

FALL 2018

From THE Point

STATION NEWS
FOR THE COMMUNITY

Powering Growth Through Innovation

New Brunswick develops an energy research cluster to power the province's future

Safe and Sound at Point Lepreau

Another successful report card: the NB Power nuclear plant continues to meet the high safety standards required by its regulator



Énergie NB Power

POWERING GROWTH THROUGH INNOVATION

NEW BRUNSWICK DEVELOPS AN ENERGY RESEARCH CLUSTER TO POWER THE PROVINCE'S FUTURE



Point Lepreau Operation team members providing jobs for future generations.

On June 26, 2018, the New Brunswick government announced \$10 million toward development of an Advanced Small Modular Reactor (SMR) Nuclear Energy Research Cluster.

In additional separate announcements, two private companies — Advanced Reactor Concepts (ARC)

and Moltex Energy — each committed \$5 million to fund activities within New Brunswick to explore the development, licensing, and construction of advanced (SMRs) at the Point Lepreau site and to establish research and development teams in New Brunswick.

The interest in development of advanced nuclear SMRs comes from their ability to safely generate low-carbon electricity reliably and inexpensively in unique and varied roles within the electricity system.

Unique properties of SMRs include:

- They are smaller and their components can be prefabricated in factories. Due to their smaller size, their upfront capital costs are relatively low;
- SMRs simple design and operation as well as their ability to load follow and support intermittent generation sources, such as wind and solar, make them ideal in a variety of scenarios as a complement to the existing grid;
- Advanced SMR technologies are capable of using recycled spent fuel from other types of nuclear reactors or create less radioactive materials as a byproduct of operation providing additional environmental benefits;
- Advanced SMRs are inherently safe by design. They are safe for people and the environment.

The two advanced SMR technologies being studied within the research cluster are:

- ARC's 100-megawatt advanced SMR using proprietary PRISM technology from GE Hitachi Nuclear Energy;
- The Moltex Energy stable salt reactor technology, with units designed from 100 to 300 megawatts, scalable to 1,000 megawatts.

The cluster will focus on the generation of clean electricity for New Brunswick and for export to neighbouring jurisdictions looking to gain the benefits of low-carbon electricity. As well, the energy cluster partners will explore commercial opportunities to manufacture and export the technology, expertise, and components across Canada and around the world.

A job made for New Brunswickers

With a long history of nuclear energy expertise, manufacturing experience, and burgeoning centres of clean technology and entrepreneurship, the Province of New Brunswick has all the ingredients to lead on this important new energy technology.

“New Brunswick needs to broaden its participation in new and emerging sectors,” said David Campbell, chair of the New Brunswick Energy Solutions Corporation at the June announcement. The corporation is a collaborative effort between the Government of New Brunswick and New Brunswick Power. “An opportunity like this is one that this province is already well-positioned to accelerate. We already operate a conventional CANDU 6 nuclear reactor and we could capitalize from the synergies that already exist in our nuclear sector,” he said.

The energy research cluster would also build on existing research already underway at the province's universities.

“This is welcome news,” said William Cook of the Centre for Nuclear Energy Research (CNER) at the University of New Brunswick. “We have been involved in advanced nuclear reactor research and development for several years and this is another step that will help the university and CNER build upon our expertise and enhance our facilities and capabilities.”

NB Power has been an innovation leader in several areas of electricity generation developments, including the use of smart grid technology.

“At NB Power, we have consistently been leaders in innovation in our nuclear facility, generation and transmission. In fact, the Point Lepreau Nuclear Generating Station has just marked its best operational and fiscal performance since 1994,” said Gaëtan Thomas, President and CEO of NB Power. “We are pleased to continue this momentum with research that will be carried out into small modular reactors and we are confident this effort will yield employment and revenue for the Province of New Brunswick.”



A WORLDWIDE PRESENCE

NB POWER PRESIDENT AND CEO APPOINTED CHAIRMAN OF INTERNATIONAL NUCLEAR SAFETY ASSOCIATION



Gaëtan Thomas, NB Power President and CEO.

NB Power President and Chief Executive Officer, Gaëtan Thomas, was recently appointed as the new Chairman of the WANO Atlanta Centre Regional Governing Board. Thomas was the Chief Nuclear Officer at Point Lepreau from 2005 to 2010 before taking on the CEO role at NB Power in 2010. He is an electrical engineering graduate from the University of New Brunswick. A lifelong employee of the utility, Thomas has worked in all aspects of the business including being Vice President of both the Nuclear & Distribution and Customer Service divisions.

