BWXT Canada Ltd.

May 14, 2023

Submitted via Environmental Registry of Ontario (ERO) Posting

RE: ERO Number: 019-6647
IESO Pathways to Decarbonization Study
BWXT Canada Limited Submission

BWXT Canada Limited ("BWXT") appreciates the opportunity to offer our response on the Independent Electricity System Operator's ("IESO") *Pathways to Decarbonization Study* ("P2D" or, the "Pathways Study") recommendations in response to ERO Posting 019-6647.

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 support the development of infrastructure required to meeting Ontario's future electricity supply needs and net-zero objectives.

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. Our Ontario operations are located in Cambridge, Toronto, Arnprior, Peterborough, Port Elgin, Owen Sound, Ottawa, and Oakville. Overall, BWXT employs over 1,500 professionals and skilled tradespeople in Canada and is signatory to four different trade union agreements.

The nuclear industry is the most significant economic component of Ontario's electricity sector, directly and indirectly supporting 76,000 high paying jobs across Canada, with the majority of those located in Ontario. The opportunity for the industry and for the province going forward is significant. The Pathways Report forecasts a need for 17,800 MW of new nuclear generating capacity to achieve Ontario's net-zero goals by 2050 - more than all of Ontario's existing nuclear supply.

To support this long-term objective, BWXT is committed to playing a constructive role in the process of building and maintaining a reliable, affordable, and sustainable system for the benefit of all Ontarians.

To this end, our submission is organized into the following sections:

Value of Refurbishment
Planning is Key to Decarbonization
Streamlining Regulatory Processes
The Need for New Nuclear

I. Value of Refurbishment

The province is on the cusp of a significant new period of energy transformation.

We are already witnessing this with active procurements underway, the ongoing refurbishments at Bruce Power and Ontario Power Generation's ("OPG") Darlington Nuclear Generating Station ("Darlington"), the construction of Canada's first small modular reactor ("SMR"), and the electrification of industry and transportation. 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 growth but also by the currently expected retirement of the Pickering Nuclear Generating Station ("Pickering").

Concurrently, other aging assets in addition to these nuclear units are reaching their end-of-life, compounding the increasing supply-demand disparity. The Pathways Study and documents such as IESO's Annual Planning Outlook ("APO") identify this imminent and growing need, forecasting an approximately 3,000-4,000 MW deficiency to manage by the end of the decade, which could increase to approximately 16,000 MW by 2040 if existing resources are not still available at that time.

BWXT is in favor of a reliable and predictable schedule for nuclear refurbishment at Bruce Power and Darlington to mitigate the near-term effects of this deficit and recommends close collaboration with the nuclear supply chain with respect to any considerations around optimizing that schedule. Likewise, OPG is currently undertaking detailed analysis of the feasibility for life extension of the Pickering "B" units, representing a minimum of 2,100 MW of non-emitting baseload generation which may be able to serve Ontario for another 30 years or longer. Such an infrastructure project, immediately following the successful refurbishment of Darlington's four units, would unlock significant incremental investment and secure valuable generating capacity in one of the fastest growing regions of North America, the Greater Toronto Area ("GTA").

The refurbishments at Bruce Power and Darlington are collectively levering an investment of more than $26 billion and represent two of the largest infrastructure projects in Canada. A study conducted by the Conference Board of Canada concluded that the impact of the Darlington refurbishment and continued operations would contribute an average of 14,200 jobs per year from 2017 to 2055 and deliver $89.9 billion in additional GDP. A similar study conducted by the Canadian Council for Public-Private Partnerships for the Bruce site concluded that during normal operations, Bruce supports 18,000 direct and indirect jobs every year and delivers $4 billion in annual economic benefit.

A Pickering "B" refurbishment would unlock similar economic benefits in Durham Region and across Ontario. Pending OPG's detailed analysis on technical feasibility, IESO should consider the long-term value of maintaining such a magnitude of non-emitting, baseload generation in the East GTA paying attention to the context of electrification and decarbonization, the utility of an existing power generation site with high energy density, and the equivalent footprint of new alternatives to serve demand in Canada's largest population center.

II. Planning is Key to Decarbonization

Ontario's electricity needs are both certain and significant enough for the province to be advancing all avenues that would practically expand the availability of clean energy options to meet these future requirements.

