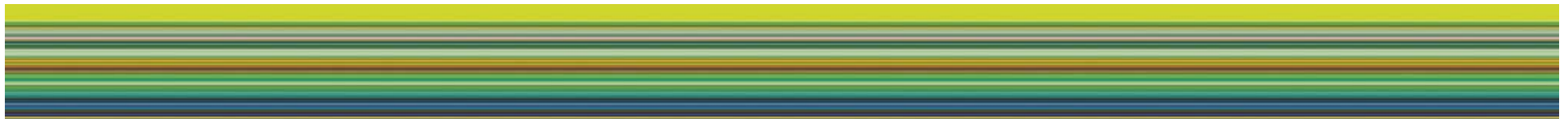
2012 National Inventory : existing inventory and forecast

Waste volume (m ³)	Waste at end-2010	Forecast end-2020	Forecast end-2030
HLW	2,700	4,000	5,400
ILW-LL	41,000	45,000	49,000
LLW-LL	87,000	89,000	133,000
LILW-SL	830,000	1,000,000	1,200,000
VLLW	360,000	750,000	1,300,000
Total	~1,320,000	~1,900,000	~2,700,000



The French National Plan for Management of Radioactive Materials and Waste (PNGMDR)

- Defined by the French law (2006 Planning Act) and updated every 3 years
- Major tool for the management of materials and waste
- Developed and maintained within a pluralistic working group
- Transmitted to Parliament, assessed by the Parliamentary Office of Science and Technology Options



Disposal facilities in France



Other disposal facilities (examples)