“I am honoured to serve as Chairman of the Atlanta Centre and to work with all of our nuclear professionals around the world to continue improving nuclear safety in our region and to represent our centre with the international organization,” said Mr. Thomas. “NB Power’s Point Lepreau Nuclear Generating Station has long been a WANO member and has benefited greatly from this professional association.”

At New Brunswick Power (NB Power), safety is always our first priority. Continuous learning and work with peers worldwide is an important part of maintaining a strong learning and safety culture. Through collaboration and information exchange, we stay abreast of new research and industry experience as it occurs.

One way this learning occurs is through shared membership of nuclear operators worldwide in the World Association of Nuclear Operators (WANO). WANO, which has over 130 members across the globe, is the organization

“ I am honoured to serve as Chairman of the Atlanta Centre... ”

- Gaëtan Thomas, NB Power President and CEO

that unites every company and country in the world that operates commercial nuclear power plants. Its goal is to achieve the highest possible standards of nuclear safety and excellence in operational performance. WANO is headquartered in London and, in addition to the Atlanta Centre, also has regional centres in Moscow, Paris, and Tokyo.

This year, for the third time, Mr. Thomas was named by Atlantic Business Magazine as one of the region’s Top 50 CEOs and was selected as one of the Most Influential Acadians by l’Acadie Nouvelle, New Brunswick’s French provincial daily newspaper.

PREPAREDNESS EXERCISE

NB POWER AND NB EMO TO UNDERTAKE FIRST OF A KIND EMERGENCY EXERCISE FOCUSED ON RECOVERY



NB Power & NB EMO team members at the Provincial Emergency Operation Centre.

While an emergency at the Point Lepreau Nuclear Generating Station (PLNGS) is a highly unlikely scenario, being prepared to respond is an important part of day-to-day operations.

NB Power and its emergency response partner, the New Brunswick Emergency Measures Organization (NB EMO), are holding a multi-tier and multi-jurisdictional emergency exercise on October 3 and 4, 2018. Synergy Challenge 2018 will take place at PLNGS, the provincial Emergency Operations Centre in Fredericton, the Offsite Emergency Operations Centre near Point Lepreau, and other locations, including NB Power's head office.

This will be the first recovery-based exercise at a Canadian nuclear power plant. Recovery is the final stage of emergency management and includes actions taken to repair or restore the business and surrounding communities to normalcy as quickly as possible.

As part of Point Lepreau's emergency preparedness, a comprehensive suite of emergency procedures, using an all-hazards approach, has been developed to respond to diverse types of unlikely events, including radiological, fire, medical, hazardous materials, security, and natural emergencies.

"At NB Power, safety is always our first priority, whether in our generating plants or as part of the company's electricity distribution activities," says Point Lepreau Vice President Nuclear & Chief Nuclear Officer Brett Plummer. "We are also committed to a leadership position on safety training and

responsiveness to our communities. So, we are pleased to undertake this first of its kind scenario, together with our partners, focusing on the well-being of impacted communities in the unlikely event of an emergency scenario."

The PLNGS Emergency Response Organization remains on-call 24/7 and consists of trained and qualified staff to fill a variety of roles in an emergency. Staff regularly train and practice their emergency procedures to ensure preparedness.

NB EMO is responsible for managing the Point Lepreau Nuclear Off-site Emergency Plan, which includes the Warden Service.

www.nbpower.com/en/about-us/in-the-community/point-lepreau-nuclear-generating-station

In the event of a nuclear emergency, NB Power and NB EMO would work with municipal, provincial, federal government departments, agencies, and other response partners.

"Training and exercises are not only for Point Lepreau employees," says Plummer. "All of our community, government, and service partners are dedicated to ensuring the highest standard of training and preparedness so they are ready, whatever the need."

Every three years, NB Power is required by its Canadian Nuclear Safety Commission Power Reactor Operating Licence to conduct a full-scale emergency exercise. The last one was Intrepid 2015, held in November 2015.



