## IESO Pathways to Decarbonization Study – Enfinite Response Feedback on the report and the IESO’s “no-regret” recommendations.

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## Introduction

Ontario already benefits from one of the cleanest electricity systems in the world, with over 90% of the electricity generated from emissions-free sources in 2021. While fossil fuels still make up a small amount of Ontario’s total supply mix, the majority is a diverse mix of clean resources like nuclear, waterpower, wind, bioenergy and solar.

On October 7, 2021, in response to the Independent Electricity System Operator’s (IESO) “Gas Phase-Out Impact Assessment” study which concluded that the decarbonization of the electricity system by 2030 was not technically or economically feasible, the Minister of Energy asked the IESO to evaluate a moratorium on the procurement of new natural gas-fired generation and develop an achievable pathway to zero emissions in the electricity sector. The IESO has called this report back to the Minister “Pathways to Decarbonization Study”.

In the study, the IESO indicates that a moratorium on new natural gas generation is feasible following the completion of its current long-term procurements, which includes up to 1,500 megawatts (MW) of new natural gas capacity to meet supply needs in the mid-2020s. The moratorium assessment shows that most of the projected Ontario demand in 2035 can be met with the build out of non-emitting sources, but some natural gas will still be required post-2035 to address local needs and provide the services necessary to operate the system reliably.

The IESO also considered the pathway to a zero-emissions electricity system under a scenario with a high demand forecast and emitting generation constraints informed by the proposed federal Clean Electricity Regulation. The pathway assessment illustrates a system designed to meet projected demand peaks almost three times the size of today by 2050. To achieve this, the pathways assessment includes 69,000 megawatts of non-emitting supply and 5,000 megawatts of conservation efforts, at an estimated capital cost of $375 billion to $425 billion, in addition to the current system and committed procurements.

While the moratorium and pathways assessments are not power system plans, the assessments provide insights into potential opportunities and challenges that Ontario faces in addressing future electricity system planning.

The Ministry of Energy is working strategically with its energy agencies and partners to ensure the building blocks are in place for an integrated energy plan that meets Ontario’s energy needs and while maintaining reliability and our clean energy advantage, at the lowest cost to families and businesses. Critical initiatives, such as the IESO’s Pathways to Decarbonization Study and the Minister’s Electrification and Energy Transition Panel (the Panel), will help to inform the government’s next steps towards its longer-term vision for an integrated energy system.

The Panel has been tasked with advising government on the highest value short, - medium- and long-term opportunities for the energy sector to help Ontario’s economy prepare for electrification and the energy transition. The Panel is developing advice on how Ontario’s energy policy and planning apparatus can foster efficient co-ordination across the energy sector. This advice will inform government as it looks to develop a future integrated energy plan. This future integrated energy plan will incorporate input from Ontario families and businesses, stakeholder groups and Indigenous communities.

## The IESO’s Report Recommendations

The IESO’s report provides “no-regret” recommendations that reflect the scope and magnitude of the effort needed to support an orderly energy transition while maintaining a reliable and affordable electricity system for Ontarians.

These recommendations from the IESO include:

* The acceleration of current efforts to acquire new non-emitting supply, including the implementation of recent conservation and demand management directives.
* Beginning the planning and siting work for new nuclear, long-duration storage and waterpower facilities, as well as transmission infrastructure, to allow for faster implementation.
* Innovation and investment in low carbon fuels, such as clean hydrogen, as they are untested at scale. Further work and investment are needed to determine if they can replace some of the flexibility that natural gas currently provides the system.
* Galvanizing collaboration amongst stakeholders, including Indigenous communities.
* Ensuring that regulatory, approval and permitting processes are ready to manage future investment at scale.
* Establishing an open, transparent and traceable process to measure progress and demonstrate the results of decisions and actions taken along the way.

