



#### Contents

Introduction

President's message

Medical isotopes

Sending hope to the world

Investing in nuclear

A clean energy future S<mark>a</mark>fe, reliable operati<mark>o</mark>n

Safety first

Carbon-free electricity

Powering
Ontario's growth

Environment

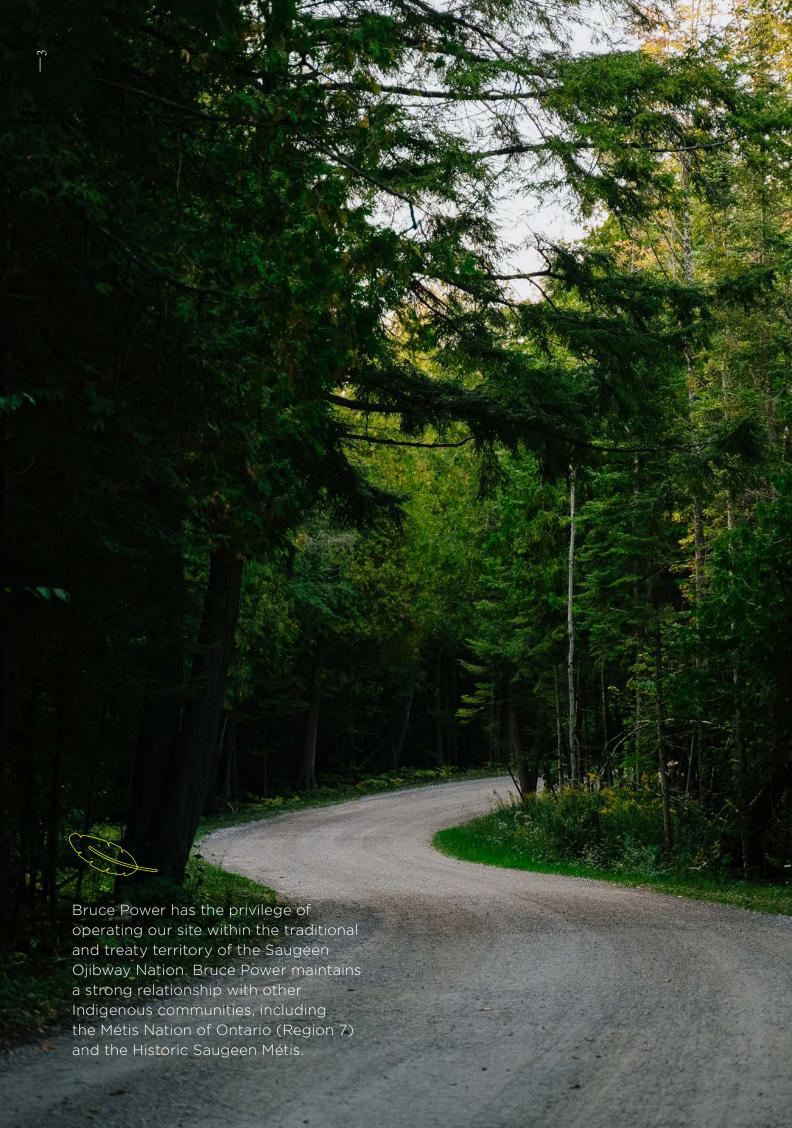
Dur impact matters

Life-Extension Program

Renew for the future

Community

Our asset is our people





### A message from the President

We're immensely proud of our people, communities and industry partners on the accomplishments in 2023 and to be able to share our journey with you as we continue along the pathway to a clean energy future.

Our Major Component Replacement (MCR) Project took important strides with the completion of the Unit 6 MCR outage, returning the renewed unit to service safely, ahead of schedule and with quality, to serve the people of Ontario for decades to come.

It was a monumental year for Bruce Power with our units operating among the best in the industry and Unit 7 setting its site record for continuous operation.

We also marked the one-year anniversary of our innovative Isotope Production System, and our Gamzook'aamin aakoziwin partnership with the Saugeen Ojibway Nation (SON), as we continue to help make Canada a global leader in supplying cancer-fighting medical isotopes to the world's health care community.

From the site's early beginnings as host of Canada's first commercial nuclear reactor in the 1960s at Douglas Point, to the Bruce A and Bruce B development in the 1970s and 1980s, and now our Life-Extension Program, we are on a long-term journey. The next chapter of clean energy opened in 2023 when the Government of Ontario announced its interest in beginning exploration into nuclear expansion options.

It's evident today that the best path to a clean energy future to meet Ontario's climate change goals includes nuclear and our Life-Extension renewing units to provide that baseload energy for decades to come. We're securing clean energy for tomorrow.

As you will see in our 2023 Annual Review and Energy Report, Bruce Power is powering the future.

Mike Rencheck,

President and Chief Executive Officer

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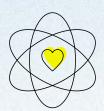
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CANDU REACTORS

#### MAJOR COMPONENT REPLACEMENT

Bruce Power's Life-Extension Program and Major Component Replacement (MCR)
Project continued with a successful year in which Unit 6 was returned to service ahead
of schedule and with quality, and Unit 3's MCR outage began.





\$2.06

#### MILLION

Community donations by Bruce Power in 2023. 22,000

DIRECT AND INDIRECT JOBS ANNUALLY SUPPORTED BY BRUCE POWER'S OPERATIONS.

#### 45 YEARS

Bruce Power's Unit 3 marked 45 years of commercial operation on Feb. 1.





#### NET ZERO NUCLEAR INDUSTRY PLEDGE

Canada and more than 20 other countries have launched a declaration to triple global nuclear generation capacity by 2050. Bruce Power signed a Net Zero Nuclear Industry Pledge to help achieve this lofty goal. The pledge commits the company to continue to work toward this ambitious goal in support of global decarbonization and clean energy efforts. Bruce Power's Life-Extension Program, project work and potential Bruce C Project support this declaration and prosperity for the next century of nuclear.

98%

Percentage of Bruce Power's capital and resource costs that are spent in Canada.

The company's supply chain supports hundreds of businesses throughout the province of Ontario.

#### GOLD CANADIAN COUNCIL FOR ABORIGINAL BUSINESS

Bruce Power was awarded a Gold certification for the fourth consecutive time by the Canadian Council for Aboriginal Business (CCAB) for excellence in Indigenous Relations.



70%

of the power the province needed to shut down coal stations was provided by the return of Bruce Power Units 1-4.





"Canadians are advancing climate action through strategic investments in clean energy technologies and critical minerals, ambitious regulatory measures to cut pollution, and multilateral co-operation agreements to secure our long-term prosperity.

Canada is determined to lead in collaboratively building a more sustainable and prosperous future."

The Hon. Jonathan Wilkinson, Canada's Minister of Energy and Natural Resources

Investing in nuclear

# Aclean energy future

## Canada joins pledge to triple nuclear capacity by 2050

In December, Canada was one of more than 20 countries to sign a new Ministerial Declaration to triple nuclear energy by 2050. The declaration is recognition of the nuclear industry's importance in achieving global net-zero targets by 2050 and keeping the goal of limiting overall worldwide temperature rise to 1.5 C within reach.

The Ministerial Declaration is a significant call to action, which occurred during the World Climate Action Summit of the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP28).

Nuclear is already one of the largest sources of clean baseload power worldwide. The Declaration cited analysis from the International Energy Agency (IEA) showing nuclear power more than doubling from 2020 to 2050 in global net-zero emissions by 2050 scenarios and shows that decreasing nuclear power would make reaching net zero more difficult and costly.

