

March 15, 2024

Submitted to Environment and Climate Change Canada (ECCC)

By email to: [ECD-DEC@ec.gc.ca](mailto:ECD-DEC@ec.gc.ca)

Re: Independent Electricity System Operator (IESO) Submission on ECCC's *Clean Electricity Regulations* (CER): Public Update.

## Executive Summary

The IESO is encouraged by the changes to the provisions of the draft CER currently being considered by ECCC, as described in ECCC's public update report dated February 16, 2024 ([Update Report](#)). While these changes have the potential to address the IESO's concerns on the draft CER as raised in its [November 2, 2023 submission](#) (November 2 Submission), they remain conceptual and lack the specific detail necessary for the IESO to assess their effectiveness in meeting Ontario's needs.

The IESO recognizes that ECCC issued the Update Report to obtain feedback on the changes under consideration prior to finalizing the CER. To assist ECCC, this submission provides the IESO's perspective on 1.) the merits of the proposed changes to the provisions of the draft CER, and 2.) guidance on the values to which the undefined elements of each provision must be set to allow Ontario to comply with the final CER in a manner that does not introduce significant reliability and economic risks. The IESO also recommends that ECCC publish a follow-on report, prior to publication of the final CER in Gazette 2, that proposes revised CER language for each of the conceptual changes considered in the Update Report for public comment, as further described below.

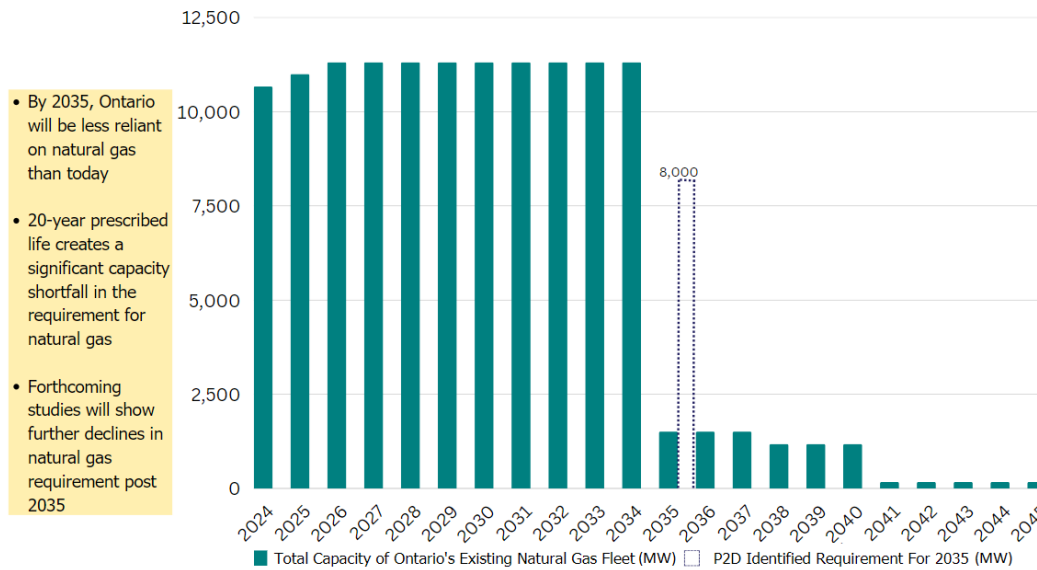
The IESO looks forward to meeting with ECCC to further discuss Ontario's needs and its perspectives provided herein.

## Response to the Update Report

The November 2 Submission indicated that Ontario could not comply with the draft CER without putting the reliability of the provincial electricity system, electrification of the broader economy and economic growth at significant risk. The IESO's position was predicated, in part, on its finding that the draft CER would create a resource shortfall resulting from the severe restrictions it would impose on natural gas generation. Figure 1, originally presented in the November 2 Submission, illustrated the IESO's concerns. In particular, Figure 1 illustrates the significant capacity deficit resulting from the proposed start date of the draft CER's emissions

restrictions, based on a 20-year end of prescribed life, compared with the natural gas capacity that is expected to be required in 2035, as identified by the IESO's [Pathways to Decarbonization study](#) (P2D)<sup>1</sup>. The IESO further explained that the resource shortfall could not be resolved through the addition of incremental non-emitting resources as there was insufficient time to plan, acquire and build the new generation and transmission infrastructure necessary to replace the natural gas generation that would be affected by the provisions of the draft CER.

