THE POTENTIAL TO POWER A NET ZERO FUTURE

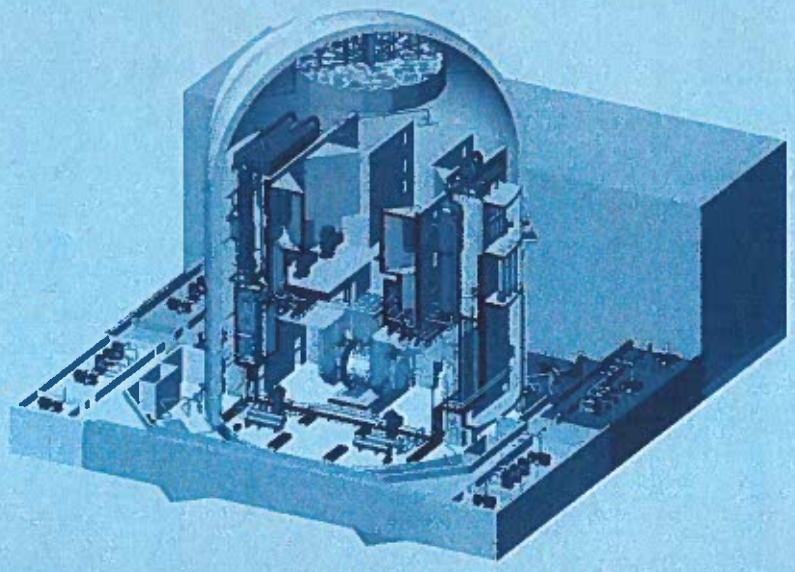
CANDU technology powered Ontario's complete phase-out of coal-based fuel in 2014. However, our energy needs continue to grow: they're projected to soon be double our current generation capacity, and beyond our borders, the rest of the world needs a great deal of carbon-free power, fast!

Not only can the CANDU MONARK 1,000 MWe class Gen III+ reactor meet these needs, it also supports other clean energy generators, including intermittent renewables and emerging technologies.

Our most advanced technology yet is also more commercially economical when deployed at scale.

CANDU MONARK FEATURES

- Improved cost per megawatt-hour
- Longer operating life
- Sustainable design that minimizes its environmental impact
- Easier maintenance that includes enhanced online and predictive features
- Ease of integration with flexible electricity grids
- Compatibility with isotope production



Contact **Lillian Tarnawsky**
at **lillian.tarnawsky@atkinsrealis.ca**
to learn how CANDU MONARK is taking flight.

AtkinsRéalis

THE NEXT EVOLUTION OF CANDU IS TAKING FLIGHT

AN ATKINSRÉALIS SOLUTION

AtkinsRéalis is committed to decarbonizing the planet. Clean, low-carbon nuclear power is a key solution for reaching our global net zero goal.

CANDU MONARK REACTORS: THE FUTURE OF CLEAN ENERGY

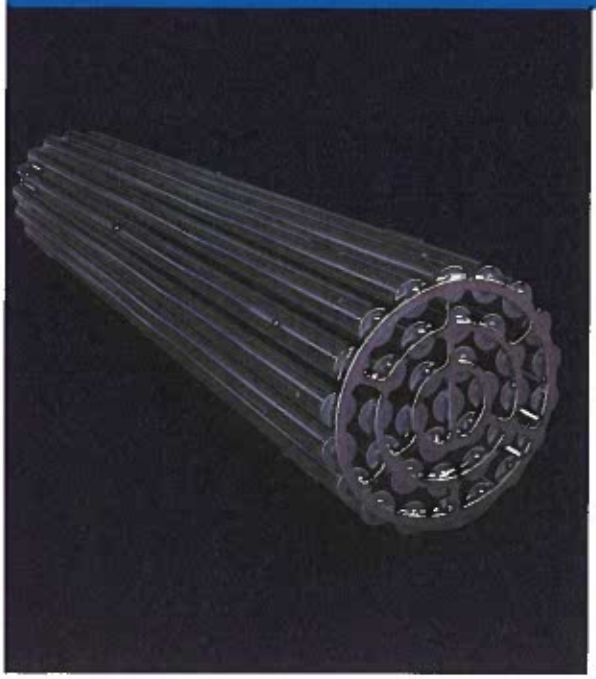
CANDU® MONARK™ reactors leverage and improve on the best of our world-renowned CANDU nuclear technology. Decades of design and technological innovation make this our most advanced technology yet, and everyone stands to benefit.

