

Ms. Rachel Thompson
Senior Policy Advisor
Strategic Network & Agency Policy Division
Ministry of Energy, Northern Development & Mines
77 Grenville Street, 6th Floor
Toronto, Ontario
M7A 2C1

RE: EBR Registry Number 019-3007 - Reviewing Ontario's Long-Term Energy Planning Framework

Dear Ms. Thompson,

On behalf of Ontario's Nuclear Advantage (ONA) I am pleased to submit our comments to the Ministry of Energy, Northern Development & Mines (ENDM) as part of Ontario's ongoing review of the province's long-term energy planning framework. ONA understands that ENDM's goals in reforming the approach to long-term energy planning include promoting openness, accountability, and effectiveness of energy planning decision-making, increasing investment certainty, and ensuring the interests of ratepayers are protected. These principles are important in framing any discussion around a comprehensive plan for the province that endeavours to balance the economic, environmental, reliability and affordability expectations that Ontario families and businesses have for their power system.

Background

Nuclear energy is the backbone of Ontario's electricity system. It represents approximately one-third of the province's installed capacity and satisfies more than 60% of the energy needed to power our hospitals, schools, homes, and businesses below the average cost to produce residential power. It is reliable, cost-effective, and non-emitting, making it a foundational element of modern, resilient electricity systems that drive their economies and enable their sustainability objectives. The role of nuclear power in Canada goes far beyond being a safe, clean, affordable, and reliable source of energy. It has an important role to play in medicine, industry, food safety, research, and innovation, and it supports thousands of long-term, high-tech and well-paid jobs. The nuclear industry's \$17 billion annual contribution to gross domestic product (GDP) and direct support of more than 70,000 jobs in Canadian communities large and small make it the most economically significant presence in Ontario's energy sector, and one of the most significant industrial footprints in the province generally.

Over the past several years, the Independent Electricity System Operator (IESO) has focused substantial efforts on transitioning to the long-term use of competitive mechanisms to meet Ontario's resource adequacy needs through both the holding of seasonal Capacity Auctions and a Resource Adequacy Framework that is currently undergoing stakeholder consultation. These mechanisms are being

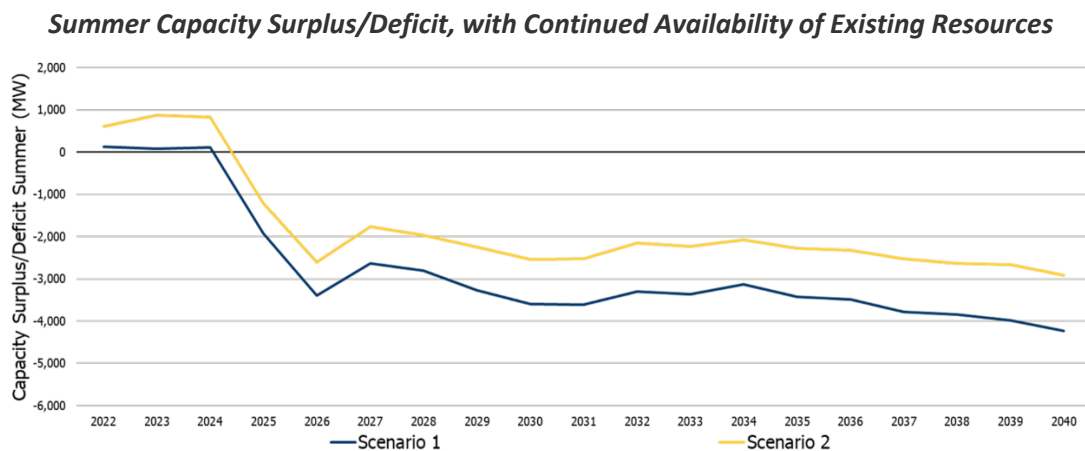
advanced with the objective that competition will ensure that the lowest-cost unit of supply can be enlisted to meet Ontario’s needs when and where they arise. These needs, based upon demand

projections and visibility into supply mix dynamics, are currently forecast in the IESO’s Annual Planning Outlook (APO).

