

# Nuclear energy – Health, safety and the environment

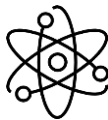
Alberta, like many jurisdictions in Canada and around the world, is exploring the potential of nuclear energy development. Able to provide abundant, emissions-free energy 24 hours a day, nuclear power could help meet Alberta's future energy needs as our population grows and the demand for electricity rises.

Canada has been safely operating nuclear power plants for more than 60 years. The industry is strictly regulated, with strong protections in place to safeguard the health and safety of both workers and the public, as well as the environment.

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## Health

Nuclear energy produces radiation. Because of the known health risks, exposure to radiation is carefully controlled in Canada in each of its applications, from medicine to air travel to operating a nuclear power plant.



- Radiation is energy that moves from one place to another in particles or waves. It is all around us.
- We are exposed to naturally occurring radiation which comes from many places including soil, rocks, water and even many common foods.



- The amount of radiation occurring naturally in the environment has no measurable health effects.
- Nuclear power plants release very low amounts of radiation during normal operation – less than 0.1% of what occurs naturally in our environment.

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## Environment

Nuclear power is a sustainable option for generating electricity. It produces no direct greenhouse gas emissions and uses less land than other sources.

### Waste management

One of the challenges of using nuclear energy is that it produces radioactive waste, which must be carefully managed and stored long-term to protect people and the environment. A typical 1,000 megawatt (MW) nuclear power plant produces about a single car garage worth of radioactive waste per year. Radioactive waste is often stored for at least 50 years before disposal.

#### Wet storage

Fuel bundles are stored in water-filled pools to cool and reduce radioactivity

#### Dry storage

After 6-10 years, used fuel bundles are stored in large concrete containers.

#### Disposal

Waste will be contained in a deep geological repository, 650-800 metres underground.

Storage is regulated by the Canadian Nuclear Safety Commission (CNSC) in cooperation with the International Atomic Energy Agency and is managed by the utilities and laboratories that own the fuel. Canada's Nuclear Waste Management Organization is developing a long-term strategy to safely contain and store nuclear waste in a deep geological repository.

## Protecting water

Ensuring the safety of our rivers, lakes and groundwater is critically important to the environment and human health. In Canada, rigorous protections are in place to safeguard this valuable resource. The CNSC regulates and monitors nuclear facilities both during normal operation and in the event of an accident.

- Controlling liquid waste
- Groundwater monitoring
- Regular inspections
- Containment systems

## Safety

Canada has operated nuclear power plants for more than 60 years with a strong safety record and has rigorous emergency preparedness protocols in place to protect people and the environment in the unlikely event of an emergency at a nuclear power facility. The CNSC regulates all facilities and ensures their safe operation. The facility operator and provincial authorities also have specific responsibilities in an emergency.

<b>Power plant operator</b>	<ul style="list-style-type: none"><li>• Stops or mitigates the progression of the nuclear emergency</li><li>• Minimizes impact to surrounding communities</li><li>• Provides clear, updated information and technical support to authorities</li></ul>
<b>Canadian Nuclear Safety Commission</b>	<ul style="list-style-type: none"><li>• Oversees operator's response to the event</li><li>• Ensures appropriate response actions are taken</li><li>• Provides technical advice to federal and provincial authorities</li><li>• Informs government and the public of its assessment of the emergency</li></ul>
<b>Provincial authorities</b>	<ul style="list-style-type: none"><li>• Initiates public alert systems</li><li>• Decides and communicates protective measures for the public</li><li>• Monitors radiation levels outside the facility</li><li>• Establishes evacuation centres</li></ul>

## Learn more

<b>Canadian Nuclear Safety Commission</b> <a href="http://www.cnsccsn.gc.ca">www.cnsccsn.gc.ca</a>	<ul style="list-style-type: none"><li>• Regulates the use of nuclear energy and materials in Canada to protect health, safety, security and the environment.</li></ul>
<b>International Commission on Radiological Protection</b> <a href="http://www.icrp.org/">www.icrp.org/</a>	<ul style="list-style-type: none"><li>• Independent international organization with the mission to protect people, animals and the environment from the harmful effects of radiation.</li><li>• CNSC follows their recommendations on radiation dose limits for nuclear workers and the public.</li></ul>
<b>Nuclear Waste Management Organization</b> <a href="http://www.nwmo.ca">www.nwmo.ca</a>	<ul style="list-style-type: none"><li>• Organization tasked with the safe, long-term management of Canada's used nuclear fuel, in a manner that protects people and the environment.</li></ul>
<b>International Atomic Energy Agency</b> <a href="http://www.iaea.org">www.iaea.org</a>	<ul style="list-style-type: none"><li>• United Nations agency for cooperation in the nuclear field. Works with member states and worldwide partners to promote the safe, secure and peaceful use of nuclear technologies.</li></ul>