Bruce Power was at COP28, and in co-ordination with the Ministerial Pledge, joined 119 other nuclear industry signatories active in 140 countries worldwide in signing a Net Zero Nuclear Industry Pledge to help achieve this lofty goal. This pledge is recognition that a viable net-zero strategy should include a substantial increase in the share of electricity provided by nuclear energy, and the need for the nuclear energy to grow at a faster rate than the projected growth in global electricity demand.

The Industry Pledge is part of Bruce Power's ongoing commitment to support future clean energy targets by renewing its fleet through its Life-Extension Program and Major Component Replacement projects, investing in increasing net peak output from its existing assets through Project 2030 and starting the process to study the feasibility and impacts of new nuclear with its Bruce C Project.

25%

Amount of clean, low-carbon electricity nuclear provides worldwide. 1.5 C

COP28 declaration recognizes the key role of nuclear energy in keeping within reach the goal of limiting temperature rise to 1.5 C by 2050. 2-3 X

Analysis from the International Energy Agency shows nuclear power more than doubling from 2020 to 2050 in global net-zero emissions by 2050 scenarios.







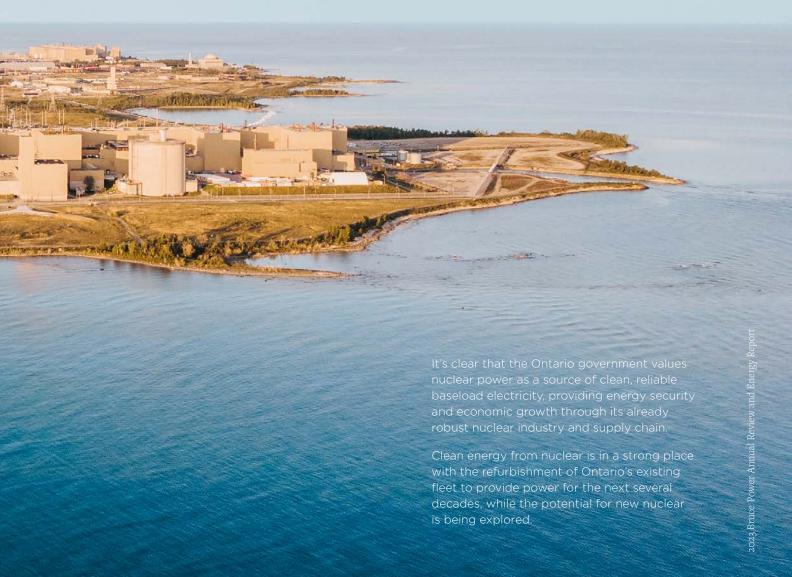


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## Exploring new nuclear

The Ontario government recognized the province's nuclear advantage in 2023 with the release of its *Powering Ontario's Growth* plan.

The Independent Electricity System Operator's (IESO) *Pathways to Decarbonization Report* previously had forecast the need for an additional 69,000 megawatts (MW) of non-emitting supply to meet demand and reach a zero-emissions electricity grid by 2050. The report predicted a need for 17,000 MW of additional nuclear capacity, and the IESO proposed several "no regret" actions, including beginning the planning, siting and environmental assessment work required to build new nuclear, to allow for faster implementation.



"With our plan already in place to meet demand this decade, we are starting the pre-development work to identify future generation options, including reliable, affordable and clean nuclear energy, that will power our province into the future."

— Hon. Todd Smith, Ontario Minister of Energy



### Meeting tomorrow's demand

In July, Ontario's Energy Minister, Hon. Todd Smith, brought exciting news to the Bruce Power site, announcing his government's Powering Ontario's Growth plan to address long-term electrification needs to grow the economy and achieve net zero goals.

As part of that plan, the government announced support to advance long-term planning work required to explore expansion with up to 4,800 megawatts of new nuclear at the Bruce Power site.

Bruce Power is uniquely positioned for expansion with decades of experience, a well-studied site with significant space for expansion, and an experienced and dedicated workforce.

The Bruce C Project will begin a multi-year planning process, which involves Indigenous, municipal and public engagement, environmental and socioeconomic studies, and permitting activities. This planning work is an important step to inform future electricity planning, and will allow for faster implementation if a decision is made to advance a new build at Bruce Power.











"It's evident that the best path to a clean energy future to meet Ontario's climate change goals includes nuclear and our MCR Project's renewed units will provide that baseload energy for decades to come."

- Mike Rencheck, President and CEO

#### Carbon-free electricity

# Powering Ontario's growth

Bruce Power is a crucial part of Ontario's clean energy grid, past, present and future.



 Chris Mudrick, Executive Vice-President and Chief Nuclear Officer

Zero-emissions nuclear power is the backbone of Ontario's clean electricity generation.

The province has a deeply decarbonized electricity grid that is the envy of jurisdictions around the world thanks to a clean baseload supply of nuclear and hydroelectricity.

Bruce Power was the site of one of the largest greenhouse gas reduction initiatives in the world when the company returned the Bruce A units to service in 2013 and improved their performance to leading operational standards from when the site was assumed by Bruce Power in 2001. This led to 70 per cent of the energy needed to phase out the use of coal in Ontario.

Today, Bruce Power generates 30 per cent of Ontario's electricity, powering one in three homes, businesses and hospitals with reliable, clean, zero-carbon electricity, while also producing cancer-fighting medical isotopes.

28%
Bruce
Power

25% Hydro

13% Gas

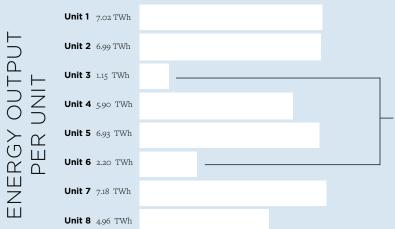
8% Wind

0.7% Solar .5 and Biofuel .2%



#### ELECTRICITY GENERATION (2023)

Electricity supply in Ontario comes from a diverse mix of fuel types: wind, solar, hydro (water), natural gas, and nuclear. Zero-carbon nuclear electricity is the backbone of our grid, providing 53% of electricity in Ontario, with 28% coming from Bruce Power.



Units 3 and 6 were offline for parts of 2023 for their Major Component Replacement outages.

#### The path of electricity



#### **GENERATION**

Generators include Bruce Power nuclear and other sources such as hydro, wind and solar.

Each of Bruce Power's eight units produces up to 826 megawatts of clean energy.

Bruce Power's CANDU reactors produce heat from uranium pellets to create steam, drive a turbine, and generate electricity. One 20-gram pellet of uranium contains as much potential energy as 205 litres of oil.

1



#### TRANSMISSION

Power travels from the generator companies to the high-voltage transmission lines. Ninety-seven per cent of these lines are owned by Hydro One.

2

The high-voltage lines deliver power to your utility company. They own and operate the distribution system — the lines and equipment that deliver power to your home or business.

Electricity flows through heavily insulated wires to a step-up transformer. This raises voltage to as high as 750,000 volts, so it can travel long distances over the grid and across Ontario.