Monark

Candu

ENERGY Alberta

Waste Management



Commitment to Safety: Understanding Nuclear Waste Management

Canada has been a global leader in nuclear energy research, technology and development for 65 years. Nuclear energy is one of Canada's safest and cleanest energy sources and is recognized globally as a critical tool in reducing greenhouse gases and fighting climate change.

In Canada, the Canadian Nuclear Safety Commission rigorously oversees every stage of nuclear waste management, from handling and transport to storage and final disposal.

Power Points: What You Need to Know About Used Nuclear Fuel

Radioactivity decreases over time.

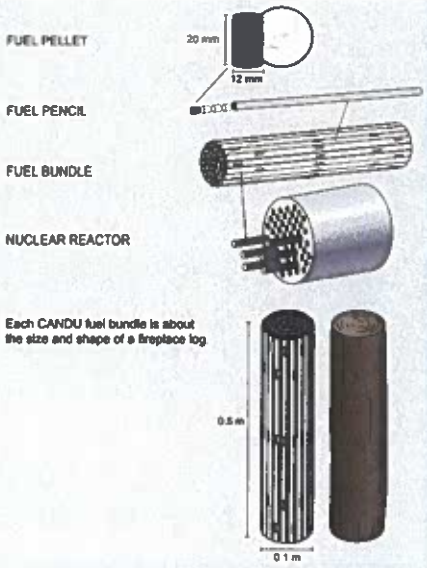
With modern containment strategies, risks are minimized while technology continues to improve long-term storage solutions.

Properly managed waste does not pose immediate threats.

Safety protocols and containment measures are strictly followed to protect people and the environment.

Tailored solutions.

Each type of waste requires specific management techniques, ensuring tailored solutions that align with its unique characteristics.



Source: Nuclear Waste Management Organization.

What is Used Nuclear Fuel?

Used nuclear fuel is a byproduct of nuclear power and it must be safely managed long-term. Although its radioactivity level decreases rapidly with time, the used fuel must be contained and isolated from people and the environment, essentially indefinitely.

Canada follows proven practices used globally and used fuel is first stored on-site in pools, then in dry storage using concrete cannisters before being sent to long-term disposal.

Once a used nuclear fuel bundle is removed from a reactor, it is placed in a water-filled pool where its heat and radioactivity decrease over time. After seven to 10 years, the bundle is placed in a dry storage container, a method that has been in use worldwide since the 1980s.

A Safe Approach to Managing Waste

Energy Alberta is committed to the safe disposal of nuclear waste using proven technology to mitigate any potential risks associated with the management and storage of nuclear waste. Our facility would adhere to the robust regulations and best practices set by the Canadian Nuclear Safety Commission and international regulators to ensure all forms of conventional and nuclear waste are handled in a safe, secure and responsible manner.

Canada's Long-Term Plan

Safe, long-term management of used nuclear fuel.

The Nuclear Waste Management Organization (NWMO) is the not-for-profit organization tasked with the safe, long-term management of Canada's used nuclear fuel in a manner that protects people and the environment for generations to come. The technical method will involve building a deep geological repository in a suitable rock formation to safely contain and isolate used nuclear fuel using a multiple-barrier system. NWMO selected Wabigoon Lake Ojibway Nation and the Township of Ignace in Ontario as the host communities for the future repository site. Learn more at nwmo.ca.

Source: Nuclear Waste Management Organization.

Types of Nuclear Waste

65 years of safe operations

Canada's nuclear industry is one of the most regulated in the world and its facilities are the most protected critical infrastructure in Canada. All nuclear waste is safely managed in compliance with stringent regulations and in accordance with international standards.

Low-Level Waste.