The most recent APO, released in December 2020, contained two demand forecast scenarios based on pandemic-related impacts along with the speed and degree of post-pandemic economic recovery:

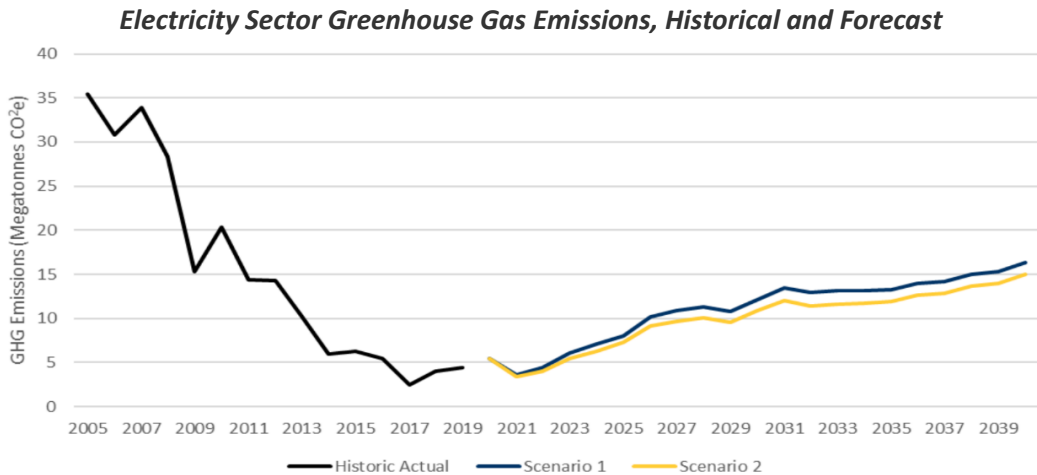
Scenario 1 - Shallow economic recession in 2020 and early 2021, with a small-scale reimplementation of temporary restrictions and business closures in early 2021, followed by an economic recovery accelerating later in 2021 and beyond.

Scenario 2 - Deeper economic recession from 2020 to the end of 2021. Prolonged and significant impacts will be followed by a slow, multi-year economic recovery starting in 2022.



Source: IESO Annual Planning Outlook, December 2020

In both scenarios, Ontario has substantial, permanent looming capacity needs ranging from approximately 2,000-3,000 MW that begin to manifest between 2024-2026 largely related to the loss of supply from the Pickering Nuclear Generating Station (NGS) as units retire. This forecast assumes that all other generation resources currently under contract are available over the planning horizon. With much of that capacity coming from existing natural gas facilities which will be required to operate at higher capacity factors, the expectation notwithstanding incremental supply decisions yet to be determined, is that greenhouse gas (GHG) emissions related to electricity generation will triple within two decades.



Ontario’s successful retirement of all coal-fired electricity generation in the province represented North America’s single largest GHG reduction initiative to date. While several resources played a role in the province’s transition to a coal-free supply mix, increased nuclear output including the return to service of 3,000 MW at the Bruce A station, as well as improved performance and increased output at the Pickering and Darlington stations accounted for nearly 90% of the non-emitting electricity generation required for coal to be completely phased out. The low-emissions system that has been developed in Ontario as a result is in many ways a model for the rest of Canada and the world.

As governments worldwide take steps to satisfy their *Paris Agreement* commitments by reducing GHG emissions, Ontario’s energy planning framework should ensure it maintains its global leadership role by prioritizing non-emitting resources in an economically sound way, while sustainably meeting long-term system needs. Ontario does not necessarily need to choose between lower emissions or lower costs. Nuclear is a foundational part of Ontario achieving its emissions targets, from enabling the electrification of transportation, to supporting a cleaner fuel transition in various industrial sectors including the production of hydrogen, nuclear energy’s non-emitting and reliable profile are uniquely suited to play a greater role in filling these looming needs as required.

However, the asset base required to support an optimal outcome that generates multi-dimensional benefits for the province in addition to clean, reliable and affordable electricity, likely cannot be secured through the competitive and shorter-term mechanisms being discussed as part of the IESO’s ongoing consultations.