**Figure 1: Resource Shortfall Created by the CER and 20-year Prescribed Life**



The November 2 Submission also identified that other provisions of the draft CER, namely the Emergencies and Peaker provisions, would create significant impediments to the IESO's ability to operate Ontario's electricity system and would necessitate revision to remedy the significant risks they would produce.

The November 2 Submission recommended that ECCC amend the provisions of the draft CER in the following ways to address the IESO's concerns:

1. Extend the end of prescribed life (EoPL) for existing units from 20 to 30 years to ensure Ontario has a realistic timeline to replace the natural gas generation that would otherwise be restricted by the provisions of the CER in 2035.
2. Revise the emergencies provisions, to the extent they are necessary, to recognize the realities of real-time power system operations and provide confidence that natural gas generation can be relied upon for public safety, by adopting the NERC definition for an Energy Emergency (as further described in Appendix A).
3. Reconsider the exception for emissions from 450 annual operating hours to ensure the electricity system can continue to rely on natural gas generators for essential reliability services.<sup>2</sup>

<sup>1</sup> IESO Pathways to Decarbonization Study, p. 37.

<sup>2</sup> Essential reliability services as described at Appendix A of the November 2 Submission.

The IESO also remains concerned by the realistic probability that the CER could negatively impact local reliability if the transmission reinforcements necessary to replace the supply currently provided by local natural gas plants cannot be built prior to these facilities reaching their EoPL (regardless of the EoPL being set at 30 years). Beyond the recommendations in the November 2 Submission, the IESO requests that ECCC consider including a provision in the CER that would enable local natural gas plants to continue to operate past their EoPL to serve local reliability needs, provided the transmission reinforcements to replace these units have reached a prescribed level of development prior to the CER coming into effect.

The IESO confirms that it is directionally supportive of the contemplated changes to the provisions of the draft CER in the Update Report, and views them as a positive development. However, as these changes are described at the conceptual level only, uncertainty exists with respect to whether and how they will be implemented. Further, key elements of these potential changes remain undefined, preventing the IESO from determining their efficacy in addressing the aforementioned concerns. For these reasons, the IESO cannot with complete confidence state that the conceptual changes in the Update Report will address its concerns identified in the November 2 Submission.

Prior to the publication of the final CER in Gazette 2, the IESO recommends that ECCC publish a follow-on report for public comment that includes more detail on the amendments being proposed, including specific language and values to which the undefined elements of the provisions included in the Update Report will be set. The IESO sees benefit in providing interested parties with an opportunity to assess the effect of the proposed revisions on their respective electricity systems.

### **Specific Feedback on Changes Being Considered**

The IESO wishes to acknowledge its appreciation for the proposals in the Update Report, many of which represent the basis for viable solutions to the IESO's concerns. Specifically, although not contemplated by the Update Report, further revisions that establish a system-wide annual emissions intensity limit based on total production or demand would provide the most flexibility to enable a cost-effective transition, mitigating reliability risks and enabling electrification. Within the context of the proposed framework outlined in the Update Report, allowance for system-wide emissions limit pooling and further refinement of the Emergencies provision could allow Ontario electricity sector participants to comply, provided the undefined elements of these provisions are set to necessary levels and local reliability issues are adequately considered. The IESO looks forward to meeting with ECCC to further discuss its perspective in this regard prior to ECCC's publication of the final CER in Gazette 2.

In the event a solution predicated on the IESO's preferred approach as described in the preceding paragraph is not feasible, for ECCC's consideration, Tables 1 and 2 provide the IESO's perspective on the discrete changes it would request be made to the provisions of the draft CER contemplated by the Update Report. Table 1 identifies the further amendments to the provisions the IESO has determined would be necessary for electricity sector participants to

comply with the final CER in a manner that does not introduce significant reliability and economic risks. Table 2 provides the IESO’s perspective on how the contemplated changes to the remaining provisions could be revised to further assist Ontario meet the challenge of reaching compliance with the CER.