Commencing formal planning and regulatory processes for incremental nuclear generation in Ontario would seize the opportunity to, at minimum, preserve an important option to sustain Ontario's nuclear workforce and the associated economic benefits for generations, address undeniable electricity supply needs with cost-effective, emissions-free power, and reduce long-term ratepayer risk exposure by hedging supply and procurement.

As mentioned, the nuclear industry is the largest and most economically significant component of Ontario's domestic energy sector, and without post-refurbishment investment, thousands of skilled jobs will be irrecoverably lost. Likewise, the energy density of Ontario's existing, licensed nuclear sites are extremely high, have access to high voltage transmission corridors, and may have the capacity to accommodate more supply. With the siting of electricity infrastructure becoming increasingly challenging, existing footprints backed by supportive communities provide opportunities that should be fully considered by IESO when planning for future needs.

For Indigenous communities, creating partnerships prior to engagement is of critical importance, and BWXT deeply values establishing meaningful relationships where we operate. We believe project proponents have a responsibility to engage early and substantially with Indigenous communities and make best efforts to maximize their participation in infrastructure development.

III. Streamlining Regulatory Processes

Ontario's existing nuclear sites can likely accommodate more nuclear generation than exists today, but unlocking those potential options is contingent upon successfully completing an extensive federal regulatory process that can take six or more years to complete. BWXT supports Ontario working with the Government of Canada to assess the practicality of streamlining those regulatory processes, while respecting the importance of Indigenous participation, and establishing reliable cost recovery mechanisms for proponents to fully undertake these regulatory requirements.

Streamlining these processes can help the supply chain support a reduction in potential construction timelines of new build assets, which for nuclear capacity can be extensive. Optimizing the regulatory requirements for existing brownfield nuclear sites is prudent and logically should be differentiated from new, greenfield siting options. Ontario's existing nuclear sites are extensively assessed, regulator observed, audited, and inspected by multiple agencies on a continuous basis. This one-size-fits-all approach serves to delay the development of carbon-displacing electricity infrastructure and therefore is a barrier to Canada meeting its decarbonization objectives.

Although BWXT has the capacity to support new build nuclear projects, our production can be affected by longer project times. The longer it takes to start manufacturing, the higher the risk for our current resource pool of expertise will be lost. Ideally, any new nuclear development which supports Ontario's decarbonization and electrification goals, will be planned end-to-end, and the supply chain engaged closely enough that BWXT will be able to maintain a levelized workforce and the required expertise to support the project efficiently and cost-effectively.

IV. The Need for New Nuclear

According to IESO, supply constraints will start to affect Ontario's electricity system towards within the coming decade. As the province will need resources to come online in a timely manner, future development delays can be mitigated by advancing planning and regulatory processes for large-scale, long-lead time assets such as nuclear. As one of the largest companies in the nuclear supply chain, BWXT values the certainty of projects we will be involved in to be securely supported by provincial policy and a long-term plan. Infrastructure on the scale suggested by the Pathways Study requires a significant commitment of physical and human capital, skills development to ensure the workforce to deliver those projects, and strong alignment between government and the private sector.

Based on the presumed timing, BWXT has the capability to support a new nuclear project, while supporting the ongoing refurbishments, and a prospective Pickering "B" life extension concurrently. To this end, to enable "Made-in-Ontario" initiatives, we need to see support for major investments in capital equipment, as well as federal and provincial tax credits and grants in addition to streamlined regulatory timelines. We believe schedule efficiency can be achieved in the interest of overall project cost-effectiveness by:

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

BWXT would be prepared to make investments to support the necessary capacity and finance the resources required to work towards decarbonization. To do this, the supply chain must have clarity on the specific outcomes the province would like to achieve by way of technology timing, scale and characteristics, as well as line-of-sight broadly into the province's long-term plan for sustainable energy initiatives and a roadmap or timeline for overlapping, multi-project delivery to allow the supply chain to scale resources accordingly.

Ontario's decarbonization strategy should rightly depend on nuclear energy being a foundational resource. It is safe, dependable, non-emitting, and carries incomparable benefits for Ontario both socially and economically compared to all other technology options. BWXT is committed to working collaboratively with our partners across the nuclear industry to support the Government

of Ontario in its efforts to responsibly reduce emissions in our province to combat climate change, and would like to be seen as an ally in this process.

Sincerely,

John MacQuarrie

President, Commercial Operations