Radioactive Waste Streams and corresponding waste classes

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ANDRA
A great variety of waste forms
Open cycle option

Nuclear Power Plants

FRESH FUEL →

Radioactive waste
From decommissioning
~20 000 m³ / 50 y

SPENT FUEL
~20 tons / y

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

STORAGE AND/OR DISPOSAL FACILITIES
Closed cycle option

electricity

FRESH FUEL

Nuclear Power Plants

Radioactive waste
From decommissioning
~20 000 m³ / 50 y

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

Radioactive waste
~2.5 m³ /y

HLW - Glass
~3 m³ /y

ILW - Compacted
~3 m³ /y

STORAGE AND/OR DISPOSAL FACILITIES
## Overview of French radioactive waste classification

<table>
<thead>
<tr>
<th>Short-lived waste</th>
<th>Long-lived waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period ≤ 31 years</td>
<td>Period &gt; 31 years</td>
</tr>
</tbody>
</table>

**Very low level**
- <100 Bq/g, ~10 Bq/g
- Waste mainly from dismantling operations
- (CIRES since 2003)

**Low level**
- A few 10^5 Bq/g
- Waste mainly from day-to-day operation of NPPs
- (CSM from 1969 to 1994)
- (CSA since 1992)

**Intermediate level**
- A few 10^8 Bq/g

**High level**
- > 10^9 Bq/g
- Waste stemming from UF recycling
- (CIGEO geological disposal facility in France to be commissioned in 2025)

**Graphite, radium-bearing waste**
- (under development)
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

The National Inventory

- identifies all stocks of radioactive materials and waste and provides forecasts
- feeds
- implements definitive solutions for all types of waste through agreed actions
- relies on the results of actions in the Plan

The National Management Plan

- monitors decided actions

The National Inventory and the National Management Plan work together to manage radioactive materials and waste effectively.
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

<table>
<thead>
<tr>
<th>Waste volume (m$^3$)</th>
<th>Waste at end-2010</th>
<th>Forecast end-2020</th>
<th>Forecast end-2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLW</td>
<td>2,700</td>
<td>4,000</td>
<td>5,400</td>
</tr>
<tr>
<td>ILW-LL</td>
<td>41,000</td>
<td>45,000</td>
<td>49,000</td>
</tr>
<tr>
<td>LLW-LL</td>
<td>87,000</td>
<td>89,000</td>
<td>133,000</td>
</tr>
<tr>
<td>LILW-SL</td>
<td>830,000</td>
<td>1,000,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td>VLLW</td>
<td>360,000</td>
<td>750,000</td>
<td>1,300,000</td>
</tr>
<tr>
<td>Total</td>
<td>~1,320,000</td>
<td>~1,900,000</td>
<td>~2,700,000</td>
</tr>
</tbody>
</table>
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)
Examples of projects for LILW

Korea

Belgium

Germany
The Cigéo Project

Ramp zone

Shaft zone
Other projects for SF and/or HLW

Sweden

Finland
Conclusion

- Inventory

- Plan

- Research and development

- Industrial solution
THANK YOU

for your attention