POWERING NEW BRUNSWICK

RELIABLE, LOW CARBON ELECTRICITY FROM POINT LEPREAU NUCLEAR GENERATING STATION (PLNGS) IS A MAJOR CONTRIBUTOR TO OUR PROSPERITY

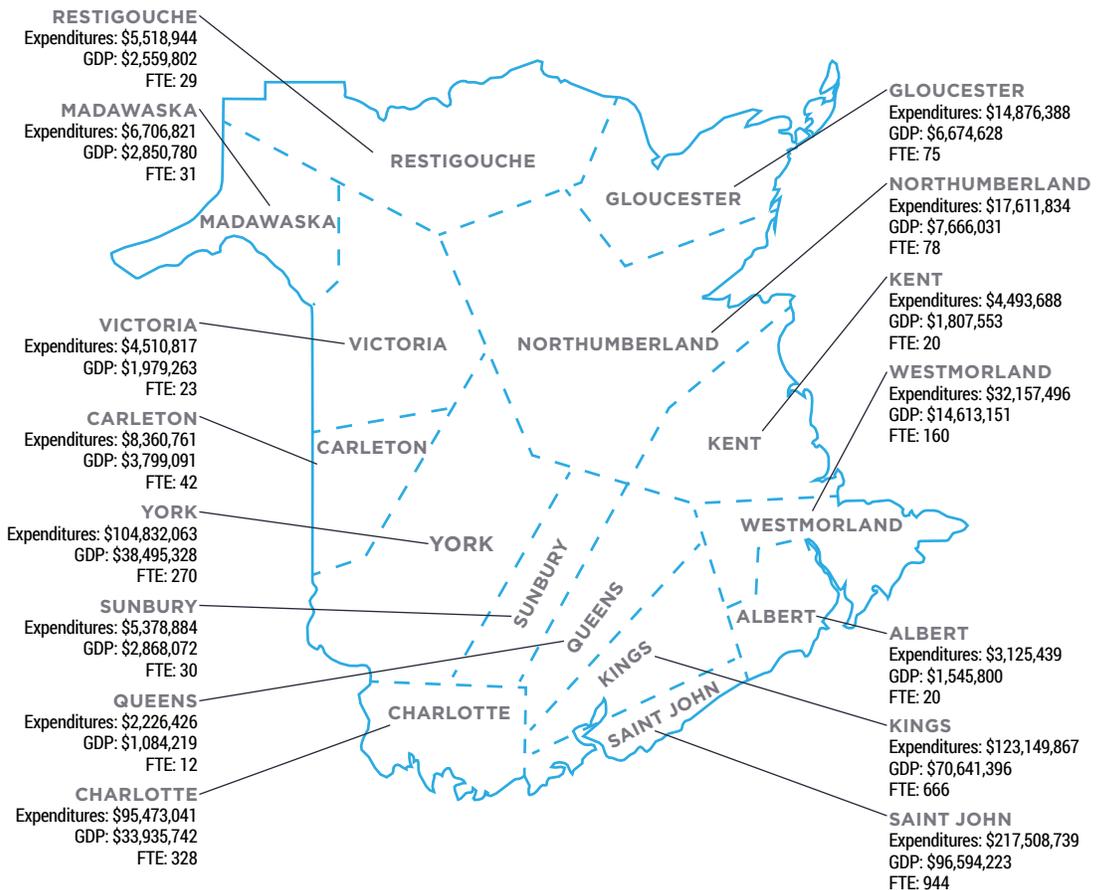
NEW BRUNSWICK ECONOMIC IMPACT MAP Benefitting the Entire Province

85% of Point Lepreau total spending occurs within New Brunswick

EXPENDITURES
Total Sales Generated by the Operations and Capital of Point Lepreau Nuclear Generating Station.

GROSS DOMESTIC PRODUCT (GDP)
Total Gross Domestic Product Generated by the Operations and Capital Expenditures of the Point Lepreau Nuclear Generating Station.

FULL-TIME EQUIVALENT (FTE) POSITIONS
Total Employment Generated by Operations and Capital of PLNGS, including direct NB Power jobs and indirect or induced jobs.



NB Power investments in PLNGS sustain and create jobs, contribute to household and business purchasing power, and add to New Brunswick government revenues used to fund facilities and services. The nuclear power industry and related technologies play important roles in building capability and resilience that

people across New Brunswick can depend on for a sustainable quality of life.

