



PRESS RELEASE

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PUBLIC BODIES AND POLICIES

THE BACK END OF THE NUCLEAR FUEL CYCLE

Radioactive materials and waste, from reactor exit to disposal

The Court, which has already dedicated several reports to the nuclear power sector, analyses the back end of the nuclear fuel cycle, from reactor exit to disposal, through interim storage and, where applicable, reprocessing.

The volume of materials and waste involved, the risks of saturation of certain interim storage facilities, the prospects for filling existing storage facilities, the costs associated with their management and the Cigéo underground disposal project, and the impact of energy policy decisions on the back end of the nuclear fuel cycle are all issues to be addressed in the ongoing public debate on the fifth Radioactive Materials and Waste Management Plan (*plan national de gestion des matières et déchets radioactifs*).

The Court's findings and recommendations aim to increase transparency on this subject and to provide a better understanding of costs.

Significant volumes of radioactive materials and waste to be managed

Between 2010 and 2016, an average of 1,141 tonnes of nuclear fuel was loaded each year into French reactors, 10% of which was derived from the recycling of spent MOX fuel. 3,600 m³ of high-level waste – representing 95% of the total radioactivity and 0.2% of the volume of waste in France – and 45,000 m³ of intermediate-level long-lived waste are provisionally stored at the La Hague, Marcoule, Cadarache and Valduc nuclear sites, and are intended for underground disposal at the Bure site as part of the Cigéo project. 90,500 m³ of low-level long-lived waste are stored at the producers' interim facilities, without any disposal solution. Nearly one million m³ of intermediate and low-level short-lived waste – representing nearly 60% of the total volume of waste but only 0.03% of the total radioactivity – is stored at the producers' interim facilities or disposed of at the disposal centres of the National Agency for Radioactive Waste Management (*Agence nationale pour la gestion des déchets radioactifs* – ANDRA). Finally, nearly 500,000 m³ of very low-level waste is stored at the producers' facilities and disposed of by ANDRA.

The capacities and costs of the interim storage and disposal of radioactive substances

Current storage capacities for very low-level waste (inert waste, rubble, concrete, earth, etc.) should, under unchanged regulations, be fully used around 2029. Storage capacities for intermediate and low-level short-lived waste (tools, clothing, etc.) are not at risk of saturation. On the other hand, storage capacities for high-level and intermediate-level long-lived waste (e.g. metal structures surrounding spent fuel) may be under strain, pending disposal in Cigéo.



In terms of the different types of spent fuel, they are stored in pools pending subsequent reuse. Storage capacities should be filled between 2025 and 2030, and there is a real risk of saturation.

The average operating costs of disposal and interim storage facilities are €137.7 million per year on average. Cumulative investments in these facilities between 2014 and 2017 amounted to €255 million, but could reach nearly €1.4 billion between 2018 and 2030, and increase by a further €1.5 billion between 2030 and 2050. Furthermore, deterioration in the storage conditions of old waste requires the recovery and reconditioning of this waste for disposal, at an estimated total cost of €7.8 billion. Finally, the cost of the Cigéo project (270 km of buried galleries 500 m underground) was set by decree at €25 billion, but it should be updated on a regular and realistic basis and estimated for all radioactive waste management scenarios.

Refining the framework for the management of radioactive materials

Operators bear the costs of managing radioactive materials and waste and must make provisions to meet future costs and not pass them on to future generations. In some cases, these provisions will be secured by dedicated assets as an additional guarantee.

In the case of radioactive materials, the amount of provisions to be made and whether dedicated assets should be established must be based on an in-depth analysis of the real industrial prospects for the reuse of these materials. As such, the large volume of the existing stock of reprocessed uranium raises questions about the operators' ability to reuse this stock in its entirety and about the accounting decisions made today.

Operators' financial decisions must also be based on a more precise doctrine for classifying radioactive substances according to whether they are reusable (materials) or not (waste). It is the responsibility of the administrative authority, in conjunction with operators, to propose such a doctrine in order to reinforce the conservative nature of financial and accounting decisions.

The back end of the cycle and the evolution of energy policy

The entire nuclear fuel cycle is characterised by a balance based on the use of MOX fuel and any decision on the operation of power plants has a direct impact on the management of materials and waste. For example, the closure of a significant number of 900 MW reactors using MOX would lead to saturation of the interim storage pools – unless other reactors, the 1,300 MW reactors, were modified to be able to consume MOX.

These interactions between the front end and back end of the nuclear fuel cycle, as well as their economic, environmental and budgetary consequences, must be fully integrated and made explicit in public debates on Multiannual Energy Programming (*programmation pluriannuelle de l'énergie*) and the National Plan for the Management of Radioactive Materials and Waste. The various programming documents should take these parameters into account and make them consistent in order to enable operators to properly adjust investments to be made in the coming decades.

The Court makes ten recommendations to this effect.

[Read the report](#)

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