## Request for Feedback

The Ministry of Energy is seeking feedback on the report and, in particular, the IESO’s “no-regret” recommendations. We are particularly interested in comments and responses on the following questions:

|  | **Questions** | **Stakeholder Comments** |
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| 1 | The IESO’s Pathways Study recommends streamlining regulatory, approval and permitting processes, citing that it can take five to 10 years to site new clean generation and transmission infrastructure.  What are your thoughts on the appropriate regulatory requirements to achieve accelerated infrastructure buildout? Do you have specific ideas on how to streamline these processes? | Enfinite thanks the Ministry of Energy for the opportunity to submit comments on this very significant matter. Enfinite is the largest battery storage operator currently active in Alberta, and has recently submitted under the expedited LT1-RFP process. Additionally, Enfinite intends to participate within the upcoming LT1-RFP procurement process and is optimistic regarding the opportunities being presented by the Province of Ontario and the IESO.  As a leader in energy storage, Enfinite is supportive of the intended scenarios and analysis that the IESO has identified, particularly in terms of energy storage and decarbonization. Expediting regulatory processes will require submissions from municipal governments and transmission & distribution entities, to create a process that considers the requirements of these parties to achieve quicker asset commissioning.  Expediting timelines for regulatory, permitting, and other approvals will be essential in enabling new clean technologies to achieve net-zero. |
| 2 | The IESO’s Pathways Study recommends beginning work on planning and siting for new resources like new long-lived energy storage (e.g., pump storage), nuclear generation and waterpower facilities.  What are your expectations for early engagement and public or Indigenous consultations regarding the planning and siting of new generation and storage facilities? | Streamlined regulatory processes require early engagement, particularly with affected communities and Indigenous groups.  It is essential to provide early opportunities for meaningful public and Indigenous consultations in the planning and siting of new generation and storage facilities. Engaging these stakeholders from the outset allows for the incorporation of diverse perspectives, identification of potential concerns, and the development of mutually beneficial solutions.  As one of the largest battery storage operators in the country, Enfinite would welcome the opportunity to be a part of these initial public consultations to offer valuable insights on planning and storage facilities. |
| 3 | The IESO’s Pathways Study shows that natural gas-fired generation will need to continue to play an important role in the system for reliability in the short to medium term. The IESO’s assessment shows that most of the projected Ontario demand in 2035 can be met with the build out of non-emitting sources, but some natural gas will still be required to address local needs and provide the services necessary to operate the system reliably.  Do you believe additional investment in clean energy resources should be made in the short term to reduce the energy production of natural gas plants, even if this will increase costs to the electricity system and ratepayers? What are your expectations for the total cost of energy to customers (i.e., electricity and other fuels) as a result of electrification and fuel switching? | Enfinite understands that with the decarbonization of the grid, the costs associated with grid transformation are ultimately paid by the ratepayers. A significant challenge in achieving net-zero by 2035 is the potential costs to transition the grid that maintains resiliency and reliability. While natural gas generation remains important to the reliability and resiliency of the grid, additional investments in clean energy resources, including energy storage, should be initiated in the short term given certain supply chain shortages and demand for energy storage from other jurisdictions.  Energy storage is incredibly versatile and plays a critical role on the pathway to net-zero — therefore warranting significant investment from the Government of Ontario. Enfinite believes that decarbonization of the grid in Ontario is not possible without energy storage playing a role in supporting grid transition due to the unique capabilities of utility-scale storage. Its flexibility in switching between load and supply, potential portability, and the variety of competitive services energy storage supplies makes it an essential component of decarbonization. Without the ability to store energy from products such as solar and wind, the issue of diminishing dispatchable generation will increase intermittency issues.  However, Enfinite would like to reiterate that this transition needs to be affordable, and the Government of Ontario will need to consider how to support the public and system costs. Allowing battery storage facilities the flexibility of being utilized as both a reliability service and operating in the market would bring investor confidence into this emerging market, help meet net-zero demands, further strengthen reliability of the grid, alleviate the regulatory burden, and reduce infrastructure inefficiencies that may result in increased ratepayers costs. |