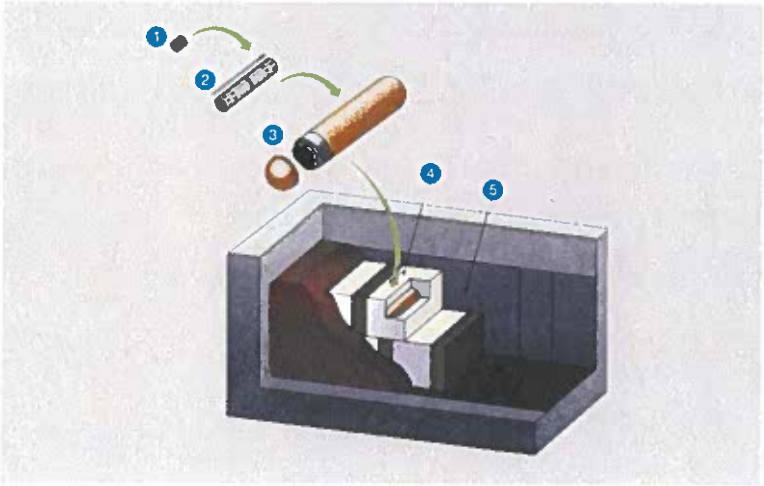
These materials can be handled with minimal protective measures and include items such as used protective clothing, tools and lab waste.

Intermediate-Level Waste.

These materials require shielding during handling and include items such as reactor components, resins from water treatment and certain chemicals.

High-Level Waste.

These materials require robust containment, cooling measures and long-term management and include items such as spent nuclear fuel and reactor components, such as control rods and piping.



The Peace River Nuclear Power Project

Utilizing Canada's proven nuclear technology.

Energy Alberta is an Alberta-based company led by an experienced group of innovators, nuclear industry experts and leaders in environmental sustainability. We are proposing to build a world-class nuclear power generating station in the Peace River area of Northern Alberta that would include two to four 1,000MW-class CANDU® MONARK™ reactors. The facility could produce up to 4800MW of electricity to the grid, representing up to 30% of the province's existing electricity generation.

ENERGY Alberta

Peace River Nuclear Power Project

Powering Alberta's Clean Energy Future

Alberta has the opportunity to lead in clean energy innovation.

Nuclear energy offers a zero-emission source of electricity, ensuring a reliable supply and stable pricing. By leveraging this technology, we can create a made-in-Alberta solution to secure long-term energy stability while advancing both our environmental and economic objectives.

Project Overview

Utilizing Canada's proven nuclear technology.

Energy Alberta is proposing to build a nuclear power generating station in the Peace River area of Northern Alberta that would include two to four 1,000MW CANDU® MONARK™ reactors. The facility could produce up to 4800MW of electricity to the grid, representing up to 30% of the province's existing electricity generation.

Project Status

Phase 1: Bringing Expertise Together

Energy Alberta has assembled a team with extensive nuclear experience and initiated the planning required to advance a nuclear generation project in Canada, including early consultations with government, community leaders and Indigenous groups.

Phase 2: Impact Assessment Process

Energy Alberta plans to submit an Initial Project Description in 2025 that will initiate a federal Impact Assessment (IA) for the Peace River Nuclear Power Project.

The IA process is led by the Impact Assessment Agency of Canada (IAAC) and the Canadian Nuclear Safety Commission (CNSC), and will evaluate the potential effects of the project on the environment, health, society and economy. It will also assess the impact on Indigenous peoples and their rights.

Phase 3: Decision on Public Interest

An IA is a phased planning process spanning over multiple years, involving extensive community and public engagement, as well as comprehensive environmental and socioeconomic studies. Upon completion of the IA process, the federal government determines whether the project is in the public interest and grants approval for it to proceed.

The Advantages of Nuclear

Harnessing the power of innovation.

Canada's nuclear industry is an economic engine, offering high-paying jobs to skilled workers, and significant revenue for provincial and federal governments.

Jobs

89,000 people employed.

Revenue

$22 billion in annual GDP contribution.

Output

15% of Canada's electricity.

Environmental Advantage

80 million tonnes of CO_2 emissions per year are avoided.

Energy Security

Nuclear Energy runs 24/7, 365 days a year.

Supply

Canada is the second largest uranium producer in the world.

CANDU: A Canadian Success Story

65 years of safe operations.

