BWXT Canada Ltd.

December 11, 2024

Policy Coordination and Outreach Branch
Ministry of Energy and Electrification
77 Grenville Street, 5th floor
Toronto, ON M7A 2C1

Submitted via email: ***integratedenergyplan@ontario.ca***

RE: Submission to ERO: 019-9285 – Integrated Energy Resource Plan Consultation

BWX Technologies, Inc. ("BWXT") appreciates the opportunity to provide input to the Ministry of Energy and Electrification's ("Ministry") Integrated Energy Resource Plan ("IERP") consultation.

BWXT is Canada's most comprehensive nuclear supply chain company. We have over 60 years of expertise and experience in the designing, manufacturing, commissioning, and servicing nuclear power generation equipment, with the resources available to help fulfil capacity requirements and interests in producing emerging technologies.

As a supplier of more than 300 CANDU and pressurized water reactor steam generators worldwide - in addition to other major plant components and fuel - BWXT is on the front line of developing innovative solutions for all areas of plant operations, from the nuclear reactor itself to conventional systems, fuel handling equipment and parts, pressurizers, primary piping, critical heat exchangers and spent fuel storage. Our core business is maintaining the supply of nuclear fuel, components, services, engineering, equipment, and parts for the nuclear power industry, as well as producing nuclear medicine for life science companies, radio pharmacies, hospitals, and researchers.

Canada's nuclear industry is a vital economic engine, and largely rooted in Ontario. The industry directly and indirectly supports 76,000 high paying jobs, with a total impact on Canadian Gross Domestic Product ("GDP") of $17 billion per year. The opportunity going forward is significant.

The Ministry has stated that the overarching goal of this new planning framework is to guide the build out of an affordable, reliable and clean energy system which will meet the exceptional growth needs of Ontario. To support this initiative, BWXT is committed to playing a constructive role in this process of building and maintaining that system for the benefit of all Ontarians. We appreciate the opportunity to contribute to this consultation and stand ready to collaborate in shaping a cleaner and more reliable energy landscape.

Sincerely,

John MacQuarrie
President, Commercial Operations

I. OVERVIEW

BWXT is supportive of the Ministry acting on the recommendation of the Electrification and Energy Transition Panel ("EETP") to develop an IERP under the province's new planning framework. The IERP provides an opportunity for industry to understand the specific actions that will be required on a prescribed timeline to ensure a reliable electricity system, provides a valuable forum for stakeholder input, and will generate a transparent, long-term framework for infrastructure investment.

As part of this submission, BWXT provides considerations for the Ministry as the IERP is developed, focusing on a responsible plan for growth, supporting Ontario's supply chain, and positioning the province as an energy superpower built on a robust foundation of nuclear capacity.

II. PLANNING FOR GROWTH

The province is on the cusp of a significant new period of demand growth and energy transformation. To enable this transformation and accommodate this growth, Ontario needs more power.

The current system's ability to provide adequate energy, capacity, and ancillary services to keep pace with demand will become challenged within the next four years, driven by economic activity and industrial decarbonization initiatives, and by the temporary but meaningful loss of the Pickering Nuclear Generating Station ("NGS") at the end of 2026. Concurrently, other aging generation assets in addition to these nuclear units are reaching their end-of life, which will compound the diminishment of available resources. The need for new supplies commences in the mid-2020s as the Independent Electricity System Operator ("IESO") has forecasted demand growth of 75% over the next 25 years.

Additionally, the electrification of transportation alongside investments made for large-scale infrastructure projects, such as electric vehicle manufacturing and artificial intelligence ("AI") data processing centers, will further increase electricity needs. In attempts to hedge the need for electricity in upcoming years, the government is already acting on measures to accommodate for this growth with active competitive procurements underway, the ongoing refurbishments at Bruce Power and Ontario Power Generation ("OPG") Darlington NGS, and the construction of small modular reactors ("SMRs").

BWXT is supporting a reliable and predictable schedule for nuclear refurbishment to mitigate the effects of this tightening of supply. This reinforces the importance of close collaboration with the nuclear supply chain in considerations around the schedule for decision-making around nuclear investments. Planning for this growth will require key coordination among all stakeholders and the supply chain is a key piece in ensuring successful delivery.

