

ERO POSTING QUESTIONS

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?

Atlantic Power already holds existing sites and permits for its gas and biomass facilities. Given their location, they are currently substantially underutilized. However, looking ahead to an electrified economy and decarbonized grid, and especially given the vast infrastructure needs of our future system, it makes sense to maintain and expand on existing resources as a priority, to unlock their potential and value to ratepayers, before building new facilities.

To this end, Northern Ontario has tremendous potential, and the province should consider how to unlock these assets to enable them to better contribute to provincial needs, including the permitting and approval of new transmission capacity to support existing and new generation capacity in Northern Ontario. This would alleviate pressure to permit new and existing resources which, especially for new natural gas facilities in today's permitting environment, could be prohibitive from a cost, timing, and public acceptance perspective.

2. The IESO's Pathways Study recommends beginning 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?

The development of these long lead time assets is important, but not without risk. It is for this reason we recommend to not close the door to continued operations of gas and biomass assets in the meantime, as they will continue to provide the long duration capacity and energy the province will need to enable increased electrification and ensure continued grid reliability.

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) because of electrification and fuel switching?

The IESO's report indicates the need for nearly 8,000MW of continued natural gas in 2035, compared with 10,500MW, plus the additional 1,500 currently under procurement, that we will have on the system by 2027. To quote the IESO's P2D Report:

"If the ["Clean Electricity Regulation"] CER were to define the [end of potential life] EOPL as 25 years, then Ontario would only have approximately 2,000 MW of natural gas available; most existing facilities will reach the 25-year mark on or before 2035...This would be insufficient to maintain reliability." (page 27, Appendix B)

The IESO's P2D report therefore correctly asserts there is limited ability for Ontario to comply should such a policy be adopted. Instead, the report assumes facilities continue to operate through an undefined EOPL, which varies according to contract expiry dates.

Atlantic Power would further argue that system reliability and asset value will need to be assessed based on the local circumstances at the time of contract expiry, with a mind to prioritizing ratepayer value and emissions reductions over the long term rather than short term decisions that will compromise reliability and raise prices. For example, maintaining fully depreciated existing assets already paid for by Ontario rate-payers, even for backup reliability needs, may be more economical than building new non-emitting capacity to do the same. This bridge will allow more time for new technologies to undergo price reductions and become more viable for adoption on a larger scale.

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?

Electricity prices have long been a contentious issue in the province, and the added pressures of decarbonization will only exacerbate this challenge. It will be exceptionally important to make these decisions based not only on emissions objectives, but also to time them around other critical factors, such as supply chain, new technology's availability, pricing and operability, as well as the locational considerations specific to Ontario's grid. Taking this informed, long term view will help manage price risk and volatility for ratepayers while still meeting Ontario's longer term decarbonization objectives.

Leveraging incumbent firm, reliable, and fully depreciated natural gas-fired plant can play a critical role in ensuring system reliability and minimizing rate-payer costs as the P2D takes place. Incumbent gas-fired plants running at lower capacity factors but providing a firm flexible capacity

product, can serve to both reduce system emissions and support to the addition of new intermittent generation resources.

In addition to providing required and affordable capacity during the energy transition, natural gas-fired plants are able to reliably respond to market signals and inject energy to the grid as needed. We believe gas plants are a necessity for a smooth transition towards a zero-emissions grid in 2050.

Leveraging existing firm and reliable non-emitting assets should be part of the solution:

Biomass can provide long-term and sustainable renewal energy. While the P2D assumes biomass plants to be around until 2050; There are currently no feasible long-term procurement process in place to ensure their continued operation into the next decade (i.e. Calstock Power's current PPA ends in 2027). Providing those plants with a longer runway would permit them to amortize capital projects over a longer-term and benefits the ratepayers. Also, this would ensure the other economic benefits are secure for the province, including support for the forestry industry and northern development.

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?

The production, storage and transportation of green hydrogen at a scale necessary to replace gas-fired generation on Ontario's system presents significant technological, financial and logistical challenges. Wide scale use of hydrogen as a replacement for natural gas may not be feasible for decades. The use of existing gas-fired capacity, operating at decreasing capacity factors over time as new non-emitting resources are added, may be a more economical way of reducing system emissions until hydrogen's economic and technological challenges are overcome.

Atlantic Power also investigated the feasibility of hydrogen and other technologies at our Calstock biomass facility at the time of our recent re-contracting. At the time, it was determined that there was really no other economical solution at Calstock that would prove lower cost than the existing fuel types. In some cases, such as hydrogen, fuel availability was also a challenge.

6. The IESO's Pathways Study recommends greater investment in new non-emitting supply, including energy efficiency programs.

Following the end of the current 2021-2024 energy efficiency framework how could energy efficiency programs be enhanced to help meet electricity system needs and how should this programming be targeted to better address changing system needs as Ontario's demand forecast and electrification levels grow?

N/A

7. The IESO's Pathways Study includes a scenario for over 650 MW of new large hydroelectric capacity to meet system needs in 2050.

A recently released assessment estimates that there may be potential to develop 3,000 to 4,000 megawatts of new hydroelectric generation capacity in northern Ontario and 1,000 megawatts in southern Ontario.

What are your thoughts on the potential for development of new hydroelectric generation in Ontario by private-, Indigenous- and government-owned developers?

While the capital costs for hydroelectric generation may be higher than nuclear, wind, solar, and natural gas, do you support investing in large scale hydroelectric assets that may operate for over a hundred years?

N/A

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?

Permitting timelines and development difficulties represent a major obstacle to the development of new generation resources in the greater Toronto and other congested areas. To achieve 2050 objectives and support system reliability as nuclear and other generation units retire, government should expedite the permitting and approval processes necessary to ensure that new and existing generation in the north and other transmission constrained areas can be developed and maintained to meet Ontario's projected capacity needs.

9. Do you have any additional feedback on the IESO's "no-regret" recommendations?

Everyone agrees that Ontario is facing a shortfall of capacity in a not so distant future. Let's not regret letting existing assets go away and have the ratepayers stomach the cost of building new plants to replace the lost MWs. New projects are still going to be required to cover the increased electricity demand in Ontario in the next decades.

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