Canada's nuclear industry is one of the most regulated in the world and its facilities are the most protected critical infrastructure in Canada.

Operating Excellence

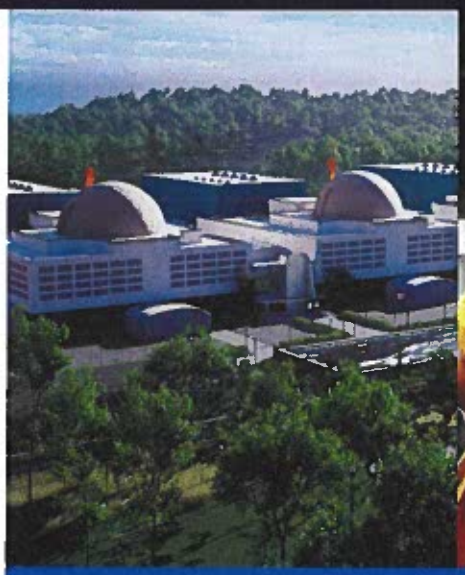
CANDU® reactors have amassed more than 900 years of safe operating experience in seven countries around the world.

Canadian Success

There are 19 operating CANDU® reactors in Canada - 18 in Ontario and one in New Brunswick.

Global Presence

Canada has exported CANDU® technology around the world with 30 reactors in operation globally. As well, India operates 16 reactors that are based on the CANDU® design.



Energy Alberta

Greening the power supply.

Energy Alberta an Alberta-based company led by an experienced group of innovators, nuclear industry experts and leaders in environmental sustainability. We are dedicated to building and operating a world-class nuclear electricity generating station that will transform energy production in the province. Founded in 2005, our vision is to diversify Alberta's energy portfolio by providing safe, secure energy for Albertans while creating high-quality jobs and economic opportunities.

Radiation Safety

Canada has been producing nuclear energy since the early 1960s. Nuclear power plants in Canada are subject to strict health and safety regulations and are routinely inspected to ensure they meet or exceed rigorous safety and environmental standards established by the Canadian Nuclear Safety Commission and international organizations.

Protecting People and the Environment

Canada's nuclear industry is subject to some of the strictest radiation safety standards in the world. The Canadian Nuclear Safety Commission regulates the life cycle of nuclear plants and has a team of technical experts and onsite inspectors to maintain rigorous oversight of plant operation. Nuclear power plants adhere to rigid radiation protection regulations under the Nuclear Safety Control Act, as well as recommendations from international organizations such as the International Atomic Energy Agency (IAEA) that provide global safety standards for radiation exposure.

Minimizing radiation releases.

Nuclear power plants have control and safety systems in place to minimize radiation releases. During normal operations, they release very small amounts of radiation into the air and water. These releases come from the reactor and its system and from waste management activities.

In order to reduce airborne releases, highly efficient filters and radiation monitors are installed as part of the ventilation systems. Filters remove more than 99% of the radiation from the air before it is released to the environment.

Used Nuclear Fuel.

After nuclear fuel has been used in a reactor, it is removed and stored securely in a water-filled pool for a period of 7 to 10 years. The water in the pool continues to cool the fuel and provides shielding against radiation. All of Canada's fuel pools are built in ground, in separate buildings at the nuclear power plant, and are designed to withstand earthquakes.

After 7-10 years, the bundles are placed in dry storage containers, silos or vaults. After 50 years, the life of the container could be extended, or the used fuel could be repackaged. The Nuclear Waste Management Organization has announced their selection of the Wabigoon Lake Ojibway Nation-Ignace area in Ontario as the site for Canada's deep geological repository for used nuclear fuel. Learn more at nwmo.ca.

Safety Measures in Canadian Nuclear Plants

Canadian nuclear power plants are equipped with multiple, independent **robust control and safety systems** designed to prevent accidents and mitigate the effects should an accident occur. The systems perform three fundamental safety functions: controlling the reactor, cooling the fuel and containing radiation.

Containment Structures.

These are thick concrete walls designed to isolate the radioactive materials inside the reactor. Even in the unlikely event of an accident, the containment structures are built to prevent radiation from spreading.

