

Funding Mechanisms for Radioactive Waste Management

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**RADIOACTIVE WASTE:
MEETING THE CHALLENGE**

Science and Technology for
Safe and Sustainable Solutions

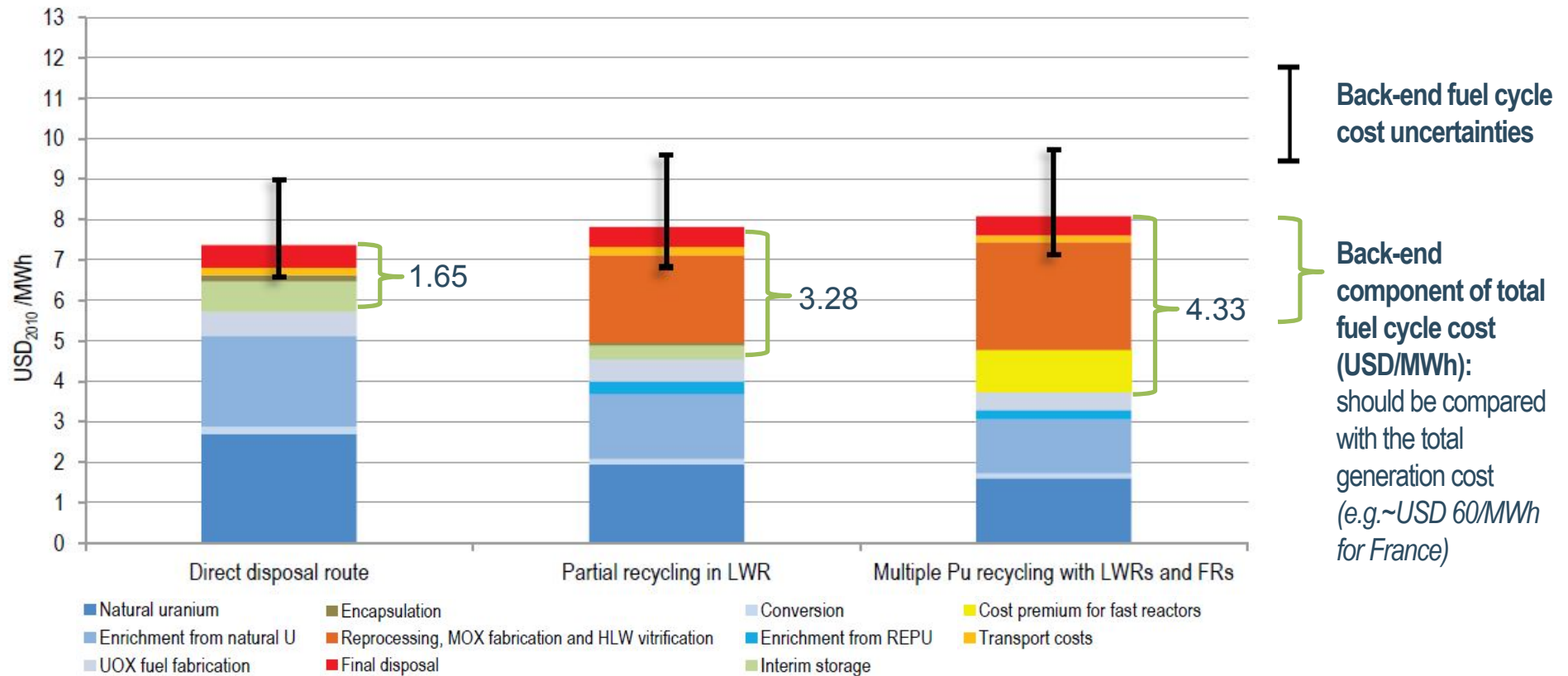
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Managing spent nuclear fuel

- Two major options are currently applied to manage spent fuel:
 - **Direct disposal:** nuclear fuel is used once and is then stored in anticipation of disposal.
 - **Partial recycling:** the spent fuel is reprocessed to recover uranium and plutonium that may be fabricated into new fuel for light water reactors.
- Both options, as well as any prospective advanced recycling, eventually entail the use of an **operational repository for final disposal.**

Example of fuel cycle cost breakdown for different spent fuel management strategies

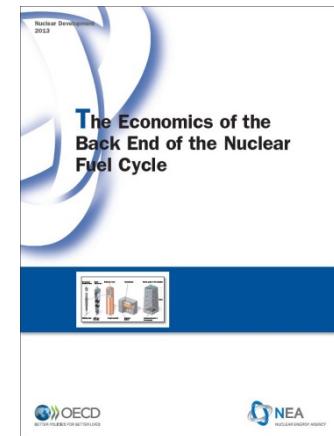
(Capacity: 75 TWh/year, discount rate 3%)



Source: OECD/NEA, *Economics of the Back-end of the Nuclear Fuel Cycle*, 2013.

Requirements and features of RWM financing (1/3)

- To establish the size of liabilities and guarantee adequate financing, periodic assessments of the costs of managing radioactive waste are essential.
 - Cost assessments are performed regularly in most countries.
- Expenses for disposal will appear over extended periods, and much of the expenditure could incur long after income from electricity generation has stopped.
 - It is fundamentally important that appropriate financial arrangements are established and that the accrual of adequate and available funds for the implementation of the selected back-end strategy is carefully pursued and monitored.