Ontario's electricity needs are both certain and significant enough for the province to be advancing on all avenues that would expand the availability of clean energy options to meet these future needs. Nuclear energy has been the reliable backbone of Ontario's electricity system for decades. It provides 35 per cent of the installed capacity and satisfies more than 50 per cent of the energy needed to power the province's hospitals, schools, homes and businesses. It is reliable, low-cost and non-emitting, making it a foundational element of modern electricity systems that drive their economies and allow them to meet their decarbonization and growth objectives. Ontario's nuclear fleet has benefits that

reach well beyond electricity production. The low price of nuclear energy helps reduce costs to ratepayers and ensure price stability over the long-term. Ontario's existing nuclear facilities are essential to their local communities, creating high quality jobs, significant local investment and long-term prosperity.

Nuclear is a foundational resource to enable the electrification of our economy and keep air emissions low into the future. Ontario's global leadership in the carbon intensity (g/kWh) of its electricity system has been and will continue to be underpinned by its significant commitment to nuclear generation. Virtually all leading jurisdictions that have low carbon intensity supply mixes and which do not rely nearly exclusively on large hydroelectric resources, such as Ontario, France and Sweden, also depend on baseload nuclear to offset fossil fuels in their electricity systems. Preserving as much existing nuclear in the short-term through timely refurbishments and growing nuclear in the longer-term to through incremental utility-scale capacity and SMRs, will position Ontario to maintain its global leadership and leverage its non-emitting electricity to decarbonize other elements of the economy, including transportation, industry and buildings, in an affordable way.

III. SUPPORTING THE SUPPLY CHAIN

The price of energy is always a top-of-mind issue for Ontario families and businesses, and as such the Ministry has a responsibility to embrace a planning continuum that ensures no option to reliably supply non-emitting power is overlooked or excluded. Today, Ontario's lowest cost energy is produced by generating stations that had large capital costs and required long lead times to plan, permit, construct and commission. They are also assets that are built to serve a multi-generational purpose, represent transformative infrastructure investments for local economies, have proved essential to Ontario having the non-emitting power required to sustainably eliminate coal-fired electricity generation, and are proving essential to the province being able to lower carbon emissions in other areas of the economy.

This represents an important made-in-Ontario success story that should serve as an example to other jurisdictions struggling to reduce their emissions in a sustainable manner. Ontario can take pride in the fact that it has established itself as a global leader in reducing the carbon emitting footprint of its electricity system, while supported by a world class domestic supply chain that generates a substantial economic multiplier for investment in non-emitting nuclear energy.

Established timelines, formalized in an IERP, are important to ensure coordinated project delivery. Ontario's plan to tackle increasing demand through investment in new, multi-generational infrastructure will be vitally dependent on the supply chain's ability to deliver. Although BWXT has the capacity to support new build projects in Ontario, our production is optimized by understanding delivery schedules for long lead items well in advance. The greater the uncertainty surrounding the scheduling of orders, the higher the risk for our current resource pool of expertise will be lost. Ideally, refurbishments and new build (large and small) should be planned end-to-end and staged in a responsible cadence such that BWXT will be able to maintain a levelized workforce and the required expertise.

According to the IESO, capacity constraints will start to affect Ontarians within the coming decade. As the province will need resources to come online in a timely manner, the Ministry can prevent future development delays by creating standardized processes to enable utilities to expedite the

development of large-scale assets. To fill this supply gap, BWXT supports sustained commitments for large-scale nuclear new builds, such as Bruce C and the designation of additional OPG sites for incremental stations.

To meet the anticipated demands on the supply chain, BWXT is making significant investments to expand its Cambridge facility. As we undergo construction, we are making investments in human capital and striving to release long lead materials, manufacture, and conduct preparatory responsibilities simultaneously.

To this end, to support "Made-in-Ontario" initiatives, we need to see provincial support for major investment in capital equipment as well as enhanced tax credits and grants. Regulatory approval times need to be optimized (reduced) to reduce the cost of capital (e.g., financing expense).

