National waste disposal strategy/plans
(VLLW, LILW, High Level Waste, Disused Sealed Sources)

[DATEORIGINE]

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Contents

The past(1)

- ✓ On completion of initial analysis work the Government decided to initiate drafting of the National radioactive waste management plan.
- ✓ The Government gave the Nuclear Safety Authority (ASN) responsibility for organising this drafting.

An initial draft version was published on the ASN website in July 2005 for consultation purposes, during the course of the public debate on the subject of radioactive waste management, in anticipation of the legislative measures carried by the Act of 30 December 1991 concerning the fate of long-lived high-level waste.

The past (2)

- ✓ The Planning Act of 28 June 2006 confirmed the important role of such a plan.
- ✓ Law 2006-739 sets the following objectives for the plan :
  - » To draw up a balance on existing management measures of radioactive materials and waste,
  - » To make an inventory on foreseeable needs for storage and disposal,
  - » To indicate the necessary capacities for such installations and the duration of storage,
  - » To determine the objectives for the radioactive wastes for which a definitive management way does not still exist,
  - » To define research programs to be conducted for new solutions.
- ✓ **Law stipulates also that :**
  - » The national plan is established and updated every three years, based on the national inventory
  - » It is transmitted to Parliament which brings it before the Parliamentary Office for Science and Technology Assessment for assessment, and disclosed.

The EC directive (1)

- ✓ The Waste Directive of 19 July 2011 establishes strong legally binding rules for the responsible and safe management of spent fuel and radioactive waste. It ensures that all Member States define and implement in a transparent manner measures, without undue delay, for the management of their radioactive wastes.
- ✓ Scope of the Directive :
  - » Spent fuel and radioactive waste from civilian activities,
  - » All stages of management – from generation to disposal.
- ✓ Subject matter and Objectives :
  - » National arrangements for a high level of safety,
  - » Avoiding undue burdens on future generations,
  - » Effective public participation in the decision making.

The EC directive (2)

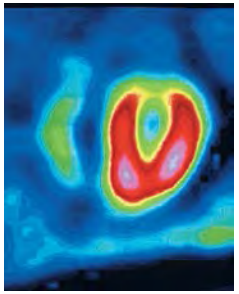
- ✓ Establishment and implementation of national programmes which content :
  - ✓ Objectives of national policy
  - ✓ Milestones and timeframes
  - ✓ Inventory and estimated future quantities
  - ✓ Technical solutions from generation to disposal
  - ✓ Research, development and demonstration
  - ✓ Key performance indicators
  - ✓ Cost estimates and financing scheme
  - ✓ Transparency policy

Current PNGMDR (1)

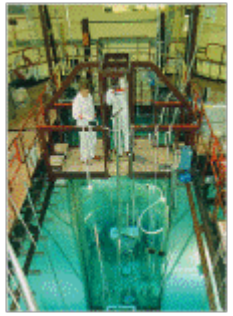
All types of radioactive materials and waste are considered

Defense sector

Medical sector



Research sector



Electronuclear sector

nuclear power plants
plants of the fuel cycle front end
plants of the cycle back end

Non electronuclear industry sector :

