

Funding Canada's plan for the safe, long-term management of used nuclear fuel

Canada has a plan for its used nuclear fuel. It is called Adaptive Phased Management (APM), and the Nuclear Waste Management Organization (NWMO) leads its implementation.

The plan emerged from a three-year dialogue with the public and calls for a deep geological repository to safely manage used nuclear fuel over the very long term. Following a community-driven site selection process, in late 2024, the NWMO selected Wabigoon Lake Ojibway Nation and the Township of Ignace as the host communities for the repository, subject to successfully completing the required regulatory decision-making process.

Canada's nuclear fuel waste owners fund the plan for this repository, including the full lifecycle of its operations, and the NWMO itself.



Waste owners pay for Canada's plan for used nuclear fuel

The development and implementation of Canada's long-term plan for used nuclear fuel is funded by the waste owners in Canada: Ontario Power Generation, New Brunswick Power, Hydro-Québec and Atomic Energy of Canada Limited.

The *Nuclear Fuel Waste Act* (NFWA) requires each of these four companies to establish independently managed trust funds and make annual deposits to ensure the money to fund this project will be available when needed. Effectively, this means the consumers who benefit from the electricity will, over time, fund the long-term management of the waste that is generated.

Paying for the long-term management of used nuclear fuel is a relatively small portion of the cost of electricity — only a fraction of a cent per kilowatt hour of electricity produced.

Each waste owner pays a fair share of the costs

The Minister of Natural Resources (now the Minister of Energy and Natural Resources) approved the funding formula in April 2009, and the NWMO is responsible for maintaining it.

Each waste owner's deposit is calculated based on the number of fuel bundles it has produced and continues to create. The amounts cover estimated fixed costs for the NWMO to construct, operate, monitor and decommission a deep geological repository, as well as variable costs associated with managing each fuel bundle.

Waste owners make annual contributions to trust funds

In 2026, the four waste owners are required to make a total trust fund deposit of \$122 million.

This deposit represents the 2026 contribution towards the cost of the long-term management of the 3.4 million fuel bundles produced up to June 2025, as specified in the APM funding formula.

In addition to these trust fund contributions, waste owners are also responsible for funding the NWMO's annual operating budget.

Waste owners are also required under the *Nuclear Safety and Control Act* (NSCA) to provide to the Canadian Nuclear Safety Commission financial guarantees that are dedicated to nuclear waste management and decommissioning.

Funding is in place for the entire lifecycle of Canada's plan for used nuclear fuel

One of the NWMO's important responsibilities is determining the lifecycle cost of the project so we can ensure the funds will be available when needed.

The lifecycle cost estimate explains what we anticipate the project will cost from beginning (when the siting process began in 2010) to end (when the repository is decommissioned) and why. It includes costs to design, develop, construct, operate, monitor and decommission a long-term facility, including the deep geological repository and Centre of Expertise, and to transport the used nuclear fuel to the repository.

The NWMO completed a full update of the cost estimate for the used nuclear fuel repository project in 2021, and the next update is in development. Based on the 2021 cost estimate, the estimated cost for construction of the facility was approximately \$4.5 billion (in 2020 dollars), and the funding required for the entire lifecycle from 2026 onwards would be \$12 billion (using 2026 present value).

We make several assumptions for planning purposes to ensure sufficient funds are available, including an estimate of used fuel bundle volume that we update each year. The 2021 cost estimate was based on an expected volume of approximately 5.5 million used fuel bundles, the projected inventory at the time for what Canada's existing nuclear reactors would create through to the end of their operating lives.

The next cost estimate will increase, as it is influenced by real-world changes since the last update, including post-pandemic inflation and economic shifts, evolving fuel volumes (which influence expected duration of operations), and refined assumptions based on our progress in selecting a site for the repository and advancing the design.

The funds in place today will grow correspondingly to cover the full cost of the project over the long term, based on continued additional payments from the funders of the project and through expected investment income that will also grow over time.

Nuclear Fuel Waste Act funding requirements

Funding for Canada's plan must look decades ahead and base future costs on today's dollar value. The NWMO's cost estimates ensure waste owners will fund the entire cost of planning and building the repository, as well as the costs of getting the used fuel to the facility and operating it for decades to come.

The \$12-billion funding requirement includes ongoing work to complete the detailed design, develop the Centre of Expertise, evaluate environmental impacts, and obtain the site preparation licence and the construction licence under the NSCA. These pre-construction costs are paid for by the waste owners based on the annual budget as approved by the NWMO's Board of Directors.



The NWMO is responsible for determining the cost of the project and designing a system that collects the funds needed.

The remaining funding included in the estimate will allow the NWMO to complete construction, transport the used fuel to the repository, and operate, close and monitor the facility. The NFWA requires that these post-construction costs be funded by waste owner contributions to the NFWA Trust Funds.

Waste owners make regular contributions to trust funds to meet the project implementation costs and ensure funds necessary for constructing the facility will be available by the time construction begins.

Trust fund balances at the end of 2025 were \$6 billion. Waste owners continue to contribute annually as the used fuel inventory increases, to ensure that the full funding requirement for existing and future inventory of used fuel bundles is fulfilled.

Planning for new market entrants and emerging technologies

The NFWA also considers the potential for new market entrants, and the government-approved formula used to determine funding for APM anticipated this eventuality. For new nuclear projects, the NWMO would provide a fee for service at fair and reasonable costs and determine the long-term management requirements and associated costs for the resulting fuel wastes.

Thinking about the future is part of the NWMO's DNA. Even though this new used fuel will not be ready to be placed in a repository for decades, we are already thinking about ways to be flexible and keep options open.

We are monitoring closely, and in dialogue with multiple new nuclear project proponents, to help us prepare for decisions that could change the volume and type of waste we are responsible for managing. And in case we need additional capacity to accommodate used fuel from reactors that are not yet built or operating, we are exploring the potential to include used fuel in a second repository project we are undertaking to store intermediate- and high-level radioactive waste.

Planning for this second repository is still in the early stages of development. In 2026 and 2027, we are seeking input on a proposed site selection process. The site selection process is expected to begin in 2028.

Canada's plan looks a century into the future and beyond

In late 2024, the NWMO selected Wabigoon Lake Ojibway Nation and the Township of Ignace as the host communities for the future site for Canada's deep geological repository for used nuclear fuel, subject to successfully completing the required regulatory decision-making process. Further site characterization and licensing activities could take about nine years. Construction is expected to take about 10 years. In this scenario, we assume that operations could begin between 2040 and 2045.

Operations are expected to last for about 50 years, depending on the volume of used fuel to be managed. After that, the repository will be monitored for an extended period of time — we have assumed 70 years for planning purposes.

The NWMO provides regular updates on the progress of Canada's plan

The NWMO produces annual reports on our progress, which are made public. We also maintain a social media presence on Facebook, Instagram, X and LinkedIn that provides up-to-date information. Our website (nwmocanada.ca) includes news stories about ongoing activities, technical and social engagement reports, and an archive for those interested in learning more about Canada's plan for used nuclear fuel.

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