Radiation Shielding.

Materials such as water, concrete and lead are used to absorb radiation and protect workers and the surrounding environment.

Monitoring Systems.

Continuous radiation monitoring systems are in place inside and outside the plant. These systems ensure that radiation levels remain within strict safety limits, both for plant workers and the nearby community.

A Safe and Sustainable Future

Nuclear power is one of Canada's safest and cleanest energy sources and offers one of the best ways to meet Alberta's constant and growing electricity demands.

Reliable & Consistent.

Nuclear power plants can operate 24/7, 365 days a year, providing a constant, stable and affordable source of electricity that is readily scalable.

Zero Emissions.

Nuclear energy produces virtually zero greenhouse gas emissions during operation, making it a critical tool in combating climate change.

Energy Security.

In an increasingly volatile global energy market, nuclear power offers a path to energy independence by reducing reliance on imported fossil fuels.

Understanding Radiation

We are exposed to natural and man-made sources of radiation in our daily lives every day. Radiation is energy that travels through space in the form of electromagnetic waves or particles.

Ionizing Radiation.

This type of radiation has enough energy to break an electron away from an atom causing that it to become charged. It is the type produced by nuclear power plants and x-ray machines.

Non-Ionizing Radiation.

This type, such as visible light or radio waves, does not have enough energy to affect atomic structure. It is the type produced by microwaves and Wi-Fi.

Naturally Occurring Radiation.

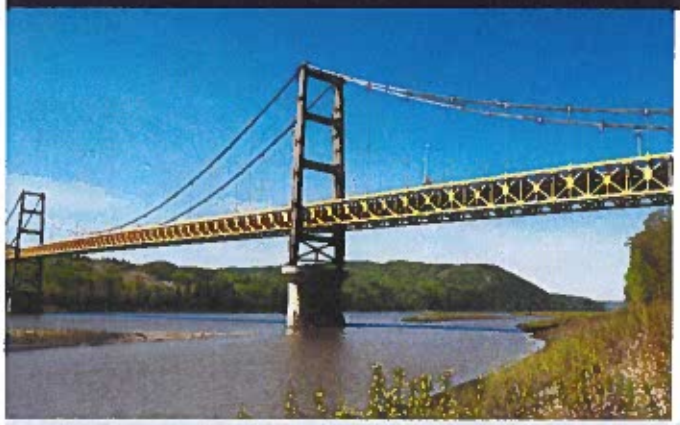
Radioactive elements like potassium-40 and carbon-14 are a part of the world around us. Potassium-40 is present in the foods we eat, like bananas and potatoes. Carbon-14 is found in the atmosphere and makes its way into us through the food chain.

Ionizing radiation is produced during nuclear fission, the process that powers nuclear reactors. The use of nuclear power in clean energy production is tightly regulated and monitored to ensure the highest standards of public and environmental safety.

Workers in a nuclear power plant are exposed to far less radiation than what you'd experience from a single medical X-ray. Stringent safety protocols, advanced shielding and state-of-the-art monitoring ensure that radiation exposure for plant workers remains extremely low – often comparable to the natural background radiation we're all exposed to daily.

ENERGY Alberta

Water Use



Protecting Water Resources

Energy Alberta cares deeply about environmental stewardship and promoting sustainable water management practices to minimize the impact of its proposed operations on local water resources and protect the Peace River watershed.

Energy Alberta's Commitment to Water Management

Energy Alberta is proposing to build a nuclear power generating station on the shoreline of the Peace River, one of the largest rivers in Alberta. The Project would involve withdrawing water from the Peace River to use for cooling and other processes required for safe operations. Advanced technology will be utilized to recycle the cooling water and reduce the amount of water needed.