4

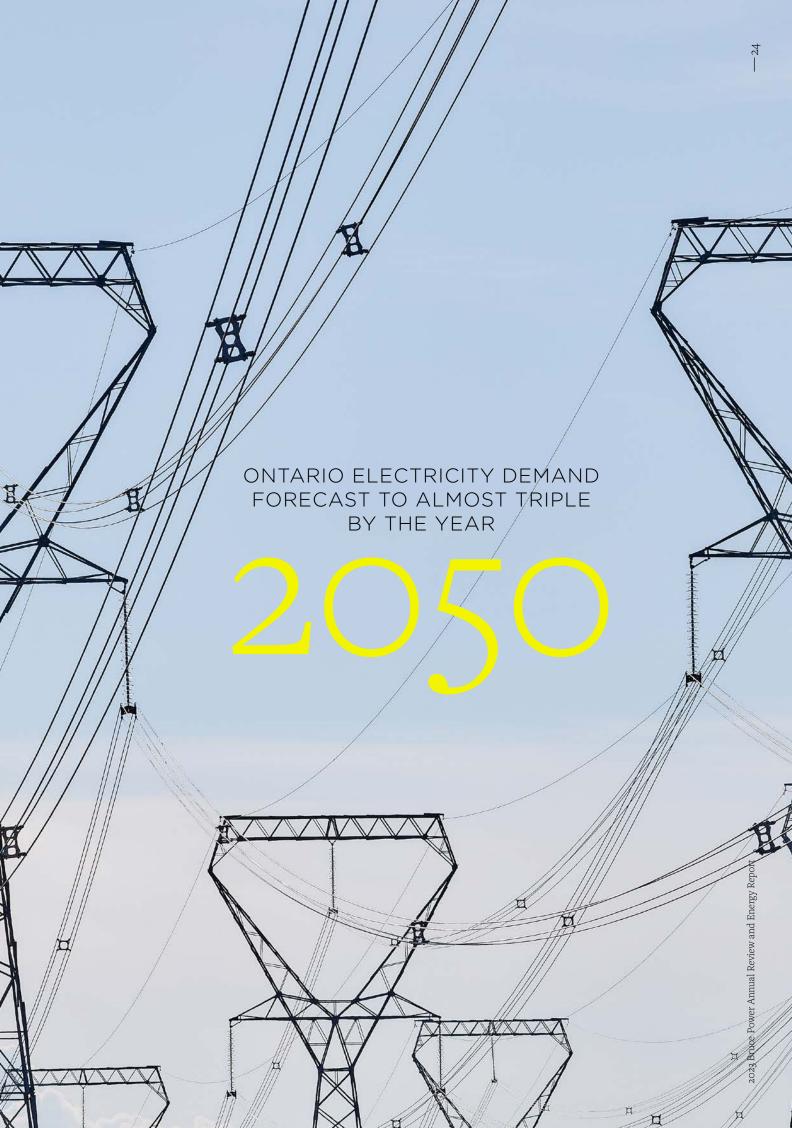
DISTRIBUTION



#### YOUR HOME

Ontario's diverse supply mix, with nuclear as its backbone, ensures that the lights turn on in your home every time.

Power from a single Bruce Power nuclear unit can generate enough electricity to be delivered to 900,000 Ontario homes.







#### Bruce Power's Life-Extension Program,

Ontario's largest private-sector clean energy infrastructure project, will extend the life of the company's existing units to 2064 and beyond.

The private investment in the company's Major Component Replacement (MCR) Projects and lifetime Asset Management Program are providing the province with a stable source of clean, carbon-free electricity for decades to come.

The Life-Extension Program started in 2016 and remains on plan while it continues to be implemented in accordance to best project practices, delivering results for Ontario.

#### Life-Extension Program

# Renew forthe functions

"Returning the renewed Unit 6 to service 39 years after it was originally declared operational is symbolic in that it makes the case for nuclear as the right choice for the people of Ontario in the past and moving forward. Ontario's nuclear industry, supply chain and skilled workforce continues to prove that we're fully capable of completing large projects on schedule and on budget and that refurbishing our existing assets is the right thing to do to power Ontario forward to a clean energy future."

- Mike Rencheck, President and CEO











#### Unit 6 Major Component Replacement a resounding success

It was serendipitous that a renewed Unit 6 was declared commercially operational following its Major Component Replacement (MCR) outage on Sept. 14, 39 years to the day of its first in-service date in 1984.

What was not by chance, however, was the fact that Bruce Power's first MCR outage was completed successfully and with an industry best safety rating for large projects.

The Unit 6 MCR began in January 2020 and was completed ahead of schedule and on budget despite the challenges of the COVID-19 pandemic, thanks to the efforts of dedicated Bruce Power employees, industry partners and skilled tradespeople.

Returning the renewed asset to commercial operation marked the beginning of a new operational life of the unit to provide clean, reliable power to the people of Ontario for more than four decades, a period in which the Independent Electricity System Operator (IESO) forecasts the demand for clean energy to more than double.

Unit 6's production is forecast to result in the avoidance of approximately 2.6 million tonnes of carbon dioxide equivalent emissions ( $tCO_2e$ ) from Ontario's electricity grid annually, compared to carbon-emitting energy sources. Over the lifetime of Unit 6, its output is expected to result in the avoidance of over 90.5 million  $tCO_2e$  in emissions, meaning cleaner air for the people of Ontario.

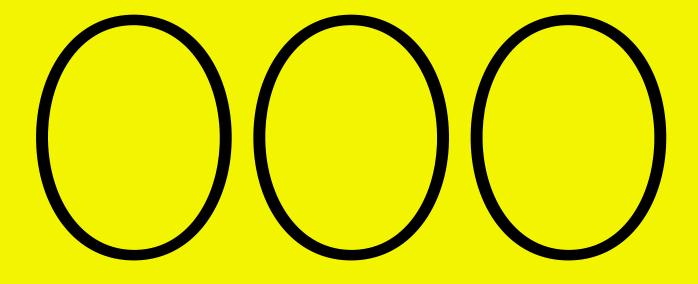
# Unit 6 powers more than

9000

### homes in Ontario



From the moment Bruce Power's Unit 6 synchronized to the Ontario grid on Sept. 8 following its 45-month Major Component Replacement (MCR) outage, it was producing enough electricity to power hundreds of thousands of homes, ramping up to full commercial operation on Sept. 14, 39 years to the day of its first in-service date in 1984.



Today, Unit 6 produces enough clean, zero-carbon electricity to power more than 900,000 homes in Ontario, and is just one of Bruce Power's eight units.

Bruce Power's zero-emissions nuclear electricity is a critical part of Ontario's clean-energy system, providing reliable, carbon-free power for the dynamic needs of our province. Even with one of its units off-line for MCR upgrades for most of 2023, Bruce A's four-unit station produced 50 per cent more carbon-free electricity for Ontario than wind and solar generation combined.

Bruce Power's strong output throughout 2023 resulted in the company producing almost 30 per cent of the power for the province. The Unit 6 MCR was completed ahead of schedule, while Unit 3 came off-line in March to begin its MCR outage. Thanks to these investments being made today, we will continue to provide reliable, emissions-free electricity for decades to come.

"We're proud of the people who have worked on our Life-Extension Program and the Unit 6 MCR and it's their strong performance that has allowed us to give back to the people of Ontario."



# Giving back through our strong performance in Unit 6 MCR outage

Ontario's electricity system and its consumers will benefit from Bruce Power's Unit 6 Major Component Replacement (MCR) outage, which saw the unit come back online in September ahead of schedule, safety performance and cost estimates.

As part of its refurbishment agreement with the Independent Electricity System Operator (IESO), Bruce Power will share approximately \$50 million in savings through a reduction in its price of power beginning in April 2024. The company's privately funded Life-Extension Program is structured to provide reliable, non-emitting electricity to the people, businesses and hospitals of Ontario for decades to come, but also to give back to consumers through innovation and efficiencies gained over the span of the project.