| 4 | The IESO’s Pathways Study highlights emerging investment needs in new electricity infrastructure due to increasing electricity demand over the outlook of the study. The IESO pathway assessment illustrates a system designed to meet projected demand peaks almost three times the size of today by 2050, at an estimated capital cost of $375 billion to $425 billion, in addition to the current system and committed procurements. Please see supporting materials for illustrative charts on capacity factor and cost by resource type.  Are you concerned with potential cost impacts associated with the investments needed? Do you have any specific ideas on how to reduce costs of new clean electricity infrastructure? | There are concerns about potential cost impacts associated with the investments needed, however, energy storage can decrease  these costs to deliver a significant, cost-effective impact on decarbonization.  Storage can provide support to transmission services at a much lower cost, shorter timespan for implementation, and have less environmental impact than that of traditional transmission builds. Storage is a vital component in enabling renewable energy on a larger scale, playing an essential role in balancing electricity supply and demand. It can also maintain reliability in a cost-effective manner, bridging sustainability with economic development.  Climate modeling and energy system assessment studies have shown that an electricity sector with net-zero emissions, and an increasing share of electricity in the end-use fuel mix, is a cornerstone of an energy system in a carbon neutral world. The most economical way to achieve this is the pairing of renewables with energy storage.  \***Relevant study here:**  [**https://news.mit.edu/2022/energy-storage-important-creating-affordable-reliable-deeply-decarbonized-electricity-systems-0516**](https://news.mit.edu/2022/energy-storage-important-creating-affordable-reliable-deeply-decarbonized-electricity-systems-0516) |
| 5 | The IESO’s Pathways Study recommends that for a zero-emissions grid by 2050, investment and innovation in hydrogen (or other low-carbon fuels) capacity could be required to replace the flexibility that natural gas currently provides the electricity system.  Do you have any comments or concerns regarding the development and adoption of hydrogen or other low-carbon fuels for use in electricity generation? What are your thoughts on balancing the need for investments in these emerging technologies and potential cost increases for electricity consumers? | Pairing hydrogen and other low-carbon fuels with innovative energy storage solutions will optimize generation and decrease costs. Energy storage is a socially responsible, operationally reliable and an economically sound solution that benefits the grid and ratepayers. The development of alternative low-carbon fuels provides additional resources available to support the decarbonization of the grid.  The development of hydrogen and alternative low carbon fuels need to support the decarbonization targets throughout the entire life cycle. Developing an energy-storage enabled green hydrogen supply chain should be the focus. This is critical in supporting Ontario’s net-zero targets. |
| 8 | The IESO’s Pathways Study suggest that significant transmission capacity will be needed to help balance intermittent sources of electricity (e.g., wind and solar) and to ensure cost-effective supply can be delivered to meet growing demands from electrification and economic growth.  Transmission will also be required to balance intermittent supply with dispatchable supply (such as natural gas and energy storage) and meet demand in regions with retiring assets.  What steps should be taken to ensure that transmission corridors can be preserved and lines can be built as quickly and cost effectively as possible? | Several steps can be taken:   * Regulatory framework: Establish a clear and efficient regulatory framework that streamlines the permitting and approval process for transmission projects, while ensuring that environmental and social concerns are addressed. Involving key stakeholders in the natural gas and energy storage sector early in the process could mitigate any unintended challenges. * Technological advancements: Energy storage can be considered as an alternative support to address constraint and oversizing infrastructure for infrequent peaks that may occur with the additional non-dispatchable generation that is replacing dispatchable generation. Additional, investment in and adoption of innovative technologies and construction techniques can reduce the cost and environmental impact of transmission projects, while improving their efficiency and reliability. For example, using high-capacity conductors, advanced materials, and digital monitoring systems. * Financing: Develop appropriate and attractive financing mechanisms, including public and private partnerships, to attract investment and ensure the timely construction of transmission infrastructure. |
| ***9*** | Do you have any additional feedback on the IESO’s “no-regret” recommendations? | As an incredibly versatile and effective solution in decarbonizing energy grids, Enfinite is pleased to see storage incorporated into the IESO’s “no-regret” recommendations and is supportive of the recommendations being tabled by the IESO.  Energy storage is pivotal to securing a net-zero future in Ontario. Innovative energy storage solutions bring greater dependability, viability, and sustainability to the power grid and its stakeholders, while supporting a cost-effective transition from fossil fuels to renewables.  In summary, and as stated above, electricity plays a key role in the path to net-zero and storage is essential to this becoming a reality. Without storage there will not be opportunities for growth in the renewable energy space. These technologies need significant investment and energization now to ensure reliability of the grid in a cost effective, net-zero enabling and streamlined way. Wind and solar energy accounted for 52% of all new electricity generation capacity built in Canada between 2010 and 2018. These trends are likely due to continue, but the reliability of this clean energy is dependent on energy storage. |