Planning a Reliable & Affordable Electricity System

Affordability and confidence in value-for-money has been a top-of-mind issue for Ontario families and businesses for many years when it comes to electricity, and as such an updated energy planning framework should ensure that no option to reliably supply that 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 regional economies, have proved essential to Ontario having the non-emitting power required to sustainably eliminate coal-fired electricity generation, and will be essential to the province being able to lower its emissions in other areas such as transportation and heavy industry.

Ontario's reliable nuclear supply is providing a moderating and stabilizing effect on electricity rates in the province every day. In fact, after legacy hydroelectric stations, Ontario's nuclear fleet provides the most cost-effective contribution to Ontario's electricity supply and effectively insulates Ontario ratepayers from large-scale exposure to volatility in the commodity cost of fossil fuels such as natural gas, like that which was experienced in Texas this past winter, as well as expected future increases to the price of carbon in Canada. As the IESO has forecast in the APO, the current projection notwithstanding future capacity decisions yet to be made, is that this exposure is expected to increase regardless once Ontario retires nearly one-quarter of its current nuclear capacity within just five years.

These foundational elements of a clean, reliable, and affordable electricity system, such as Bruce Power and Niagara Falls, would not be able to be built under the short or even medium-term competitive market designs being consulted upon by the IESO alone. These procurement structures must be developed in conjunction with other mechanisms that can assure stakeholders that a renewed market and long-term planning framework will be able to support and build upon the best elements currently supplying power to Ontario for the coming decades. This includes a comprehensive understanding of incremental opportunities that may exist in enhancing our core nuclear and hydroelectric generating stations to derive additional capabilities through innovative investments and utilizing established infrastructure footprints.

For example, Bruce Power was able to achieve a new site peak output record of 6,400 MW with all eight units in operation due to an additional 100 MW of output gained from more efficient operation and enhanced performance of the non-nuclear components of the plant. This modification alone provided enough incremental energy during the province's winter peak to power a city the size of Kingston. By incorporating an understanding of the long-term cost-benefits of nuclear energy, the potential additional capabilities that may be cost-effectively unlocked, as well as the secondary benefits such as job creation, pricing stability, the health benefits of cleaner air and medical isotope production in long-term planning, it will help ensure optimal outcomes for the supply mix to derive the greatest benefits for the province in meeting the electricity needs of tomorrow.

According to the APO, Ontario will experience a sustained and growing deficiency of capacity throughout the mid-2020 period into the 2030s. As such, capacity resources should be evaluated based

on their cost-efficiency over a short and longer-term. An updated long-term planning framework should include mechanisms to assess the relative value of securing resources including nuclear that could provide value over time, but where that value can only be realized over a multi-year commitment required for licensing, approvals, and development. Restricting this flexibility by relying solely on shorter-term competitive and market processes could limit optimal choices and outcomes for Ontario.

Ensuring Maximum Flexibility

While nuclear has traditionally been relied upon as a stable, predictable baseload resource that contributes valuable energy as well as capacity at all times, it is increasingly observed that nuclear stations in concept and practice can offer a more tailored product for system planners and operators than they traditionally have in the past. Technologies have adapted to present the option of a much greater range of unit sizes for circumstances where incremental scalability is a valuable consideration.

Small Modular Reactors (SMRs) have been a subject of considerable discussion over the past several years, and a number of technologies have commenced licensing processes in Canada as well as other jurisdictions. In fact, just this month as part of an Interprovincial Memorandum of Understanding (MOU) signed in 2019, the Governments of Ontario, Saskatchewan and New Brunswick, supported by Ontario Power Generation, Bruce Power, SaskPower and NB Power released a Feasibility Report entitled *Feasibility of Small Modular Reactor Development & Deployment in Canada*.

Ontario Power Generation is leading along with Bruce Power and SaskPower, a technical/economic down-selection process that is expected to identify a preferred vendor by the end of 2021. In the near future, once a technology has been selected and has progressed to a sufficient stage of development, some manner structure will need to be in place regarding a long-term cost recovery framework which should assess how best to deliver the greatest value to ratepayers and the province over the project lifecycle.