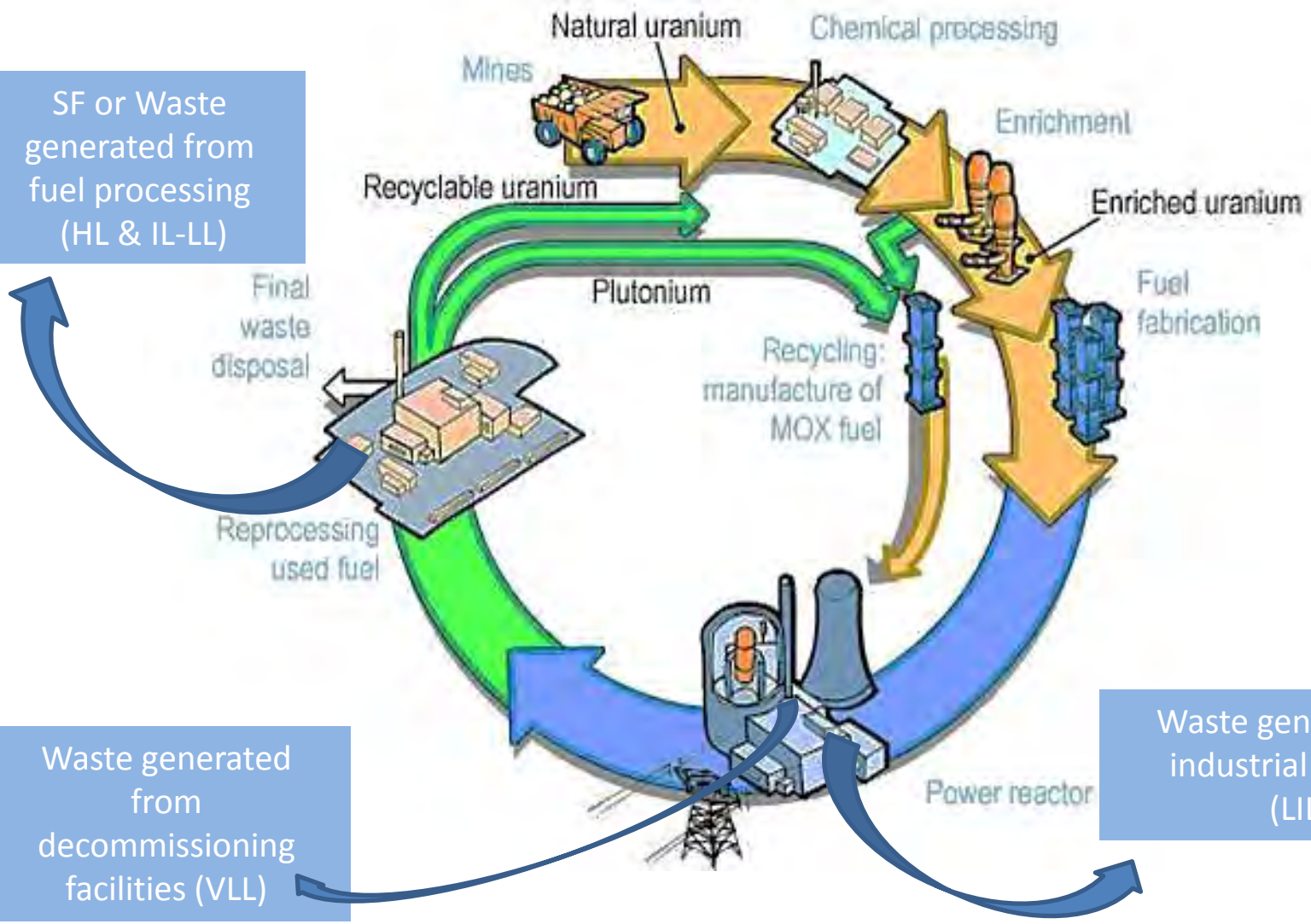
extraction of rare earths,
fabrication and utilization
of sealed sources

Current PNGMDR (2)

- ✓ IMPROVING THE MANAGEMENT OF RADIOACTIVE MATERIALS AND WASTE
  - » The storage of radioactive materials and waste
  - » The long-term management of reusable materials
  - » Long-term waste management : disposal centres dedicated to radioactive waste
  - » Long-term waste management : other existing management methods routes
  - » Long-term waste management : the new solution routes
  - » Improving the global consistency of the management of radioactive materials and waste