Bruce Power's Life-Extension Program remains on schedule with the Unit 3 MCR outage progressing through its removal and replacement series. Unit 3 MCR outage is leveraging innovation and efficiencies gained in Unit 6, and plans are in place to continually improve performance during the refurbishment of Units 4, 5, 7 and 8 over the coming decade.

"Our agreement with the IESO to refurbish our units is built around sharing our successes with the consumer and providing clean, reliable energy until 2064 and beyond," said Mike Rencheck, Bruce Power President and CEO. "As a private-sector company, we're focused on operational excellence and efficiency and we're committed to providing the lowest-cost nuclear energy in Ontario by continually improving our performance."

Bruce Power's Life-Extension Program is Ontario's largest clean-energy initiative and one of Canada's largest private-sector infrastructure projects, funded by privatesector investors. Bruce Power provides between \$9 billion and \$12 billion in direct and indirect economic activity in Canada from operations and its Life-Extension Program, creating and sustaining tens of thousands of jobs, and economic development.

"Along with our partners and skilled tradespeople who work on our site, we're driving our Life-Extension Program forward to help the province reach its economic and climate change goals."

Eric Chassard, Executive Vice-President,
 Projects and Engineering









## Unit 3 MCR and future projects

Bruce Power's Major Component Replacement (MCR) Project will see Units 3-8 renewed and back in service by 2033 to contribute to Ontario's clean-energy future into the 2060s.

The Unit 3 MCR outage began in March following successful planning and preparation work. The removal and replacement of major components includes 480 fuel channels, 960 feeder tubes, eight steam generators, and many other upgrades. This will allow Bruce Power to return Unit 3 to service by 2026, with new reactor components to supply clean energy to the province as demand rises in the decades to come.

Shoreline, a joint venture between Aecon, AtkinsRéalis and United Engineers & Constructors, began the Fuel Channel Feeder Replacement (FCFR) program, which sees the removal and replacement of pressure tubes, calandria tubes, and feeders inside the reactor. Shoreline completed the FCFR program for Unit 6 and has also been awarded the contract for Bruce Power's remaining MCR projects in Units 4, 5, 7 and 8.

Bruce Power projects create an estimated 22,000 jobs directly and indirectly from operations, and an additional 5,000 jobs annually throughout the investment program.

#### Major Component Replacement

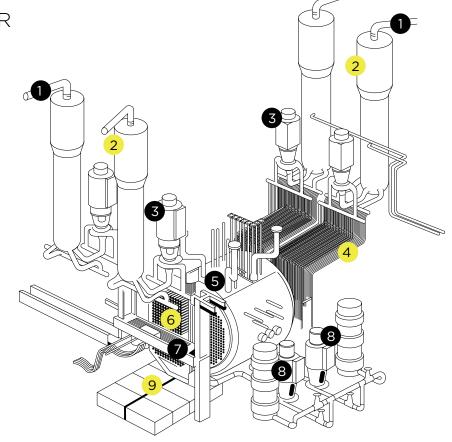
#### SCOPE OF MCR



= FOUR MAIN PROJECTS

#### Legend

- Main Steam Supply
   Piping
- 2. Steam Generators
- 3. Main Primary Supply Pumps
- 4. Feeders
- 5. Calandria Assembly
- 6. Fuel Channel Assembly
- 7. Fueling Machine Bridge
- 8. Moderator Circulating System
- 9. Bulkheads

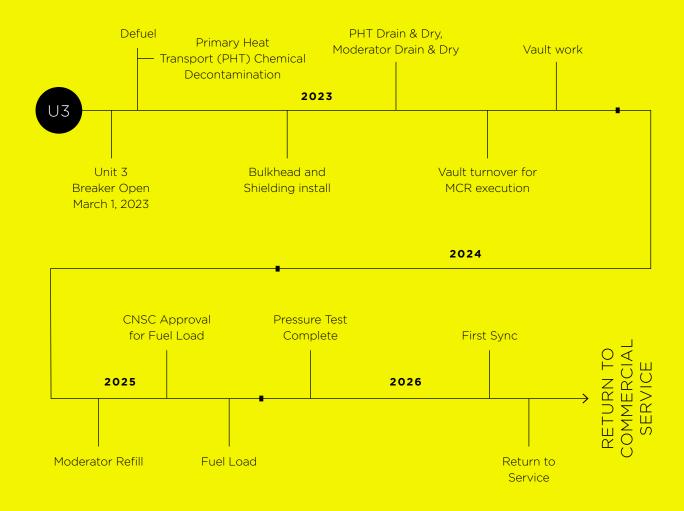


#### MCR STEAM GENERATOR

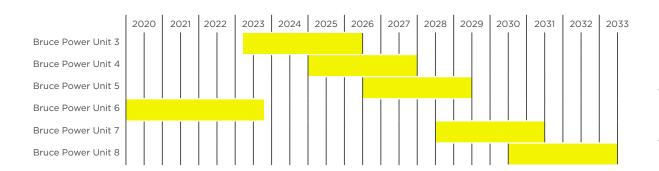
The 160-ton steam generators are staged in storage for use in future Major Component Replacement outages. These massive steam generators are made in Ontario by BWXT and are cared for by Bruce Power's MCR Rigging and Lifting team and partners from Western Mechanical, ES FOX and the Iron Workers Union.



#### Unit 3 project overview



#### MAJOR COMPONENT REPLACEMENT SCHEDULE



## Innovation at work

Bruce Power's tagline is Innovation at Work, and we strive to live this motto every day to provide safe, clean and reliable power for the people of Ontario

Whether it's in the daily operation of the units, outages or project work, the company and its partners are continuously learning and applying experience to come up with new, innovative ways to apply a vast knowledge of the nuclear industry to improve performance.

It's an exciting time with the introduction of emerging technologies such as Artificial Intelligence (AI) and the implementation of advanced robotics. Bruce Power is leveraging these new tools to enhance safe operation and find efficiencies.

In 2023, the company made great strides in a project that will provide virtual mapping of our stations, showing all equipment and its status, giving Operations and Engineering real-time data at their fingertips.

Whether it's in our unit vaults or in the irradiated fuel bays, robots are already being used to perform tasks to save potential dose to workers, increasing our safety performance.

Bruce Power employees are also helping to drive innovation. In 2023, employees led a successful project to 3D print tungsten components to be used in radiation shielding.

#### POWERING UP INNOVATION

Project 2030 is a Bruce Power initiative that will support Ontario's climate change targets and future clean energy needs by targeting a site net peak capability of 7,000 Megawatts (MW) by the early-2030s.



900,000 more Ontario homes to be powered through Project 2030, the equivalent of adding a ninth large-scale reactor to the site without the need to build additional infrastructure.



Project 2030 will incrementally increase the site generation output through the optimization of existing assets, innovation and leveraging new, efficient technologies.

#### PROJECT 2030 TIMELINE







Bruce Power has led the advancement of medical isotope innovation in power reactors. A new era in nuclear medicine is emerging.

#### Medical isotopes

# Sending hope to the world





## We are helping in the fight against cancer

Canada has been a leader in the research, development, and production of medical isotopes for decades, contributing to the fight against cancer and transforming patient experiences.

Canada is a leader in the fight against cancer and disease, but it's a time to make a renewed commitment to improving patient experiences and developing new treatments. Considering the rising global demand for medical isotopes, Canada faces a critical juncture to build on our progress, capabilities, and expertise and outline a bold vision for the future. We believe Canada can be positioned to double its production of medical isotopes by 2030.

## Worldwide demand

In 2023, Bruce Power focused on innovations to its existing isotope program to increase production of cobalt-60 and lutetium-177 to meet growing worldwide demand.