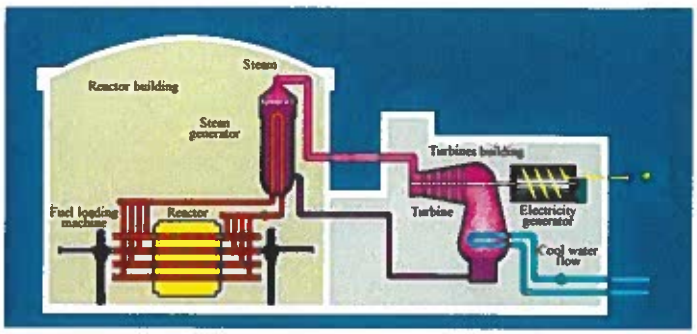
The water management process in nuclear power plants is highly regulated, including permits and mitigation requirements put in place by local, provincial and federal governing bodies to ensure effective conservation and stewardship. Significant efforts are undertaken to protect the habitat of the local watershed, including rigorous environmental programs that monitor, track and analyze surrounding ecosystems to safeguard the health of people and the environment.

Understanding the Water Cooling System

A consistent supply of water from the Peace River, primarily used for cooling, will be an integral part of the Peace River Nuclear Power project. The volume of water required will be determined as technical and project details are refined.

There are three separate circuits that make up the main features of how water is used when generating electricity in a CANDU® nuclear reactor. First, the heat transfer system in a CANDU® nuclear reactor works by circulating heavy water (known as D2O) through the reactor core to transfer the heat generated by the fission process to the steam generator. A separate water circuit is used in the steam generator where the heat from the reactor causes the circulating water to turn into steam. This steam is then transferred to a series of turbines that convert the energy from the steam into electricity.

Once the steam has been used to create electricity, the left over heat must be removed and the steam converted back to water that can be heated up again to produce more electricity. This is done by a third water system called the cooling water circuit. This third water circuit is where the majority of the water needed by the power plant is used. The water in all three of these systems is kept separate and no mixing occurs. The movement of heat energy is across the walls of the pipes that contain the water in each circuit.

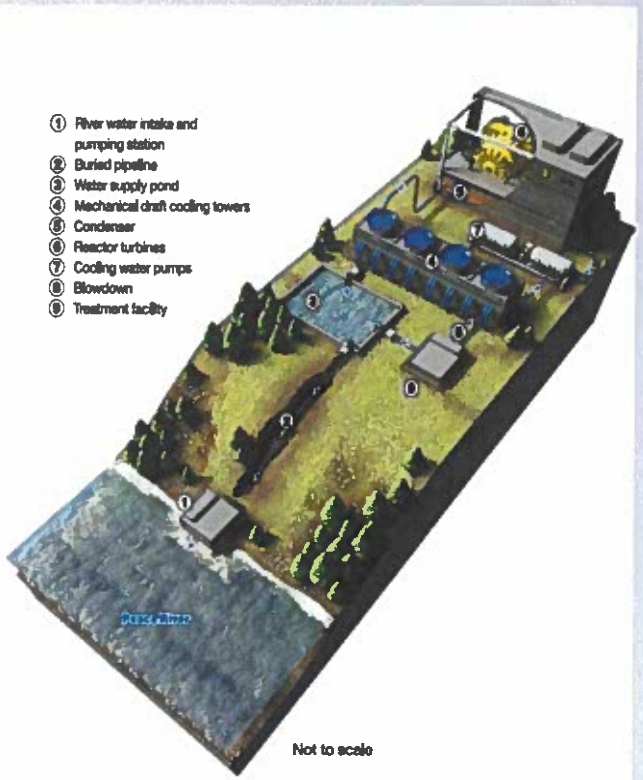


Cooling Water Infrastructure

The proposed project plans to utilize a mechanical draft cooling system to remove the left over heat from the steam circulating through the turbine system after the electricity is generated. This method allows less water to be pumped from the river and prevents heated water being released back into the Peace River. Instead, the water is evaporated, or consumed, in the heat removal process.

Key components of the plant's cooling water infrastructure include:

- Water intake, pipeline and access road to the river.
- Water storage ponds to hold a reserve of water for power production if the amount of water coming from the river is reduced because of ice conditions or low water levels.
- Mechanical draft cooling towers which use fans to move all the air required to transfer heat from the steam driving the turbines to the air. Water is consumed and evaporated as a result of the warm circulating water interacting with relatively dry and cool air.



A Safe and Sustainable Future

Nuclear power is one of Canada's safest and cleanest energy sources and offers one of the best ways to meet Alberta's constant and growing electricity demands.

Reliable & Consistent.

