

## The problem with New Brunswick's plans for high-level nuclear waste

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In March 2021, the federal department of Innovation, Science and Economic Development (ISED) and the Atlantic Canada Opportunities Agency (ACOA) gave a \$50.5 million grant to a start-up company, Moltex Energy, based in Saint John. Moltex is planning to develop a nuclear project in New Brunswick that experts say will undermine Canada's credibility as a non-proliferation partner.

Moltex wants to extract plutonium from the thousands of used nuclear fuel bundles currently stored as "high-level radioactive waste" at the Point Lepreau reactor site on the Bay of Fundy. The idea is to use the plutonium as fuel for a new nuclear reactor, still in the design stage. If the project is successful, the entire package could be replicated and sold to other countries if the Government of Canada approves the sale.

On May 25, nine US non-proliferation experts sent an [open letter](#) to Prime Minister Justin Trudeau expressing concern that by "backing spent-fuel reprocessing and plutonium extraction, the Government of Canada will undermine the global nuclear weapons non-proliferation regime that Canada has done so much to strengthen."

The nine signatories to the letter include senior White House appointees and other US government advisers who worked under six US presidents: John F. Kennedy, Lyndon B. Johnson, Richard Nixon, George H.W. Bush, Bill Clinton, and Barack Obama; and who hold professorships at the Harvard Kennedy School, University of Maryland, Georgetown University, University of Texas at Austin, George Washington University, and Princeton University.

Plutonium is a human-made element created as a byproduct in every nuclear reactor. It's a "Jekyll and Hyde" kind of material: on the one hand, it is the stuff that nuclear weapons are made from. On the other hand, it can be used as a nuclear fuel. The crucial question is, can you have one without the other?

India exploded its first nuclear weapon in 1974 using plutonium extracted from a “peaceful” Canadian nuclear reactor given as a gift many years earlier. In the months afterwards, it was discovered that South Korea, Pakistan, Taiwan, and Argentina—all of them customers of Canadian nuclear technology—were well on the way to replicating India’s achievement. Swift action by the US and its allies prevented these countries from acquiring the necessary plutonium extraction facilities (called “reprocessing plants”). To this day, South Korea is not allowed to extract plutonium from used nuclear fuel on its own territory—a long-lasting political legacy of the 1974 Indian explosion and its aftermath—due to proliferation concerns.

Several years after the Indian explosion, the US Carter administration ended federal support for civil reprocessing of spent nuclear fuel in the US out of concern that it would contribute to the proliferation of nuclear weapons by making plutonium more available. At that time, Canada’s policy on reprocessing also changed to accord with the US policy—although no similar high-level announcement was made by the Canadian government.

Moltex is proposing to use a type of plutonium extraction technology called “pyroprocessing,” in which the solid used reactor fuel is converted to a liquid form, dissolved in a very hot bath of molten salt. What happens next is described by Moltex chairman and chief scientist Ian Scott in a recent article in *Energy Intelligence*. “We then—in a very, very simple process—extract the plutonium selectively from that molten metal. It’s literally a pot. You put the metal in, put salt in the top, mix them up, and the plutonium moves into the salt, and the salt’s our fuel. That’s it. ... You tip the crucible and out pours the fuel for our reactor.”

Proponents are calling the Moltex project “recycling” nuclear waste, although in fact barely one-half of one per cent of the used nuclear fuel is potentially available for use as new reactor fuel. That leaves a lot of radioactive waste left over.

From an international perspective, the government grant to Moltex can be seen as Canada sending a signal—giving a green light to plutonium extraction and the reprocessing of used nuclear fuel.

The US experts’ primary concern is that other countries could point to Canada’s support of the Moltex program to help justify its own plutonium acquisition programs. That could undo years of efforts to keep nuclear weapons out of the hands of countries that might want to join the ranks of unofficial nuclear weapons states such as Israel, India, Pakistan, and North Korea. The Moltex project is especially irksome since its proposed pyroprocessing technology is very similar to the one that South Korea has been trying to deploy for almost 10 years.

In their letter, the American experts point out that Japan is currently the only nonnuclear-armed state that reprocesses spent nuclear fuel, a fact that is provoking both domestic and international controversy.

In a follow-up exchange, signatory Frank von Hippel of Princeton University explained that the international controversy is threefold: (1) The United States sees both a nuclear weapons

proliferation danger from Japan's plutonium stockpile and also a nuclear terrorism threat from the possible theft of separated plutonium; (2) China and South Korea see Japan's plutonium stocks as a basis for a rapid nuclear weaponization; and (3) South Korea's nuclear-energy R&D community is demanding that the US grant them the same right to separate plutonium as Japan enjoys.

Despite the alarm raised by the nine authors in their letter to Trudeau, they have received no reply from the government. The only response has come from the Moltex CEO Rory O'Sullivan. His reply to a *Globe and Mail* reporter is similar to his earlier rebuttal in *The Hill Time* published in his [letter to the editor](#) on April 5: the plutonium extracted in the Moltex facility would be "completely unsuitable for use in weapons."

But the International Atomic Energy Agency (IAEA) [has stated](#) that "Nuclear weapons can be fabricated using plutonium containing virtually any combination of plutonium isotopes." All plutonium is of equal "sensitivity" for purposes of IAEA safeguards in nonnuclear weapon states.

Similarly, a 2009 [report](#) by nonproliferation experts from six US national laboratories concluded that pyroprocessing is about as susceptible to misuse for nuclear weapons as the original reprocessing technology used by the military, called PUREX.

In 2011, a US State Department official responsible for US nuclear cooperation agreements with other countries went further by [stating](#) that pyroprocessing is just as dangerous from a proliferation point of view as any other kind of plutonium extraction technology, saying: "frankly and positively that pyro-processing is reprocessing. Period. Full stop."

And, despite years of effort, the IAEA has [not yet developed](#) an approach to effectively safeguard pyroprocessing to prevent diversion of plutonium for illicit uses.

Given that history has shown the dangers of promoting the greater availability of plutonium, why is the federal government supporting pyroprocessing?

It is clear the nuclear lobby wants it. In the industry's [report](#), "Feasibility of Small Modular Reactor Development and Deployment in Canada," released in March, the reprocessing (which they call "recycling") of spent nuclear fuel is presented as a key element of the industry's future plans.

Important national and international issues are at stake, and conscientious Canadians should sit up and take notice. Parliamentarians of all parties owe it to their constituents to demand more accountability. To date however, there has been no democratic open debate or public consultation over the path Canada is charting with nuclear energy.

**Conclusion: The new draft radioactive waste management policy developed by Natural Resources Canada allows for reprocessing high-level waste. This change moves our national policy in a dangerous direction. Reprocessing must be banned in Canada.**

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