The electronuclear fuel cycle and related radioactive waste

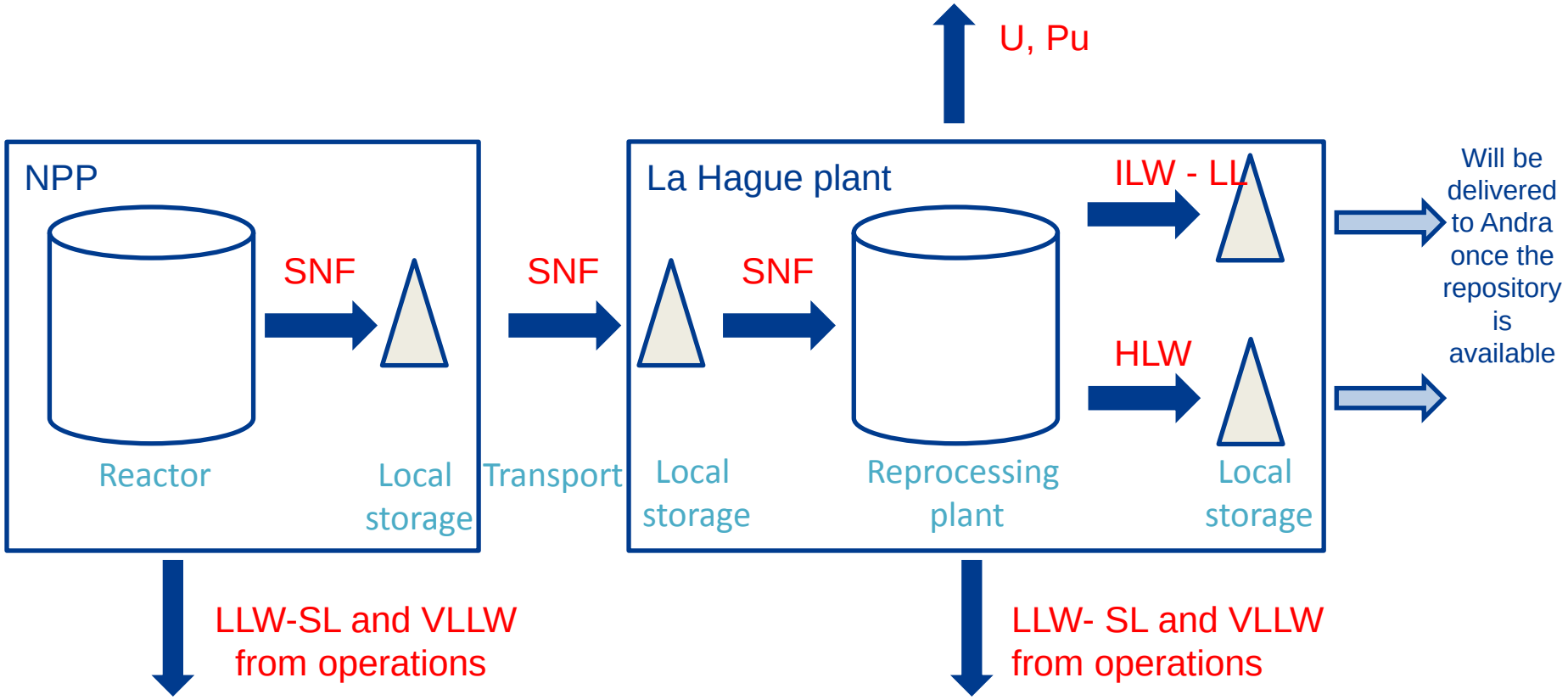
SF or Waste generated from fuel processing (HL & IL-LL)



Waste generated from decommissioning facilities (VLL)