Approximately 900 highly skilled employees living in provincial communities are proud to bring these benefits to life for the people of New Brunswick.

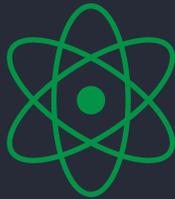


PLNGS BY THE NUMBERS

A Valuable Contributor to the Economy

Reliable power generated at Point Lepreau represents total **SALES/ EXPENDITURES OF**

\$767 MILLION



*Includes sales/expenditures in New Brunswick and Outside Province.

2,700+*

DIRECT AND INDIRECT

JOBS** established in New Brunswick



*Includes direct jobs with NB Power as well as indirect jobs with contractors, local businesses, and other supply chain participants.
**Calculated as full-time equivalent hours.

NET ADDITION TO PROVINCIAL GDP OF

\$287 MILLION



available for individual or business expenditures and investments

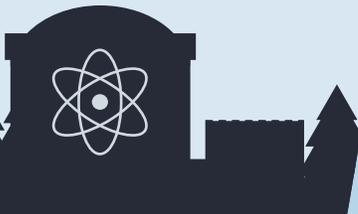
*Calculated as the difference between the value of inputs and outputs.

\$29 MILLION



in total Provincial Government **REVENUE**

IN 2017/18, PLNGS PRODUCED 5.16 TERAWATT HOURS OF LOW CARBON ENERGY;



The equivalent of **REMOVING 822,304 PASSENGER VEHICLES FROM OUR HIGHWAYS FOR ONE YEAR.**

That's 155,298 more than all the vehicles registered in New Brunswick and Prince Edward Island combined.[†]



[†]Statistics Canada Motor vehicle registrations, by province and territory last updated June 29, 2017.

This represents the avoidance of more than **4.2 MILLION TONS** OF GREENHOUSE GAS (GHG) EMISSIONS FROM ENTERING THE ENVIRONMENT.



Low carbon nuclear power is an important factor in helping **NEW BRUNSWICK ACHIEVE ITS CLIMATE CHANGE ACTION PLAN TARGETS BY REDUCING (GHG) EMISSIONS.**



SAFE AND SOUND AT POINT LEPREAU

ANOTHER SUCCESSFUL REPORT CARD: THE NB POWER NUCLEAR PLANT CONTINUES TO MEET THE HIGH SAFETY STANDARDS REQUIRED BY ITS REGULATOR



SAFETY AND CONTROL AREA	RATING
Management system	SA
Human performance management	SA
Operating performance	SA
Safety analysis	FS
Physical design	SA
Fitness for service	SA
Radiation protection	SA
Conventional health and safety	FS
Environmental protection	SA
Emergency management and fire protection	SA
Waste management	SA
Security	SA
Safeguards and non-proliferation	SA
Packaging and transport	SA
OVERALL RATING	SA

The Canadian Nuclear Safety Commission (CNSC) oversees the safety of all of Canada’s nuclear plant operations as well as mining and other uses of nuclear substances. Its mandate is to protect the health and safety of Canadians, along with the environment.

Each year, the CNSC staff produces a report on the safety performance of each of Canada’s nuclear power plants. This is just one of many regulatory oversight actions undertaken by the CNSC, which has a permanent presence on site at each nuclear plant.

The annual Regulatory Oversight Report (ROR) for Canadian Nuclear Power Plants assesses how well plant operators are performing to meet regulatory requirements and program expectations in 14 safety categories.

In 2017, Point Lepreau once again met the regulator’s expectations in all areas. With particular strengths in conventional health and safety and safety analysis being noted.

On November 7 and 8, 2018, employees from the Point Lepreau Nuclear Generating Station (PLNGS) will participate in a CNSC public meeting in Ottawa. Several topics will be discussed, including the 2017 draft report. These types of public meetings are opportunities to review the reports and openly discuss the status of the safety of nuclear power plants in Canada. This transparent process is recognized internationally as one of the strengths of the Canadian nuclear regulatory framework. The final ROR will then be issued and posted on the CNSC website.

In its 2017/18 fiscal year, Point Lepreau achieved its best station performance since 1994, including reaching 8.2 million-person hours without a lost time accident (LTA), an excellent employee safety accomplishment.

Point Lepreau’s Satisfactory integrated plant rating continues to demonstrate that we operate safely and effectively within the rigorous requirements of CNSC regulations.

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