Nuclear power plants can operate 24/7, 365 days a year, providing a constant, stable and affordable source of electricity that is readily scalable.

Zero Emissions.

Nuclear energy produces virtually zero greenhouse gas emissions during operation, making it a critical tool in combating climate change.

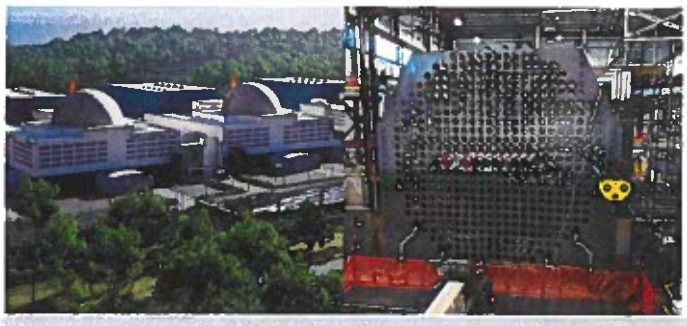
Energy Security.

In an increasingly volatile global energy market, nuclear power offers a path to energy independence by reducing reliance on imported fossil fuels.

The Peace River Nuclear Power Project

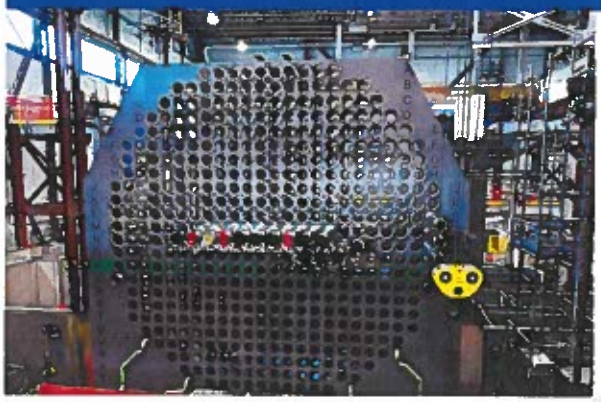
Utilizing Canada's proven nuclear technology.

Energy Alberta is an Alberta-based company led by an experienced group of innovators, nuclear industry experts and leaders in environmental sustainability. We are proposing to build a world-class nuclear power generating station in the Peace River area of Northern Alberta that would include two to four 1,000MW-class CANDU® MONARK™ reactors. The facility could produce up to 4800MW of electricity to the grid, representing up to 30% of the province's existing electricity generation.



ENERGY Alberta

Nuclear Energy



Nuclear Energy: A Clean and Reliable Power Source

Energy Alberta is proposing to build a nuclear power generating station in the Peace River area of Northern Alberta that would include two to four 1,000MW CANDU® MONARK™ reactors. The facility could produce up to 4,800MW of electricity to the grid, representing up to 30% of the province's existing electricity generation.

The Advantages of Nuclear

Greening the Power Supply.
Nuclear power is the only readily scalable, zero-emission energy source capable of delivering reliable and affordable electricity around the clock.

Efficient Footprint.
Unlike some renewable energy sources that require large land areas (like wind farms or solar fields), nuclear power plants have a small **physical footprint** for the energy they produce.

Economic Growth and Job Creation.
Canada's nuclear industry is an economic engine, offering high-paying jobs to skilled workers, and significant revenue for provincial and federal governments.

Abundant Supply.
Canada is one of the largest producers of uranium in the world, the fuel used in the production of nuclear energy.

Power Points: Key Facts about Nuclear Energy

Reliable & Consistent.
Nuclear power plants can operate 24/7, 365 days a year, providing a constant and stable source of electricity. It helps ensure that there is always electricity available, even when the sun isn't shining or the wind isn't blowing.

Zero Emissions.
Nuclear energy produces **virtually zero greenhouse gas emissions** during operation, making it one of the cleanest sources of energy. It plays a critical role in reducing carbon footprints and combating climate change.

High Energy Density.
A small amount of nuclear fuel can generate a tremendous amount of energy. For example, a single uranium fuel pellet is about the size of a sugar cube and can produce the same energy as 907 kg of coal, 564 litres of oil, or 480 cubic metres of natural gas.