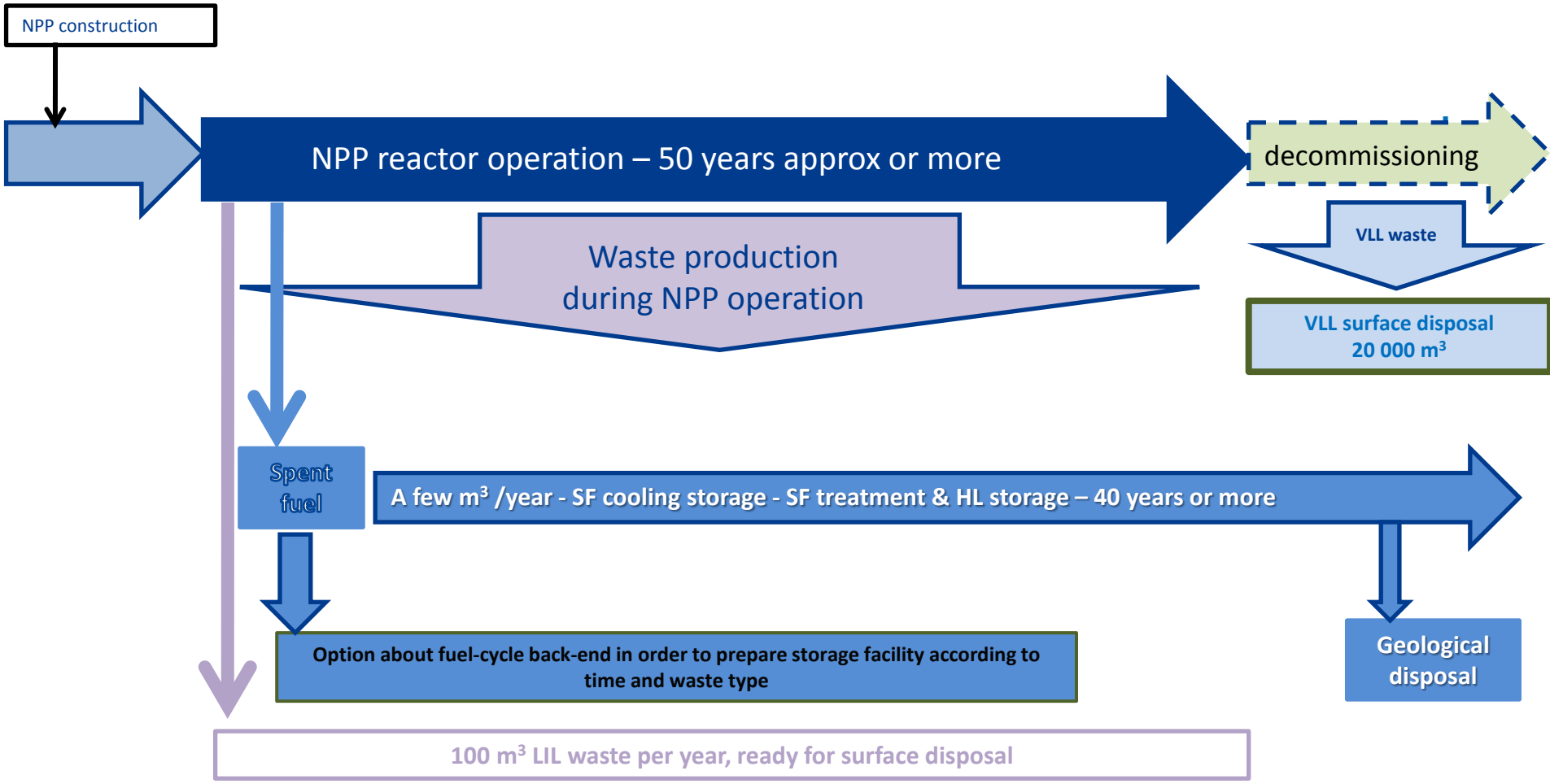
Waste generated from industrial operations (LIL-SL)

How it works



This waste is sent by road and rail to Andra's operational facilities

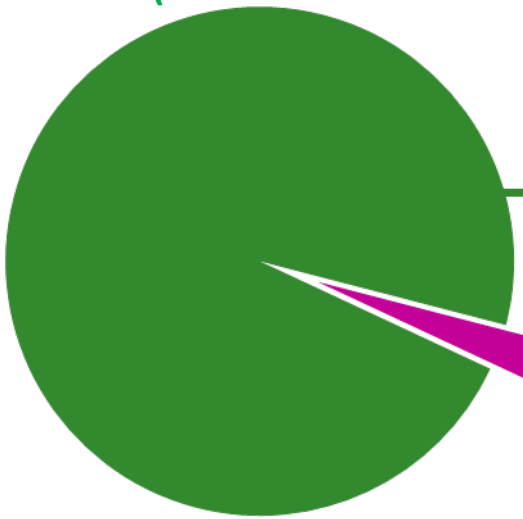
Waste management agenda



Bases for a management strategy

Waste volumes : approx 100 m³per year

- **Operation & maintenance (LIL waste)**
- **SF reprocessing (HL waste)**
- Dismantling: 20 000 m³



To be disposed of as from reactor commissioning

To be disposed of beyond some 40 years

To be disposed of after some 60 years

Disused sealed sources in France

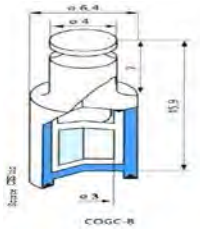
Inventory of 2 millions of DSRS :

- 65% : Ionising smoke detectors' sources
- 22% : sources used for defence purposes
- 10,3 % : industrial sources stored by CEA and Cis-Bio
- 1,3% : industrial and medical sources stored by ANDRA

After recovery of a sealed source by the initial supplier or by any other licensee :

- *A recovery certificate is issued*
- *A decision is taken to recycle the source or to manage the source as a radioactive waste*
  - » *Reuse or Recycling possibility relies on technical and economical criteria*
  - » *Framework to take a decision for reuse or recycling is not explicitly defined in the regulation (time limit to take a decision?)*
- *Radioactive waste must be classified in the waste management system*
  - » *stored radioactive materials are not considered as waste as long as they have a potential for future use*

Long-term exposure scenari



Specific risk of DSRS compared to other radioactive waste

Intrusion in the repository after loss of memory (After at least 300 years)