Spain



Sweden



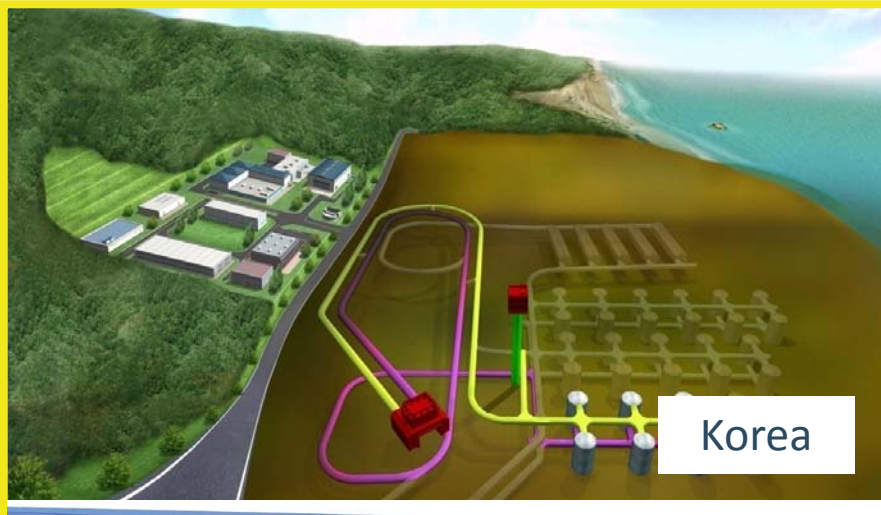
UK



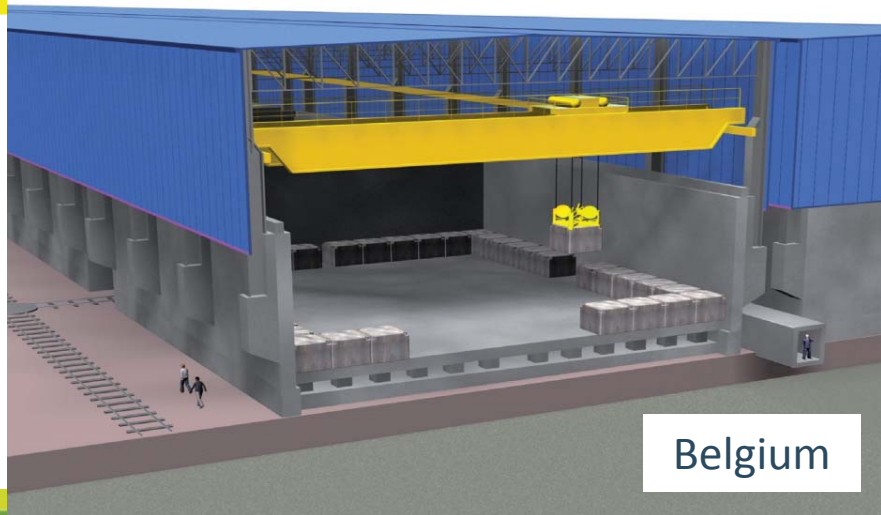
Hungary



Examples of projects for LILW



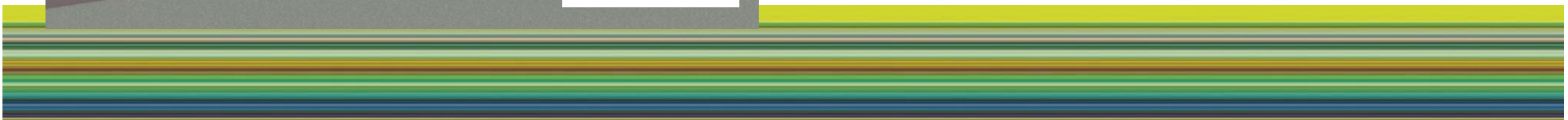
Korea



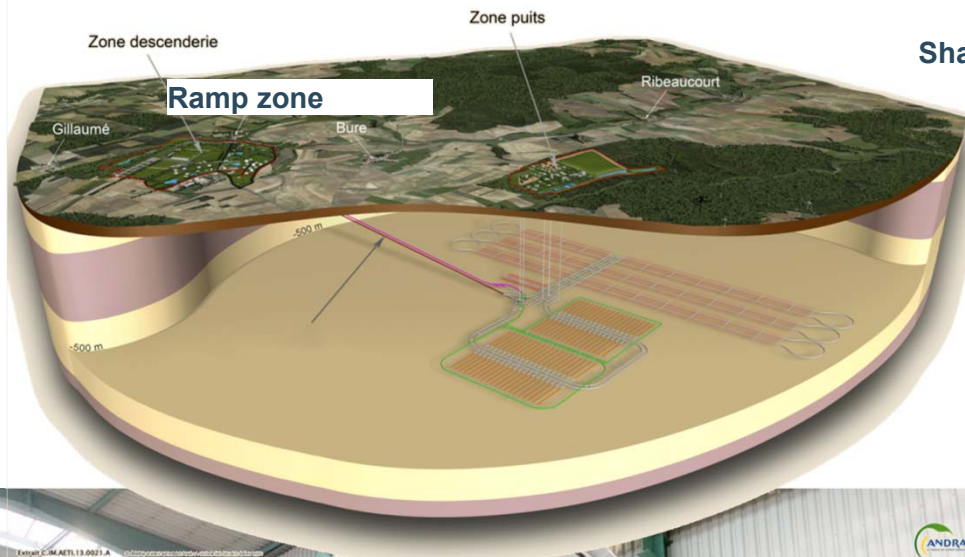
Belgium



Germany



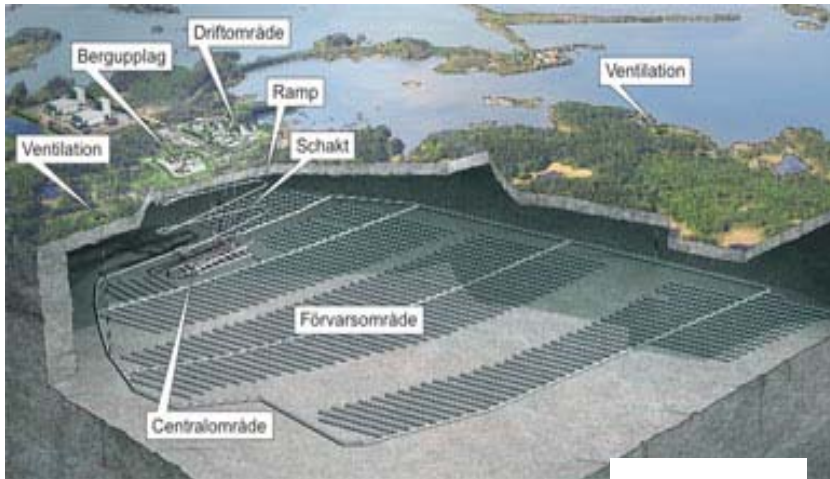
The Cigéo Project



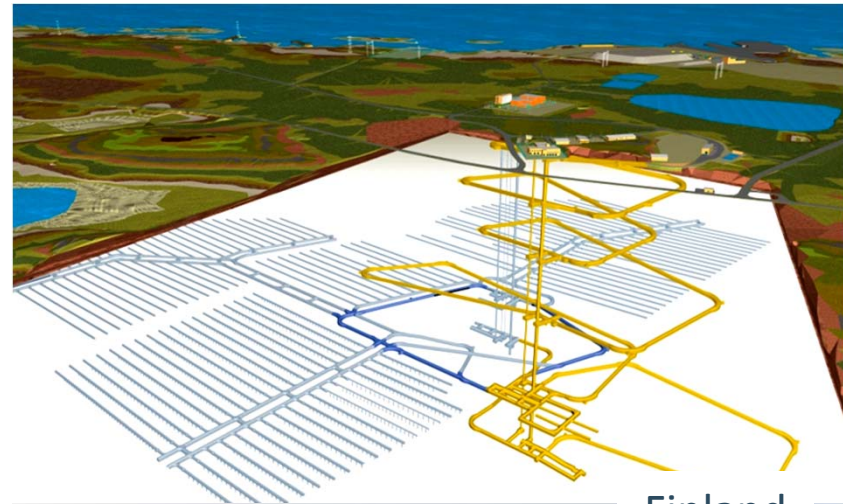
Shaft zone



Other projects for SF and/or HLW



Sweden

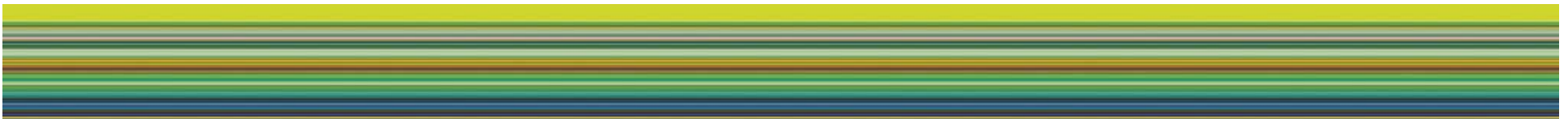


Finland



Conclusion

- Inventory
- Plan
- Research and development
- Industrial solution



THANK YOU

for your attention