All nuclear stations are manoeuvrable to a certain extent, allowing them to somewhat follow changes in supply availability and demand. This is a concept that is already being employed by Bruce Power, where each of the site's eight units are able to safely reduce their output by 300 MW in times of low demand in the province. Every day, this provides the IESO with 2,400 MW of flexible generation on 30-minutes' notice. The flexibility the Bruce units provide has been achieved through enhancements to operations and physical upgrades on the non-nuclear side of the plant and has been recognized by both the Canadian Nuclear Safety Commission (CNSC), as well as by the World Association of Nuclear Operators (WANO), as an industry-leading, highly innovative practice that is carried out in a safe and predictable manner.

Ontario has recognized that nuclear can provide long-term benefits to the province – in making the decision to pursue ongoing operations at Pickering, refurbish reactors at Darlington and at Bruce Power, and its recent support for Ontario Power Generation's application to the CNSC for a ten-year Nuclear Power Reactor Site Preparation License renewal until 2031 for the Darlington site. A parallel development structure to those being assessed by the IESO for longer-term investments in the Ontario market would address much of the restrictiveness associated with the currently proposed capacity and

resource adequacy frameworks, ensuring that long-term assets are considered in a cost-effective, responsible manner. Most importantly, it would not restrict the resource options available in Ontario's future market, to ensure that long-term value potential is not overlooked in favour of short-term goals.

The uncertainty in longer-term forecast demand coupled with the shorter timelines required for the deployment of SMRs and the large quantities of capacity under contracts that will expire between 2025-2035, much of it GHG-emitting, strongly suggests that Ontario would benefit from the flexibility of not having to repeat a potentially lengthy regulatory undertaking should the need arise to commence development in the nearer-term.

Conclusion

Ontario's electricity system has undergone a significant transformation over the past two decades, and an extended period of supply surplus must soon beget serious consideration of what resources will satisfy the province's increasing needs over the next two decades. A robust, inclusive, and transparent long-term planning framework that is subject to regular updating and stakeholder engagement, reflective of principles that should underpin a modern power system is in the best interest of the province.

These include the cost-effectiveness of energy supply and capacity, transmission and distribution; the reliability of energy supply and capacity, transmission and distribution; the use of cleaner energy sources and innovative and emerging technologies; monitoring GHG emissions and the participation of Indigenous communities in the energy sector. It also includes establishing processes that ensure fair and equal assessment of infrastructure that supplies clean, reliable, low-cost electricity from generating stations that may involve capital investment and lead times to plan, permit, construct and commission that do not align with IESO's short-term, competitive resource adequacy measures.

The absence of such processes limit opportunities for the very kind of multi-generational and most economically impactful resources, like nuclear energy, that serve to moderate electricity prices while keeping emissions low, support growth in a more electricity-dependent clean economy, simultaneously produce life-saving isotopes and create whole careers for thousands of Ontarians.

It is for these reasons that an updated long-term energy planning framework should include a clearly defined parallel mechanism, in addition to the approaches currently contemplated by the IESO, which focuses on evaluating, comparing, and developing a longer-term asset strategy for Ontario's electricity system. This parallel mechanism should serve to increase supply options by fairly weighting longer-term investments and addressing the barriers to development of resources such as nuclear in the currently proposed market system.

ONA appreciates the opportunity to share its perspective with ENDM and would welcome further discussions with staff as Ontario considers refinement of a renewed long-term energy planning process for the province.

Sincerely,

A handwritten signature in black ink, appearing to read "Ron Oberth".

Ron Oberth
Organization of Canadian Nuclear Industries

A handwritten signature in black ink, appearing to read "Bob Walker".

Bob Walker
Canadian Nuclear Workers' Council

A handwritten signature in blue ink, appearing to read "James Scongack".

James Scongack
Bruce Power

A handwritten signature in blue ink, appearing to read "John Gorman".

John Gorman
Canadian Nuclear Association

A handwritten signature in black ink, appearing to read "John MacQuarrie".

John MacQuarrie
BWXT

A handwritten signature in black ink, appearing to read "Darryl Spector".

Darryl Spector
Promotion Nuclear



Ryan Plante
UBC Local 2222



Rob Christie
Lakeside Process Controls Ltd.



Eddie Saab
Westinghouse Electric Canada



Bill Barbosa
LiUNA Ontario Provincial District Council



Canon Bryan
Terrestrial Energy



John D'Angelo
Kinectrics