A new adjuster component configuration was completed to increase output of cobalt-60, used in the sterilization of billions of medical devices and the treatment of some forms of cancer; while the first phase of innovations to increase the capacity of the Isotope Production System used to produce lutetium-177 were completed in August.

New discoveries for the use of medical isotopes have opened additional pathways for researchers and health care professionals to improve lives through targeted cancer therapies, and demand for isotopes is growing steadily as our understanding for applying these powerful medical tools is harnessed and treatments are developed for an expanding list of cancers.

Bruce Power is proud of the role it plays in powering medical innovation and fighting cancer. Together, scientists, researchers, doctors and the nuclear industry are building a better tomorrow.

Actual Size — 2.5" in length

#### IPS target

A target containing ytterbium-176 is sent into Bruce Power's Isotope Production System (IPS) and irradiated in the reactor core to become lutetium-177, a cancer-fighting medical isotope.

#### 40 million

More than 40 million nuclear medicine procedures are performed around the globe each year using medical isotopes, with approximately 36 million for diagnostic nuclear medicine and four million for therapy.



"Our government is proud to partner in the creation of the Canadian Medical Isotope Ecosystem, which includes support for the SON First Nations communities' partnership with Bruce Power to innovate in the fight against cancer."

Hon. François-Philippe Champagne,
 Minister of Innovation, Science and Industry

#### Cobalt-60

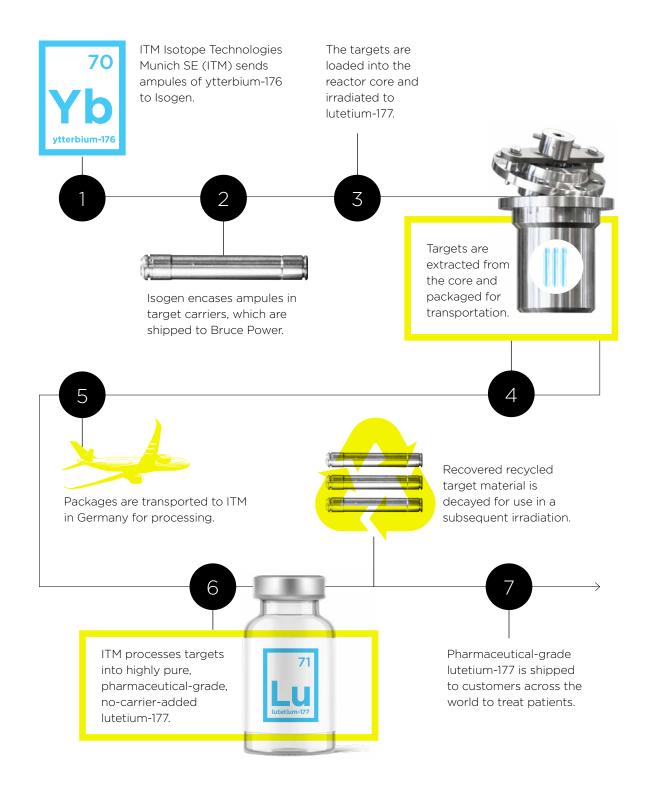
In October, Bruce Power successfully completed a harvest of cobalt-60 during a planned outage in Unit 8, and executed the installation of system innovations to increase the production of cobalt-60 for the next harvest to meet the growing demands of the world market.

Cobalt-60 harvested from Bruce Power is used to sterilize billions of single-use medical devices such as syringes, surgical masks, gloves and gowns each year.

This year's harvest also included delivery of High Specific Activity (HSA) cobalt-60, a medical-grade cobalt-60 used in the treatment of specialized brain tumours and breast cancers through non-invasive procedures. HSA cobalt-60 radiation therapies limit damage to healthy tissues by delivering a single, high dose of radiation with a high degree of accuracy to the target, reducing the side effects for some patients when compared to other types of radiation therapy.

## Lutetium-177 production process

Ytterbium-176 is irradiated to become ytterbium-177 and decays to lutetium-177 in the Isotope Production System in Bruce Power's Unit 7, allowing for the full production cycle to complete while the unit is online.



#### Cancer-fighting lutetium-177

In October, Bruce Power and its partners celebrated the one-year anniversary of producing cancerfighting lutetium-177 for cancer patients, doctors, and researchers across the globe.

During its inaugural year of operations, Bruce Power and its partners invested in several enhancements to the Isotope Production System (IPS) to increase isotope supply as demand for lutetium-177 increases worldwide. The innovations to the system increase the amount of ytterbium-176 inside each target that is sent through the IPS to be irradiated into lutetium-177, ensuring each production cycle yields more usable medical isotope.

As cancer treatments using lutetium-177 become more commonplace, Bruce Power and its partners are working on further enhancements to the IPS to ensure reliable production capacity to meet the growing demand for this powerful cancer-fighting isotope, which is being successfully used in various clinical and commercial radio-pharmaceutical cancer treatments.

Bruce Power is the first commercial power reactor in the world capable of producing short-lived medical isotopes through its groundbreaking IPS, installed in Unit 7. The IPS in Unit 7 is a unique international collaboration between Bruce Power, Isogen (a Kinectrics and Framatome company), ITM Isotope Technologies Munich and Saugeen Ojibway Nation.



#### Fighting cancer together

Bruce Power is committed to working toward true reconciliation and building partnerships that offer real and tangible benefits for Indigenous communities.
Bruce Power has partnered with Saugeen Ojibway Nation (SON) in an historic collaboration to market medical isotopes.

The partnership, named "Gamzook'aamin aakoziwin," which translates to "We are teaming up on the sickness," includes an equity stake for SON and a revenue-sharing program that provides a direct benefit to the community, for the marketing of current and new isotopes produced through the Isotope Production System (IPS).

In December, Bruce Power and SON celebrated the first full year of commercial operation of the IPS, resulting in full equity benefit of the partnership to SON communities. Bruce Power and SON also began discussions in 2023 on expansion opportunities for continued growth of the Gamzook'aamin aakoziwin partnership.

The Gamzook'aamin aakoziwin partnership supports the global fight against cancer while creating new, meaningful economic opportunities within SON Territory. It is a demonstration of Bruce Power's recognition that the next 50 years of Bruce Power operation in SON Territory must be different than the past 50 years as we move forward, fighting cancer together.

fightingcancertogether.ca



Gamzook'aamin aakoziwin

- "We're pleased that our Gamzook'aamin aakoziwin partnership with Bruce Power is giving patients around the world access to cancer-fighting treatments."
  - Chief Greg Nadjiwon, Chippewas of Nawash Unceded First Nation
- "We are proud to be part of this innovative project, which will deliver benefits beyond the local community, to people across the world in the global fight against cancer."
- Chief Conrad Ritchie, Chippewas of Saugeen First Nation



Bruce Power remains committed to living its number one value of Safety First and protecting its employees, the public and the environment through a relentless focus on continuous improvement and safety.

Bruce Power's commitment to Safety First drives every decision the company makes, and every activity it carries out. The ongoing and robust maintenance and testing programs continue to evolve as the company embraces new, innovative technology to further enhance robust safety and testing systems.

Safe, reliable operation

## Safety first



## Award-winning innovation in safety

Bruce Power's commitment to continuous improvement in safety was recognized in 2023 with a prestigious industry innovation award for a first-of-a-kind safety system.

In 2022, Bruce Power finalized installation of a game-changing safety system, the Containment Filtered Ventilation System (CFVS). Bruce Power has spent hundreds of millions of dollars to enhance safety systems as it continues to provide clean and reliable energy to the Province of Ontario.