Importantly, the proposed amendments described in Tables 1 and 2 are interconnected, meaning a change to one provision has the potential to offset the need for an amendment to another. As an example, should ECCC extend the EoPL to 30 years, the importance of the IESO’s identified amendments to the peaker provision would be expected to reduce, and vice versa.

**Table 1: IESO’s Requested Amendments to the Provisions of the draft CER**

<b>Change Being Considered</b>	<b>IESO Feedback</b>
<b>EoPL for Existing Units</b>	<ul style="list-style-type: none"> <li>• The IESO recommends that the current “EoPL for Existing Units” provision be extended from 20 to 30 years to ensure Ontario has a realistic timeline to replace the natural gas generation that would otherwise be restricted by the provisions of the CER in 2035. Ontario built the majority of its natural gas generators in the late 2000s as part of its leading efforts to remove coal from its resource fleet. The 20-year end of prescribed life provision would severely restrict the use of these natural gas generators in 2035, creating reliability risks.</li> <li>• For the same reason, extending the EOPL to 25 years would be insufficient for Ontario, as described in the November 2 Submission. A 30-year EoPL is necessary to avoid the creation of an unmitigable resource shortfall in 2035.</li> <li>• Note: the IESO plans for Ontario to reach a net-zero electricity system by 2050, under any EoPL scenario.</li> </ul>
<b>Emergencies</b>	<ul style="list-style-type: none"> <li>• The revised approach under consideration represents a significant improvement, however, the IESO looks forward to working with ECCC on the provision’s final wording, which must recognize the tools available to system operators in different timeframes. In particular, the IESO notes that the final provision should provide an exemption not only when the system operator has declared an emergency, but when the system operator takes action to avoid an emergency, including when it declares a high-risk operating state. In addition, the exemption should apply for the duration of the potential emergency or emergency, as declared by the system operator, and should not be subject to Ministerial review or approval. Included in this, a generator should be exempt from committing an offence for the duration of the potential emergency or emergency, as this could otherwise impact a generator's compliance with system operator direction and impact reliability. Further details on the IESO’s perspective on the Emergencies provision are provided in</li> </ul>

	<p>Appendix A.</p> <ul style="list-style-type: none"> <li>As indicated, the IESO anticipates that its recommended amendments to the Emergencies and pooling provisions could provide Ontario with the needed flexibility to comply with the final CER.</li> </ul>
<p><b>Peaker Provisions</b></p>	<ul style="list-style-type: none"> <li>Although the replacement of the peaker provision with a unit-specific annual emissions limit is an improvement, the IESO’s preference is that a system-wide annual emissions intensity limit be established to regulate emissions. For this reason, the IESO does not support the change to the peaker provision currently under consideration. <ul style="list-style-type: none"> <li>The change from a fixed 450 hours of annual operation to an annual emissions limit that is unique to each unit’s capacity maintains the perverse incentive associated with the draft CER to maintain more gas capacity than is needed to generate the necessary amount of electricity to maintain reliability, resulting in higher costs and a slowing of gas plant retirements post EoPL.</li> </ul> </li> <li>The IESO recommends that the current “peaker provisions” be replaced with a mechanism that instead limits the system-wide emissions intensity of the entire electricity sector within provincial jurisdiction. The revised “peaker provisions” approach described in the Update Report still requires a larger amount of installed capacity to be maintained at higher cost than a mechanism that is based on an annual system-wide emissions intensity (t/gigawatt hour (GWh) of total demand or total generation). An annual system-wide emissions intensity approach would enable gas plants to be phased out in a more cost-effective manner, allowing the IESO to plan for the right level of capacity for the same level of production. This would avoid incurring unnecessarily high fixed costs associated with maintaining more gas capacity than is necessary to produce the same level of energy production. It could also facilitate the operation of natural gas generation based on factors such as location, cost and emissions intensity. This can reduce electricity sector emissions while avoiding unintended outcomes that would be expected to occur under the draft CER, by enabling Ontario to retire less efficient and higher cost plants sooner.</li> <li>Regulating system-wide emissions intensity links the emissions reduction objective (i.e., to lower emissions per unit of electricity) directly to the limit (t CO2 per GWh of electricity) and provides electricity system planners the ability to develop the most effective decarbonization plans.</li> <li>A theoretical example of the benefits of an annual system-wide emissions intensity approach is provided to further illustrate the IESO’s perspective: <ul style="list-style-type: none"> <li>Under ECCC’s proposal, if an efficient plant reaches its emissions limit, then a less efficient plant must be dispatched while the more efficient plant sits idle. Under a construct where the system must be managed to operate under an annual system-wide emissions limit, emissions credits are theoretically pooled, allowing the more efficient plant to operate by using the less efficient plant’s credits.</li> </ul> </li> </ul>