Requirements and features of RWM financing (2/3)

- The most common mechanism adopted for the accrual of funds are **levies** on nuclear electricity.
- In some cases, waste producers can pay **lump sums** (e.g. in the Republic of Korea) or **proportionally** to the volumes of waste produced (e.g. in Belgium).
- The payments of fees and levies are accumulated in **internal or external funds**.

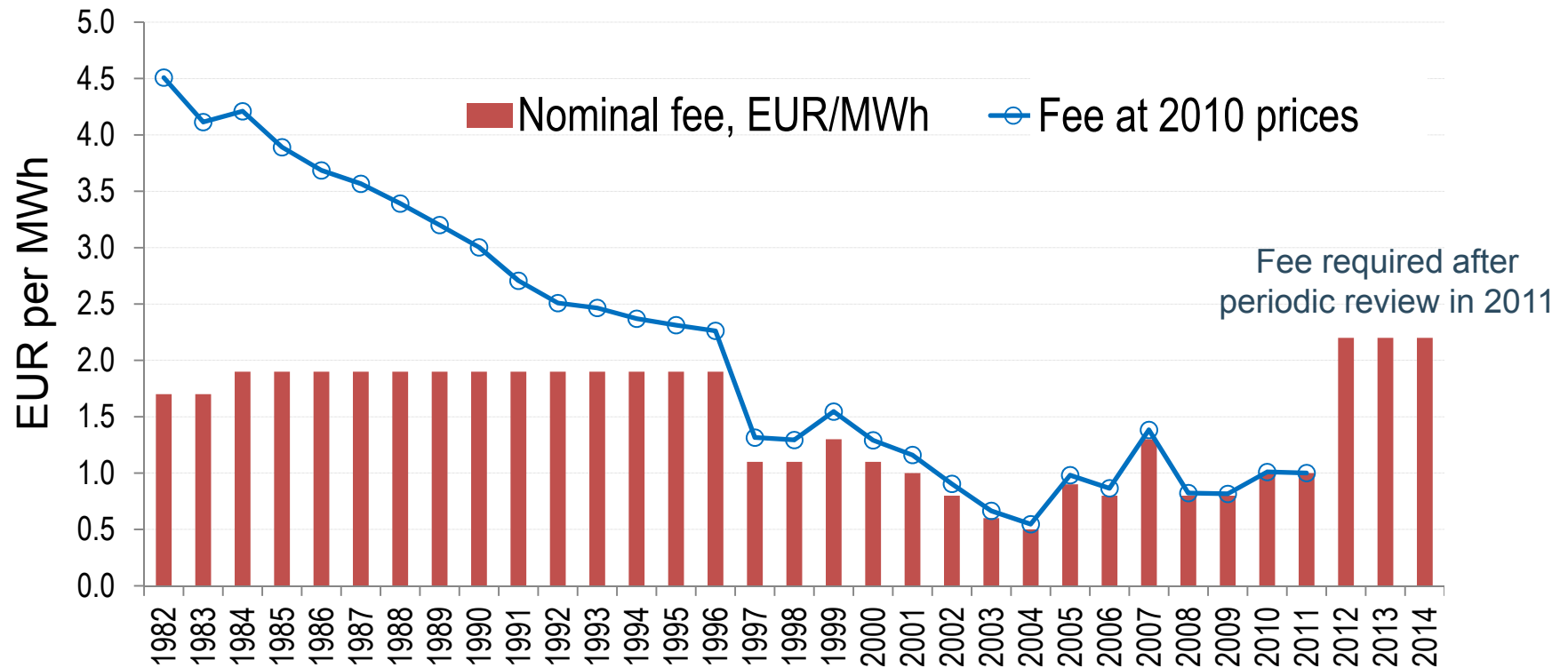
Requirements and features of RWM financing (3/3)

- In some countries a **dedicated fund** is established that is often administered by a third party; this approach promotes transparency, insolvency protection and confidence.
- **Periodic reassessments** of liability estimates and of funds are important to ensure sufficiency and adequacy.
- To guarantee availability, **ring-fencing** of funds is a key feature. Other protective measures are sometimes implemented.

OECD/NEA, *Radioactive Waste in Perspective*, 2010.

OECD/NEA, *Economics of the Back-end of the Nuclear Fuel Cycle*, 2013.

Practice: Evolution of fee in Sweden



Initial values covered substantial levels of uncertainties, which could be gradually reduced as more accurate knowledge of costs had been gained through further advancements of the programme.

Source: OECD/NEA, *Economics of the Back-end of the Nuclear Fuel Cycle*, 2013.

Conclusions

- Expenses for disposal of commercial high-level waste appear over extended periods.
- Funding for the SNF management is often accumulated in funds through fees/levies on nuclear-generated electricity.
- To ensure availability and sufficiency, ring-fencing and frequent periodic reassessments of funds, combined with other protective measures, are essential.
- The deployment of a deep geological repository for high-level waste will reduce uncertainties and raise public confidence.