The award-winning CFVS, developed in partnership with Framatome, has been added to the vacuum buildings at both the Bruce A and B stations. The CFVS is designed to filter radioactive materials, effectively preventing release to the environment in the highly unlikely event of an accident in the reactor.

The CFVS is unique among the existing safety systems at Bruce Power in that it works independently of all other safety systems and does not require electrical power to function, providing an additional layer of safety for plant personnel. The system was an ambitious project which took years of design, modelling and testing that spanned the globe to deliver a final product that will enhance the existing robust safety and emergency response systems already in place.

This project earned Bruce Power a Top Innovative Practice (TIP) Award from the Nuclear Energy Institute for industry innovation and is a prime example of Bruce Power's ongoing commitment to implementation of redundant safety systems to keep our people, communities, and environment safe.

#### VACUUM BUILDING

The vacuum building is a 45 metre-tall structure designed to suck up any radioactive steam from the reactor in a highly unlikely emergency situation.

Concrete walls more than a metre thick.

#### STEAM

The steam would then be doused with two million litres of water which is housed at the top of the structure. Eventually, as pressure builds up, the steam would need to be vented.

#### THE CFVS

The CFVS works independently of all other safety systems and is designed an additional barrier to protect the environment during an unlikely scenario.

New CFVS would filter out radioactive contaminants.

While we have never used the vacuum building in the event of a release, the new system would contain all the radioactive materials.

"The Containment Filtered
Ventilation System is a
tremendous example of how
our industry innovates and
is modernizing as part of
Bruce Power's Life-Extension
Program, pursuing safety
improvements and advancing
technologies to protect our
people, our communities and
our environment."

- Mike Rencheck, President and CEO





## Emergency response

Bruce Power maintains a robust and multi-faceted emergency response program, improving on the depth of its safety systems and ability to respond to emergencies on an ongoing basis.

In 2023, Bruce Power further enhanced its existing fire training, safety, and mitigation program, with upgrades to in-station fire safety, including new fire detection equipment, fire barriers, hot work processes, fire sensitive area identification and maintenance, and improvements to fire prevention procedures.

Nuclear professionals never stop improving the depth of our safety systems and training that allows the company to respond to any emergency on site. The team trains to expect the unexpected and plans for success with its emergency response program, which is routinely assessed and continuously improved through drills and exercises, covering everything from natural disasters to fires to nuclear emergencies and cyber attacks.

"Full-scale, integrated emergency response exercises give us an opportunity to collaborate with community partners and external stakeholders to ensure our people, our site, the public and our communities remain safe and secure."

Jennifer Edey, Senior Vice-President,
 Operational Services





Bruce Power is committed to sustainability in all areas of the business to protect the environment.





The company applies industry best standards to help ensure its Environmental, Social, and Governance (ESG) efforts

minimize the environmental and ethical impacts of its business.

Environment

## Our mpact matters



### WHAT IS ESG? Environmental, Social, and Governance (ESG) criteria are a set of standards for a company's operations that socially conscious investors use to screen potential investments. Environmental criteria consider how a company performs as a steward of nature. Social criteria examine how it manages relationships with employees, suppliers, customers, and the communities where it operates. Governance deals with a company's leadership, audits, and internal controls.

## Strong performance

As Bruce Power strives to advance its sustainability goals and further its position in minimizing the environmental impacts and upholding strong business ethics, the company is pleased to have been recognized with a strong Environmental, Social and Governance (ESG) Risk Rating in late-2023.

Continuing the trend of year-over-year improvement, Bruce Power has achieved its lowest risk rating of 12.6, maintaining a 'Low Risk' ESG Rating from third-party ESG rating agency Morningstar Sustainalytics. This places the company third globally in its sub-industry category of Independent Power Production and Traders, and in the top four per cent in the Utilities industry covered by Sustainalytics.

"We're committed to being a good steward for our people, communities and the environment. Participating in third-party assessments of our performance in these areas allows us to better understand how we can improve and strengthen sustainable business practices, while continuing to provide clean, reliable energy for the province in supporting Ontario's climate-change goals, and supplying cancer-fighting medical isotopes to the global health-care community," said Danielle La Croix, Bruce Power's Senior Director, Regulatory, Environment and Sustainability.

The ESG Risk Rating report outlined strong performance in a number of areas, including Community Involvement, Emergency Response, Diversity Programs, Waste Management and Environmental Programs and Policies.

- "We have accounted for aggregate impacts on the environment by routinely updating our assessments and measuring outcomes."
  - Jennifer Edey, Senior Vice-President,
     Operational Services

## Protecting the water

Bruce Power takes seriously its responsibility to protect the water and the ecosystem within.

We use the waters of Lake Huron to cool our units and we endeavour to minimize the impact on lake temperature and fish to the greatest extent possible. In support of the conservation, protection, management and sustainable use of Ontario's freshwater resources, Bruce Power monitors its water usage and reports on daily amounts drawn.

Bruce Power is an industry leader in lake modelling and thermal risk characterization, which includes a downscaled lake model grid for advanced localized projections.

The company works with multiple partners, including Climate Risk Institute and Council of the Great Lakes Region, to better understand climate change impacts and vulnerabilities on Lake Huron, with a focus on the area near our facility. It also participates in the Electric Power Research Institute (EPRI) Climate READi (Climate Resilience and Adaptation Initiative) and CHIP (Climate Hazard Information and Projection) programs.

By working with Indigenous communities, Bruce Power is improving its understanding of potential climate change effects on valued habitats and species and develop solutions to build resiliency.



#### Protecting the air



#### NET ZERO BY 2027

Bruce Power is continuing to contribute to a net zero Canada by 2050 by committing to achieving greenhouse gas (GHG) emissions from its site operations by 2027, making it the first nuclear operator in North America to make such an ambitious commitment.

While the company reliably produces large volumes of emissions-free electricity that is critical to Ontario staying off carbon-emitting sources, Bruce Power is taking the next step to ensure it minimizes and offsets emissions from routine undertakings such as vehicles, machinery, buildings, and equipment to achieve net zero by 2027.

This will be accomplished by implementing energy and emission-reduction projects, finding substitutes for high-emission energy sources and, if further reductions are not possible, pursuing emission offsets.

Bruce Power announced a \$1 million Carbon Offset Accelerator Fund to support carbon sequestration and offset projects in the Clean Energy Frontier region of Bruce, Grey and Huron counties and throughout Ontario.

Bruce Power has committed to a significant investment of more than \$900,000 towards partnership with the Alternative Land Use Services (ALUS) Program through its New Acre Project that will lead to measurable environmental impacts.



These 20 farmers established 220 acres of nature-based projects that will enhance local climate resilience, farm productivity and will generate ecosystem services, including:

25%

more bird species than non-ALUS farms.

200%

increase in native pollinator diversity and 300% increase in pollinator abundance.

547

tonnes CO2e reduced from the atmosphere per year.

In 2023, the partners also
launched the first of several innovative
technology pilots to advance solutions to
estimate incremental carbon reductions
from terrestrial sources. The first pilot
deployed Albo Climate's remote sensing and
machine learning solution to estimate carbon
sequestration from trees and shrubs in
Grey and Bruce counties. These figures
represent progress from Year 1 of the
project. Years 2 and 3 will each
see an additional 220 project
acres added.





#### Plan for our waste

Bruce Power is committed to minimizing the generation of radioactive and nonradioactive waste and has developed management programs that reduce its overall waste volume.

Bruce Power manages and fully funds the storage and disposal of its radioactive waste under a commercial arrangement with Ontario Power Generation (OPG).