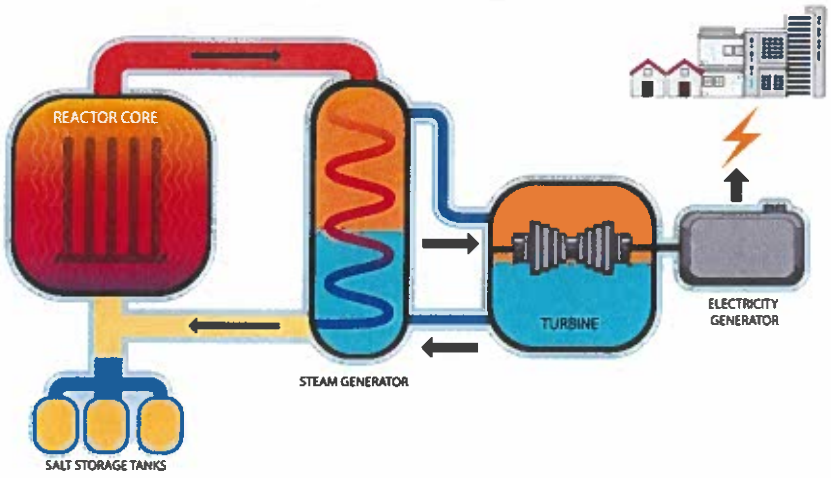
Energy Security.
In an increasingly volatile global energy market, nuclear power offers a path to energy independence. CANDU® reactors use natural uranium mined and processed in Canada providing lower costs and a stable, secure energy supply which is essential for the growth and development of communities.

Robust Safety Systems.
Modern nuclear reactors are equipped with advanced safety systems that make them incredibly safe. The industry is one of the most regulated in the world and facilities are inspected regularly to ensure they meet or exceed strict safety standards established by the Canadian Nuclear Safety Commission and adhere to global safety recommendations set by the International Atomic Energy Agency (IAEA).

The Science of Nuclear Power

Nuclear energy is the energy released from the nucleus (core) of atoms, primarily through a process known as **nuclear fission.** Fission is a reaction that occurs when atoms of uranium or plutonium are split into two or more smaller nuclei. The process releases large amounts of energy in the form of heat, which is converted into electricity by creating steam in a nuclear power plant.

Nuclear Power Generation



How Does a Nuclear Power Plant Work?

Nuclear Fission.

The process begins in the reactor, where uranium atoms are split by neutrons. This releases a significant amount of heat.

Steam Generation.

The heat produced by fission turns water into steam.

Turbine Rotation.

The steam spins a turbine connected to a generator, which produces electricity.

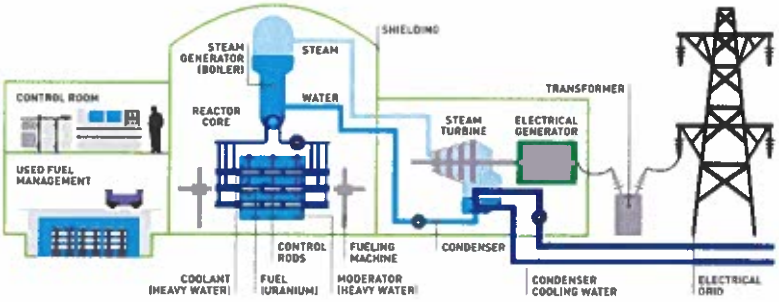
Cooling.

After passing through the turbine, the steam is cooled and returned to water, which is then heated again to repeat the cycle. The cooling water used in this process is kept separate from the steam cycle and does not come into contact with the reactor core.

Waste Management.

All of Canada's used nuclear fuel is safely managed at licensed storage facilities.

CANDU REACTOR SCHEMATIC



Graphic Source: Canadian Nuclear Association

Fueling the Future

Canada has been producing nuclear energy since the 1960s. A reactor needs 10 uranium pellets to power a house for a year. Each pellet weighs about 20g, less than a AA battery.

Generating the same amount of electricity as one uranium pellet would require 410 litres of oil. A typical generator supplying power for one million people will produce about three cubic metres of waste per year.