Source recovery

Scenarios

Ingest

Take in pocket

Use as a trinket

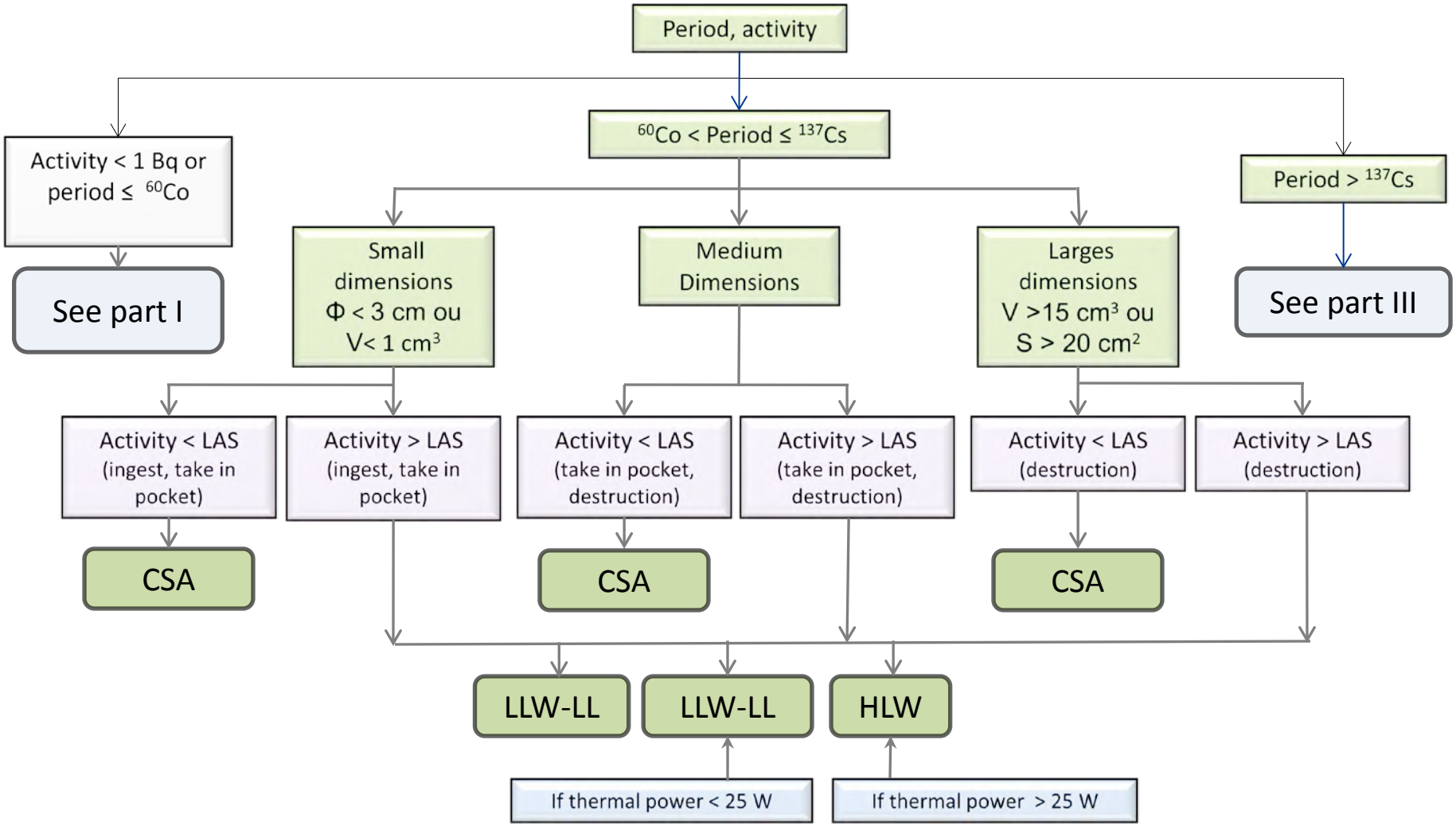
Destroy

The consistency of the scenarios is related to source dimensions

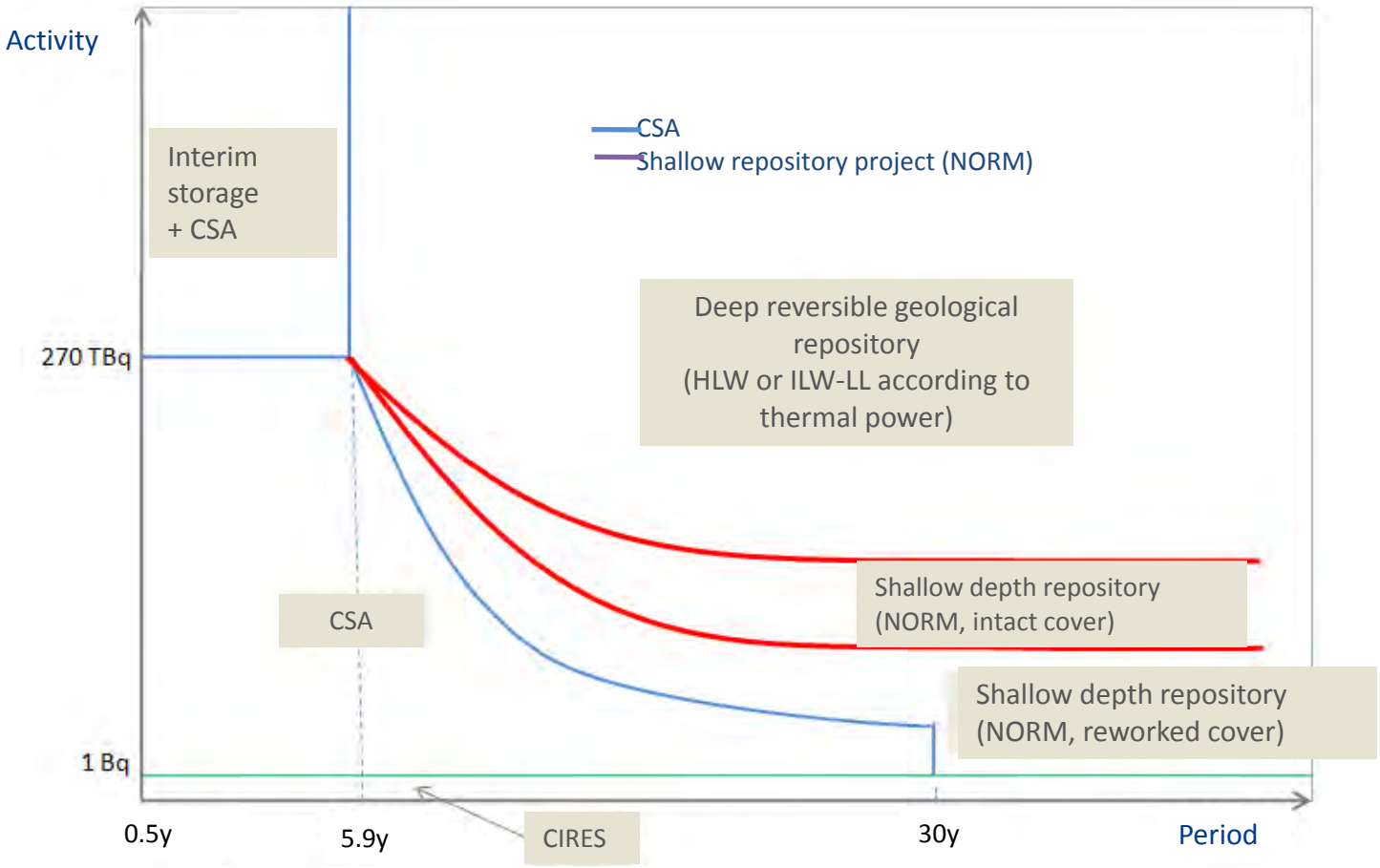
Source activity limit

LAS is the source activity at the time of its emplacement in the repository, beyond which the radiological exposure in the event of a recovery (after 300 years for CSA) will not be acceptable.

Management routes for sources (1)



To summarize for sources



To summarize

The VLLW (dismantling) will go to the CIRES. A new facility will be needed as from 2030. The high amount of dismantling will appear at this stage.

The L&ILW-SL (operational, research) will be disposed of at the CSA. The current figures show total occupation by 2070.

The LL-LL (dismantling, industrial) willl go to the facility when it is available (2020's)

The ILW-LL (reproccesing, research) will go to the Cigèo installation by 2030.

The HLW (reproccesing, research) will go to the Cigèo installation by 2070.

Depending on their characteristics, sources will be dispatched accordingly.

Thank you