The Nuclear Waste Management Organization (NWMO), established and funded by Canada's nuclear electricity producers, is responsible for implementing Canada's plan for the safe, long-term management of used nuclear fuel.

The plan, which is supported by Bruce Power, calls for used nuclear fuel to be contained and isolated in a deep geological repository. It also calls for a comprehensive process to engage and select a site with informed and willing hosts for the project. The NWMO is to select a single preferred site for Canada's deep geological repository in 2024.

Bruce Power supports the NWMO in its activities to help build an understanding of the project, including the potential benefits and impacts to the host region.

The repository design uses a series of barriers that work together to contain and isolate used nuclear fuel from people and the environment, including water. The repository would be at a depth that is also disconnected from watersheds (in other words, from the water we see and use) and has been for millions or billions of years.



#### Bruce Power Net Zero

Bruce Power Net Zero Inc. is focused on unlocking the potential of other complementary technologies to nuclear including storage, renewables, hydrogen, and electrified transportation to achieve a net zero future.

#### CLEAN FUELS AND HYDROGEN

Bruce Power signed a Memorandum of Understanding with Bruce Power Net Zero Inc., Greenfield Global, Hydrogen Optimized, and Hensall Co-op — all companies within the Clean Energy Frontier of Bruce, Grey and Huron counties — undertake a feasibility study undertake a feasibility study to determine opportunities for hydrogen production using this increased output enabled by Project 2030.

Bruce Power will be able to optimize its supply of both clean electricity and hydrogen-based power on the market conditions and demand for both products over the coming decades.

BPNZ also teamed with Canadian Nuclear Laboratories (CNL), Sunlit Strategic Inc., Expander Energy Inc., and Nuclear Promise X (NPX) to explore the feasibility of a project to produce clean hydrogen and low carbon intensity synthetic diesel and jet fuel from biomass using nuclear energy, utilizing Biomass Electrolysis to Liquids™ (BETL™) technology, which will be located in the Bruce County region.

With the proposal, opportunities for expansion around low carbon intensity synthetic diesel from the proposed  $\mathsf{BETL}^\mathsf{TM}$  has several potential uses in the Clean Energy Frontier region, and beyond.

#### CLEAN ENERGY CREDITS

As a leading producer of carbon-free electricity for the province, Bruce Power now offers clean energy credits (CECs) to help Ontario corporate electricity customers reach their environmental and sustainability goals.

Clean energy credits are electronic credits that businesses can purchase from Ontario clean energy generators, including nuclear operators, to offset carbon emissions from their operations in order to achieve voluntary environmental goals.

#### GREEN BONDS

In 2023, Bruce Power issued \$600 million in Green Bonds as it continues to help the province and country achieve their net zero goals through clean-energy projects.

Having issued more than \$1 billion Green Bonds to date with the inaugural issuance of \$500 million in November 2021, being a global first for nuclear power, this represents a significant milestone in the recognition of the critical role nuclear technology plays in fighting climate change and enabling a net zero future.

This was made possible by Bruce Power's track record of delivering emission-reduction projects and its leadership in environmental stewardship, which includes coal phase-out, and its commitment to be net zero by 2027 in support of a net zero Canada by 2050.



#### Project 2030

Bruce Power is unlocking the potential of using optimized output generated to enable this project.



#### \$600 million

Green Bonds issued by Bruce Power to continue to help the province and country achieve their net zero goals.

"Bruce Power was instrumental in helping Ontario move away from coal-fired generation almost a decade ago, and this announcement is another example of the leadership role Ontario's nuclear industry continues to play on the global stage."

## Carbon offset protocol an industry first

In a first for the industry, Bruce Power, in collaboration with GHD, created a carbon offset protocol for nuclear generation.

Pat Dalzell, Bruce Power's Executive Director of Corporate Affairs and Operational Services, announced the offset protocol Dec. 6 as part of the Canadian delegation at the 28th Conference of the Parties of the United Nations Framework Convention on Climate Change (COP28) in Dubai.

Based on Bruce Power's experience through its commitment to reaching net zero by 2027, its success in working with financial institutions related to its Green Bond program, and its active participation in Ontario's Clean Energy Credit program, the company understands the

importance of clean energy credits and carbon offsets being tangible, additional (supporting development of clean energy) and credible (validated and accredited).

Nuclear power provides a clean energy alternative to fossil fuel electricity generation while also providing broad impacts to the stability of the connected grid. The focus of the new protocol, under third-party validation, is to capitalize on clean nuclear generation to meet the increasing demands and allow consumers and business continue to decarbonize through electrification. It is intended to replace fossil-fuel generated electricity and offset carbon-intensive generation through additional incremental output of existing nuclear power generation facilities and potential new nuclear.



In a first for the industry, Bruce Power, in collaboration with GHD, announced the creation of a carbon offset protocol for nuclear generation at COP28 in Dubai. Making the announcement are, from left: Pat Dalzell, Bruce Power's Executive Director of Corporate Affairs and Operational Services, Hon. Todd Smith, Ontario Minister of Energy, Hon. Andrea Khanjin, Minister of the Environment, Conservation and Parks, Tej Gidda, Future Energy Global Lead, GHD, and John Gorman, President and CEO of the Canadian Nuclear Association.

#### Protecting the environment





ACRES OF NATURE-BASED PROJECTS THAT WILL LEAD TO MEASURABLE ENVIRONMENTAL IMPACTS.



#### 600 PLANTS

provided to employees for their gardens to support local biodiversity and wildlife habitat.









Energy is generated from clean, emission-free sources such as nuclear, hydro, wind or solar.

That power is supplied to the grid. Each megawatt-hour is eligible to be sold as a Clean Energy Credit (CEC).

Companies looking to offset their emissions can purchase the CEC and register it.

Proceeds from the sale of CECs will go into a Future Clean Energy Fund (FCEF), which will be used to keep electricity costs down and to fund the construction of clean electricity projects in Ontario.



of water used for once-through cooling purposes in our stations is returned directly to the lake.



#### **HECTARES**

of undisturbed forest, open, or wetland habitats on Bruce Power site.

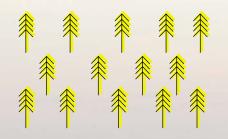
\$1.1B

ISSUANCE OF \$1.1 BILLION IN GREEN BONDS TO DATE. THE **INAUGURAL ISSUANCE IN 2021** WAS A GLOBAL FIRST FOR NUCLEAR POWER.

RISK RATING
(Environmental, Social, and Governance)

**ESG** and Governance).

an water to have the repleyable appropriation in the



200,000

Trees planted since 2018 in partnership with the Saugeen Valley Conservation Authority.









72,400 KG

Fish production increase per year since Bruce Power supported removal of Truax Dam.

Types of fish species measured with findings that there is negligible risk to fish populations from our operations.





Bruce Power understands that its greatest assets are the people who work here, the people who live in the area surrounding the site, and the people we serve across Ontario.

## Community

## Powering the economy

Bruce Power's continued operations support 22,000 direct and indirect jobs annually, and contribute \$4 billion to Ontario's economy through the direct and indirect spending in operational equipment, supplies, materials and labour income.

Approximately 480 companies directly do business with Bruce Power and these organizations in turn work with hundreds of sub-suppliers. Over the next decade, as Bruce Power refurbishes its fleet through its Life-Extension Program and Major Component Replacement (MCR) Project, it will add an incremental 5,000 direct and indirect jobs and billions in annual direct and indirect spending.

