



***Submission to the Federal Standing Committee
on Environment and Sustainable Development***

Re: Clean Technologies in Canada - Advanced Small Modular Reactors

by the Atlantica Centre for Energy

The Atlantica Centre for Energy serves as a bridge between organizations operating in the energy sector, academia, government, and other interested stakeholders to help realize opportunities associated with energy development and distribution in Atlantic Canada. The Centre is proud to serve as an informed voice with respect to the sustainable growth and evolution of our region's energy sector. Our key focus is to be the proactive voice for energy in Atlantic Canada; examining energy issues of this region and making information available to the public to help them make informed decisions.

This submission is written in response to the Federal Standing Committee on Environment and Sustainable Development's call for submissions of Clean Technologies in Canada, and will explore advanced Small Modular Reactors and the future contribution of this technology as a clean energy source for Canada and abroad.

Nuclear energy has been a reliable part of New Brunswick's electricity grid for almost four decades with the Point Lepreau Nuclear Generating Station (PLNGS). The United Nations Economic Commission for Europe (UNECE) completed a [Life Cycle Assessment Report of Electricity Generation Options](#), proving that over its full life cycle nuclear accumulates the lowest greenhouse gas (GHG) emissions, the smallest ecological footprint, and the least minerals and metals used when compared to all other evaluated energy technologies. Today, non-emitting electricity generated from nuclear power can already account for up to 60 per cent of all electricity used in New Brunswick on a given day; powering the province's homes, schools, hospitals and businesses.

The capacity factor of nuclear is much higher than that of renewable generation in Atlantic Canada, so it provides a vital source of baseload generation to help meet load peaking, especially during the coldest winter months. This will become increasingly valuable as Atlantic Canada electrifies its residential and commercial heating sources; accelerated by a recent funding program announced by Minister Guilbeault¹.

New Brunswickers are proudly securing a clean energy future with the potential development of advanced Small Modular Reactors (aSMRs). These smaller, more affordable reactors provide the flexibility needed for a clean, reliable and efficient electricity grid in New Brunswick in the transition to net-zero electricity by 2035. One of the two aSMR proponents for New Brunswick

can even deal with waste, reducing the amount of spent fuel requiring long-term storage, while generating clean electricity.

aSMR technology has a simple, modular design for efficient construction at a reasonable cost. Once built, these reactors can be similar in size to a school gymnasium yet produce up to 300 megawatts of electricity. To produce that same amount of electricity from windmills would require almost 100 square kilometers. Meanwhile, a single aSMR could generate enough electricity to meet the entire province of Prince Edward Island's annual demand.

In addition to the relatively small land use and comparatively low construction costs, the simple design enables local companies to supply components and services, while filling operations and maintenance jobs. It is also in the nature of the nuclear industry to secure local suppliers as much as possible. Currently, eighty-five per cent of spending by PLNGS flows directly into the New Brunswick economy, which provides more than 645 million dollars to help support local businesses, including goods and services, as a key economic driver in our province.

A New Brunswick supply chain event for aSMRs was held on June 14, 2022, at the Saint John Trade and Convention Centre in New Brunswick. Supported by Opportunities New Brunswick and Atlantic Canada Opportunities Agency, participants included industry, government and first nations people, representing 150 organizations.

The high level of interest to participate in the future aSMR supply chain in New Brunswick demonstrates a willingness to develop regional climate change solutions and realize the economic benefits that come with innovation.

Importantly, these energy solutions developed and manufactured in New Brunswick can be shared across the country and, potentially, even globally. Furthermore, aSMRs offer solutions to help develop future clean fuels, such as hydrogen, which can help decarbonize some of the most challenging sectors of Canada's economy, or be exported to Europe.

Canada has a short timeframe to reach its climate action goals; it is clear that pursuing novel aSMR technology can help protect the environment while ensuring Atlantic Canada has a viable and competitive economy that supports current and future generations.

The provincial utility, NB Power, is working with two leading proponents, [ARC Clean Technology](#) and [Moltex](#) to establish an advanced SMR industry.

About ARC Clean Technology



CLEAN TECHNOLOGY

ARC is a clean energy technology company developing the ARC-100, an advanced small modular reactor (aSMR) offering inherently safe, reliable, and economical carbon free power. ARC has offices in Washington DC and Saint John, New Brunswick.

Leveraging proven technology from the 30-year performance of its prototype, the ARC-100's simple, modular design provides 100 megawatts of electricity that is cost competitive with fossil fuels and provides reliable and abundant energy to complement intermittent renewables.

Important additional applications include the decarbonization of heavy industry, the fueling of low-carbon hydrogen projects, and the creation of valuable medical isotopes.

The ARC-100 has been selected by NB Power for implementation on their Point Lepreau site with completion targeted for the late 2020s, which will make it the first grid-scale advanced SMR deployed in Canada.

More information on ARC Clean Technology is available online at: www.arc-cleantech.com

About Moltex



Moltex Energy Canada Inc. (Moltex) is a nuclear technology leader that has caught the attention of governments, utilities and investors worldwide. With its innovative Stable Salt Reactor - Wasteburner (SSR-W), Moltex provides a carbon-free electricity generation solution that combines low upfront costs with reliable, large-scale power (300-500 MWe per reactor). This, coupled with inherently safe design features, makes the SSR-W suitable for siting in many communities.

The SSR-W is a molten salt reactor that uses recycled nuclear waste as fuel. This fuel is produced using Moltex's WASTE To Stable Salt (WATSS) recycling process, and offers a cost-effective, environmentally friendly, and socially acceptable solution to waste minimization.

Thanks to GridReserve, energy from the SSR-W can be stored as heat and dispatched to the grid during periods of peak demand. This allows the reactor to complement intermittent renewable sources such as wind and solar.

Moltex was selected by NB Power to progress development of its reactor technology in New Brunswick, Canada, with the goal of deploying first-of-a-kind SSR-W, WATSS and GridReserve units at the Point Lepreau site. More information on Moltex is available online at:

www.moltexenergy.com

Canada has a responsibility to develop aSMR technology and incorporate it as an important component of its mission to reach net zero by 2050. This vision is shared in Canada's 2030 Emissions Reduction Plan, as well as by the International Energy Agency.

“In December 2020, the Government of Canada launched the Small Modular Reactor (SMR) Action Plan to lay out the next steps to develop and deploy this technology as a potential tool to reduce emissions within Canada and abroad. The Government will continue to work with utilities, as well as provinces and territories, Indigenous Peoples and communities, industry, innovators, laboratories, academia, and civil society to advance SMRs through Canada’s SMR Action Plan.”

2030 emissions reduction plan: Canada's next steps to clean air and a strong economyⁱⁱ

“Alongside renewables, energy efficiency and other innovative technologies, nuclear can make a significant contribution to achieving sustainable energy goals and enhancing energy security.”

Fatih Birol, Executive Director, IEAⁱⁱⁱ

Submitted by,



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ⁱ September 15, 2022, *Making home heating more affordable for Atlantic Canada and other regions*, Environment and Climate Change Canada, www.canada.ca/en/environment-climate-change/news/2022/09/making-home-heating-more-affordable-for-atlantic-canada-and-other-regions.html

ⁱⁱ June 22, 2022, *Canada’s 2030 Emissions Reduction Plan*, Environment and Climate Change Canada <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030/plan.html>

ⁱⁱⁱ May 2019, *Nuclear Power in a Clean Energy System*, International Energy Agency, <https://www.iea.org/reports/nuclear-power-in-a-clean-energy-system>