Schedule efficiency can be achieved to reduce costs by:

- Modularization that is properly designed, manufactured and available at the time of construction.
- Detailed designs completed prior to the start of construction. (Historically, this is a significant contributor to cost overrun on new builds).
- Fully detailed constructability of selected design.

As part of an integrated supply solution, nuclear offers an optimum outcome for Ontario ratepayers and Ontario's economy. The province's investment in nuclear to-date and commitments to the futures of Bruce, Darlington and Pickering have created and will sustain prosperous communities and regions for generations to come. Very few other infrastructure investments can claim such a long-term and far-reaching societal benefit, and certainly across energy infrastructure there are few if any other resources that both moderate electricity rates and sustain a nationally significant economic cluster. These are considerations that the Ministry must make in its planning process and in determining the best options for infrastructure to meet future needs.

IV. POSITIONING ONTARIO AS AN ENERGY SUPERPOWER

Nuclear power is the backbone of Ontario's electricity system, representing fully one-third of installed capacity and satisfying more than 50 per cent of the energy needed to power Canada's largest economy. With Ontario at the forefront of the energy transition in Canada, the province can be positioned as an energy superpower with a strong foundation of nuclear capacity. Nuclear holds tremendous potential to meet Ontario's growing energy demands, reduce emissions, and create an energy export strategy that positions Ontario as an energy superpower in North America.

As Ontario's own energy needs are increasingly met through nuclear technologies, the province can look beyond its borders and seize the opportunity to export clean energy to neighboring jurisdictions. Ontario is geographically positioned to be a major supplier of electricity to the United States, especially to neighboring states in the northeast and midwest, which are seeking to reduce their carbon emissions and transition to cleaner energy sources.

Energy exports to the U.S. provide an opportunity to create economic growth in Ontario, while also benefiting our regional neighbors. By exporting clean, reliable nuclear power, Ontario can diversify its

economy, strengthen its energy sector, and create high-quality jobs across the nuclear supply chain, including manufacturing, construction, operations, and research and development. The sale of surplus clean energy to the U.S. could also generate significant revenue streams, which can be reinvested in the Ontario economy.

Nuclear energy exports not only contribute to economic activity in Ontario, but also align with the decarbonization goals of the U.S. Northeast and Midwest regions as well as other global jurisdictions. Many of these areas have committed to ambitious emissions reduction targets and are actively seeking alternatives to coal, natural gas, and oil for power generation. Ontario-based nuclear energy is a clean, reliable alternative that can help them meet their own energy goals, while solidifying Ontario's stature as an energy leader.

As part of the IERP and in the interest of establishing a practical reality for Ontario as an energy superpower, the Ministry should prioritize several areas:

1. **Investment in Nuclear Energy Infrastructure**: Ontario must prioritize investment in its nuclear energy infrastructure, including the refurbishment of existing plants, the construction of new reactors, and support for the development of advanced nuclear technologies, including CANDU® MONARK. Nuclear as the backbone of a robust supply mix will ensure that Ontario's power generation remains secure, clean, and competitive.
2. **Energy Export Strategy**: Ontario should develop a comprehensive energy export strategy that capitalizes on its nuclear energy resources. This includes forging sensible agreements with neighboring states and provinces, investing in transmission infrastructure, and participating in regional energy markets. By positioning Ontario as a reliable and clean energy supplier, the province can gain both economic and environmental benefits.
3. **Collaboration with Industry and Innovation Partners**: Ontario must foster collaboration between government, the private sector, and research institutions to drive innovation in nuclear energy. By supporting research and development, Ontario can remain at the forefront of nuclear technology advancements.
4. **Public Engagement and Education**: The success of Ontario's nuclear energy strategy relies on the support of its citizens. Public education campaigns are critical to building trust in nuclear energy. These efforts should focus on transparency, safety, environmental benefits, and the economic opportunities associated with nuclear energy development in Ontario.

BWXT is committed to supporting the Government of Ontario in its efforts to build a sustainable, reliable, and affordable energy future. We look forward to contributing to the realization of this vision and working collaboratively to ensure Ontario's success.