More than 90 per cent of Bruce Power's capital and resource costs are spent in Ontario and Canada, and the company's supply chain supports hundreds of businesses throughout the province.



\$4.03 billion

Ontario-wide economic impact.

## \$1.43 billion

in household spending induced by the nuclear sector in the Clean Energy Frontier region of Grey, Bruce and Huron counties.\*

\*Based on 2020 study by Economic Developers Association of Canada.





## Walking the path together to strengthen relationships

Bruce Power is dedicated to honouring Indigenous history and culture and is committed to moving forward in the spirit of reconciliation and respect, while leading by example in its community and industry.

Bruce Power has worked closely with the Saugeen Ojibway Nation (SON), Historic Saugeen Métis (HSM) and the Métis Nation of Ontario (MNO) on a variety of community engagement activities and meets regularly on items related to training, employment, business opportunities, sponsorships and special projects.

In October, the company was awarded a Gold level certification for the fourth consecutive time by the Canadian Council for Aboriginal Business (CCAB) for excellence in Indigenous relations.

Bruce Power is committed to being a good business partner, providing a great place to work, and prosperity for Indigenous communities. As part of these commitments, Bruce Power has driven actions through four key performance areas, including leadership, employment, business development and community relationships.

"We're proud of our strong relationship with the Indigenous communities which host our site and we're proud of the programs and partnerships we've formed on our continuing journey together."

 Adam Kahgee, Director, Indigenous Relations and Business Partnerships

## Gold

Bruce Power has been a Gold Certified company under Progressive Aboriginal Relations (PAR) for more than a decade.

## \$400,000

Donations to local Indigenous communities through Indigenous Community Investment Fund.

## \$50,000

Donated to the communities of Saugeen First Nation and the Chippewas of Nawash Unceded First Nation for their Youth Leaders in Training program.



Bruce Power is beginning the planning work required ahead of advancing potential new nuclear generation on the Bruce site.









## Exploring new possibilities for future generations

To support Ontario's long-term energy needs and climate-change goals, Bruce Power is evaluating the feasibility of expanding its nuclear fleet to create an option to help grow Ontario's nuclear capacity in the future.

This project, which is referred to as Bruce C, will conduct an Impact Assessment (IA) to consider the option of adding up to 4,800 megawatts

(MW) of nuclear capacity to complement the existing Bruce A and Bruce B generating facilities, which provide 30 per cent of the province's current electricity needs and cancer-fighting medical isotopes across the globe.

Although no decision has been made to advance with a project, the Bruce C IA will be used as an early engagement and planning tool for potential nuclear expansion, and is the first step in a multi-year process, to provide a high-value option for the province if it decides to expand nuclear capacity in Ontario.





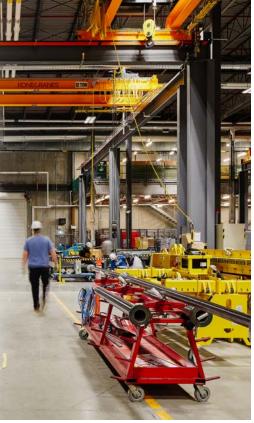














## Our guiding principles

Our approach to supporting the role of the Bruce Power site in *Powering Ontario's Growth plan* will be based on the following five guiding principles:

Extend the operation of the eight Bruce Power operating units to continue producing clean energy and cancer-fighting isotopes through 2064 and beyond.

Through Life-Extension Program and Project 2030 investments, increase net peak output of the existing units to 7,000 megawatts for the 2030s — equivalent to adding a large-scale reactor without building new infrastructure.

Pursue an Impact Assessment (IA) as a planning tool to evaluate the potential for an additional 4,800 MW at the Bruce Power site and commit to open and transparent engagement with Indigenous communities, the tri-county region and the public prior to any decision.

Undertake a robust technology review process to provide sound guidance for potential future decisions and milestones.

Position economic development/partnerships, localization, supply chain and workforce development as key priorities in development, especially in rural communities.

# The Visitors' Centre welcomed 15,000

# people into the facility in 2023.



The Bruce Power Visitors' Centre welcomed about 15,000 people last year, providing interactive and educational presentations, site bus tours, and exhibits for all ages.

Bruce Power's Summer Bus Tour Program draws thousands of participants from across Ontario, Canada and the world, providing the public with a rare look at an operating nuclear site.

Learn more at brucepower.com/visit.



# Investing in our community

The company supports many local initiatives through its community investment program and supplier partnerships, and is a staunch supporter of health care in Bruce, Grey and Huron counties.

Bruce Power is building meaningful relationships with Indigenous communities and strongly believes in community engagement and openness as it operates its business under one of its core values of social responsibility.

We continue to be recognized as a leader for our Diversity, Equity and Inclusion efforts, with a goal of making Bruce Power a safe and equitable place to work for everyone.

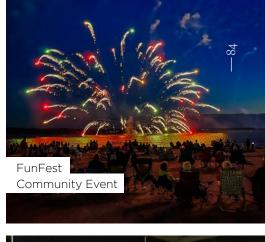
















Nawash

Pow Wow











## Canada's best employer for diversity 2023



2023

CANADA'S MOST ADMIRED CORPORATE CULTURES™



Bruce Power's Unit 6 was declared commercially operational, 39 years to the day of its first in-service date of Sept. 14, 1984.

SEPT. 14



#### CANADA'S TOP EMPLOYERS FOR YOUNG PEOPLE

Bruce Power was named as one of Canada's Top Employers for Young People for the 12th year in a row, recognition for providing a high-quality workplace and programs for those beginning their career.

#### LEADER OF THE YEAR

Mike Rencheck, Bruce Power's President and CEO, named Leader of the Year by Electricity Human Resources Canada (EHRC) for championing the company's commitment to equitable practices, strategies, and programs to benefit underrepresented communities.

"We're working to provide a workplace that is safe and welcoming to everyone, regardless of our differences."

> Karen Smith, Vice-President and Chief Human Resources Officer



Government of Canada announces funding to allow Saugeen Ojibway Nation (SON) to take the next step in Gamzook'aamin Aakoziwin partnership with Bruce Power to jointly produce, advance and market new isotopes in support of the global fight against cancer, while working together to create new economic opportunities within SON's territory.



### CANADA'S BEST EMPLOYERS

Bruce Power named among Canada's Best Employers by *Forbes*, an award based on an independent survey of more than 12,000 Canadian employees.

## Top

BRUCE POWER
NAMED AS ONE OF
DIVERSIO'S TOP 20 MOST
INNOVATIVE DIVERSITY,
EQUITY AND INCLUSION
(DEI) COMPANIES.



The quality of our air has improved immensely — decreasing smog days from 53 in 2005 to 0 in 2023.



Bruce Power named a top-rated company for Environmental, Social and Governance (ESG) Risk Rating by the third-party ESG rating agency Morningstar Sustainalytics, which included more than 15,000 companies across 42 industries.



## TOP INNOVATIVE PRACTICE AWARDS

Bruce Power awarded a Top Innovative Practice (TIP) Award for a Containment Filtered Ventilation System (CFVS), developed with Framatome, at the Nuclear Energy Institute's Nuclear Energy Assembly in Washington, DC.











Bruce Power understands the nature of its business requires a strong social licence to continue to provide clean, reliable power to the people of Ontario.

That's why the company is committed to openness and transparency with the public at large and through its regulator, the Canadian Nuclear Safety Commission.

Bruce Power engages the community through news releases, public forums, newsletters, its Visitors' Centre and through information on its website. A wealth of information can be found at **brucepower.com** and on social media, while

inquiries can be directed to **info@brucepower.com**.





