

Written Submission for the Pre-Budget Consultations in Advance of the Upcoming Federal Budget

By: Moltex Energy

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Recommendations

- **Recommendation 1:** That the government should prioritize investments in small modular reactor (SMR) technologies, which have significant decarbonization potential, to build a greener economy and meet net zero targets.
- **Recommendation 2:** That the government should tackle legacy environmental issues, such as difficult-to-manage nuclear waste, in a cost-effective and responsible manner.
- **Recommendation 3:** That the government should focus on reducing regional inequalities and supporting traditionally “have-not” provinces such as New Brunswick.



Submission

Introduction

Canada, like the rest of the world, is living through unprecedented times. The COVID-19 pandemic is having grave economic and social ramifications, which will be felt for many years to come. It is with the current situation in mind, along with the goals of green economic recovery, innovation and resiliency that Moltex offers the federal government its recommendations.

Moltex applauds Canada on its leadership role in the development of small modular reactor (SMR) technology. The SMR Roadmap, and subsequent Action Plan signalled to governments, industry and potential customers that the country is intent on seizing this clean energy opportunity.

Moltex is an SMR company with enormous potential. Not only can Moltex help mitigate climate change, boost the economy, and spur innovation, it can address legacy environmental issues, reduce regional inequalities and help Canada maintain its nuclear advantage.

About Moltex

Moltex was founded in 2014 on the belief that nuclear power should be leading in the fight against climate change, combined with a frustration that it was not fulfilling this role to its full potential.

This led Moltex to develop a simple (and now patented) suite of technologies, including a molten salt reactor powered with recycled spent fuel (or “waste”); a process for turning waste into fuel for its reactor; and thermal energy storage technology, so its reactor can provide dispatchable power.

Moltex technology is inherently safe and physically small, making it much less expensive to build and operate.

In 2018, Moltex was selected by the Government of New Brunswick and NB Power to progress development of its reactor technology in New Brunswick, Canada, with the aim of deploying its first reactor at the Point Lepreau nuclear site by the early 2030s.

Moltex now has a well-established office in New Brunswick, with a team leading design and development activities for North America. Many others are working on Moltex technology at universities and with suppliers around the world.

Moltex’s vision is to reduce the cost of clean energy for everyone, eliminating the need for fossil fuels. Its mission is to develop revolutionary nuclear technologies which its customers urgently need to deliver clean, low-cost power.

- **Recommendation 1:** That the government should prioritize investments in small modular reactor (SMR) technologies, which have significant decarbonization potential, to build a greener economy and meet net zero targets.

- **Explanation 1:** Canada’s ambitious target of net-zero emissions by 2050 can only be achieved with a combination of decarbonization initiatives, including the deployment of abundant sources of clean electricity, including dispatchable power sources such as Moltex’s nuclear technology and intermittent power sources such as run-of-the-river hydro, wind and solar.

Moltex’s nuclear reactor technology offers clean, reliable generation, with a small land footprint, and large power output. In addition, and unlike traditional nuclear reactors, it can provide back-up power for intermittent renewables.

Thanks to its energy storage technology, Moltex can store the energy it produces as heat and use the heat to generate electricity when renewables are offline. For example, a 300 MW reactor can be used to generate 600 MW for 12 hours a day or 900 MW for eight hours a day. This partnership can enable a completely carbon-free grid, and costs significantly less than renewables plus large-scale batteries.

Furthermore, the heat Moltex produces can be used to decarbonize other areas of the economy, including heavy industry, district heating and transportation – either directly or via ultra-efficient hydrogen processes such as high temperature electrolysis – at a lower cost than coal or gas.

- **Recommendation 2:** That the government should tackle legacy environmental issues, such as difficult-to-manage nuclear waste, in a cost-effective and responsible manner.
- **Explanation 2:** Canada will have 5.5M spent fuel bundles by the time the current CANDU reactors reach the end of their operational lives. The country’s current plan is to store this waste indefinitely in a deep geological repository (DGR) at an estimated cost of \$22.3B. The fixed costs of the DGR are \$4B and the variable costs, related to the volume of waste stored, are \$18B.

Moltex’s reactor technology can use this waste to produce 6,000 MW of clean energy for 60 years, significantly reducing the volume of waste that needs to be stored in a DGR, and reducing the cost by a similar factor.

Waste minimization is a strong narrative that engenders broad support. In the SMR Action Plan, over 100 organizations endorsed a Statement of Principles. One of these principles commits stakeholders to pursue opportunities related to minimizing waste and reusing spent nuclear fuel. At this time, Moltex is the only reactor technology specifically designed to consume recycled nuclear waste.

- **Recommendation 3:** That the government should focus on reducing regional inequalities and supporting traditionally “have-not” provinces such as New Brunswick.
- **Explanation 3:** New Brunswick has one of the lowest GDP per capita of any Canadian province or territory. It has long been considered a “have-not” province, and will require high-value, well-paid jobs to ensure it can revitalize its economy.

A recent economic impact study showed that the development of two new reactors in New Brunswick would create an average of 730 direct and indirect jobs per year between 2020 and 2035. This labour market growth would contribute over \$1 billion to the provincial GDP



and result in \$120 million in provincial government revenue. And with reactor lifetimes of 60 years, these jobs and economic benefits will last far beyond 2035.

There are also export opportunities that come from having advanced reactor technologies and an accompanying supply chain. If Moltex is successful in selling its technology abroad, the products and services that support its operation will be in high demand. A supply chain study revealed that 40% of reactor components used around the world could be produced in New Brunswick. Even a small part of this business would be transformative.

It is worth noting that Moltex is committed to hiring Indigenous people and supporting Indigenous-owned businesses and has signed an agreement with the North Shore Mi'kmaq District Council to this effect, addressing another well-known area of economic inequality.

Moltex's low-cost electricity will also lead to more disposable income, and in turn stimulate the economy.