

Plutonium and reprocessing

The nuclear industry refers to extracting plutonium or other specific isotopes from nuclear fuel waste as “reprocessing” or “recycling.” It is highly contaminating, practiced in only a few countries, and linked to nuclear proliferation and nuclear weapons.

There has never been commercial reprocessing in Canada. The limited reprocessing done at the federal government's Chalk River Nuclear Laboratory has left a legacy of nuclear contamination. Canada is currently reviewing its radioactive waste policy. The revised policy must include a formal prohibition on nuclear fuel waste reprocessing in Canada.

Plutonium

Uranium is the only naturally occurring material that can be used to fuel a nuclear reactor. Plutonium is a uranium derivative that can also be used to fuel a reactor or make an atomic bomb.

Plutonium is not naturally occurring; it is created as a by-product in uranium-fueled nuclear reactors. Once created, stored plutonium is indestructible and lasts for hundreds of thousands of years.

Plutonium is extremely toxic, but relatively easy to hide and can be smuggled across borders.

Unlike uranium, plutonium needs no enrichment, because all plutonium is chain-reacting in bombs.

The first nuclear reactors, including Canada's first, were used to produce plutonium for bombs. From 1947 to 1965 Canada sold plutonium produced at Chalk River to the US for weapons use.

In 1974 India exploded its first atomic bomb using plutonium from a Canadian reactor given as a gift.

Reprocessing

Reprocessing is used to obtain plutonium for nuclear weapons of all kinds including H-Bombs. For weapons use, plutonium has to be extracted from the extremely radioactive used nuclear fuel.

Any technology to separate plutonium from radioactive wastes in used fuel is called “reprocessing”.

Since plutonium can be used to fuel a reactor, there is a non-military interest in reprocessing also. However, reprocessing is hugely expensive and so there is no non-military market for it. Currently approximately [545 tonnes of plutonium](#) are stored, mostly in Europe and Russia, in heavily guarded facilities, which itself is a huge expense.

Aside from being very expensive, reprocessing produces largely intractable forms of liquid radioactive wastes that in some cases have proven to be difficult and very expensive to manage.

Plutonium that has been obtained for civilian use can always be diverted to make nuclear weapons. Any regime, thousands of years from now, can use the plutonium in nuclear fuel waste for bombs.

A recent report published by the International Panel on Fissile Materials called for a global ban on separating plutonium.

The Canadian government is pushing in the opposite direction, increasing its research capacity to separate plutonium, and funding a company that seeks to export SMRs fueled by this material.

**REPROCESSING=
PLUTONIUM=
NUCLEAR WEAPONS**