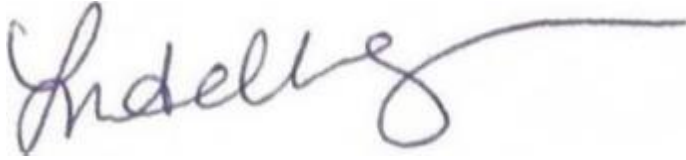
	<p>This construct is akin to Ontario’s existing electricity market which achieves economic efficiencies by prioritizing the dispatch of least cost resources.</p> <ul style="list-style-type: none"> <li>○ If the metric is based on installed capacity, it is probable that installed capacity would need to be maintained to ensure the necessary credits existed to keep gas plants open, whether or not their capacity was required. If the metric was based on an annual system-wide intensity, as proposed by the IESO, then less-efficient plants could be retired (more conducive to emissions reductions since less efficient plants can be closed and more efficient resources operated) and costs reduced since the number of gas plants that would remain open and require payment is reduced. Further, more efficient plants, in addition to having lower emissions, also have lower production costs since their higher efficiency leads to lower fuel costs.</li> <li>● While the IESO views its recommendation that a mechanism that limits system-wide emissions intensity represents the optimal technical approach to regulating emissions in the context of the CER, the IESO recognizes the challenges inherent in its implementation. In particular, the IESO has considered issues around assignment of responsibility for monitoring and accountability for adhering to the performance standard, and looks forward to further exploring these considerations with ECCC during future discussions.</li> </ul>
<p><b>Emissions limit</b></p>	<ul style="list-style-type: none"> <li>● A unit-specific annual emissions limit is not recommended as this could create unintended barriers to reliably supply increased loads resulting from sector electrification and economy-wide decarbonization as a result of the restrictions that would be placed on otherwise available supply. The IESO’s recommended emissions intensity limit allows for electricity demand to grow as the energy transition progresses with increasing electrification.</li> <li>● The IESO is supportive of system-wide pooling at the provincial level, rather than by individual asset owners.</li> <li>● The approach allows for the efficient selection and operation of generators (i.e., it enables the utilization of high efficiency newer units, and the retirement of older, less efficient units). Further, and as described above, regulating to an annual system-wide emissions intensity limit allows electricity system planners the ability to develop the most effective decarbonization plans.</li> <li>● The concept of “entity pooling” is not viable for Ontario as, while the majority of gas plants are owned by a single operator (Atura Power), several independently owned and operated gas plants exist. For this reason, the IESO recommends that ECCC establish an allowance for pooling at the system-wide level. This approach promotes maximum cost efficiencies and emissions reductions by allowing the IESO the flexibility to operate the most efficient plants.</li> </ul>

	<ul style="list-style-type: none"> <li>As indicated, the IESO anticipates that its recommended amendments to the Emergencies and pooling provisions could provide Ontario with the needed flexibility to comply with the final CER.</li> </ul>
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**Table 2: IESO Comments on Remaining Provisions Under Change Consideration**

<b>Change Being Considered</b>	<b>IESO Feedback</b>
<b>Performance Standard</b>	<ul style="list-style-type: none"> <li>While an improvement, the transition to a unit-specific annual emissions limit is not expected to fully address Ontario's needs.</li> <li>If the IESO's recommended annual system-wide emissions intensity approach is adopted, the results of the IESO's planning analysis indicate that Ontario's emission intensity cap should be set at 80 t CO<sub>2</sub>/GWh of electricity production in 2035, declining by 5.7 t CO<sub>2</sub>/GWh annually until 2050. However, this cap is provided for information only and requires further analysis.</li> <li>Appendix B provides additional information on the IESO's emissions projection based on development of the new non-emitting resources as identified in the Ontario government's report entitled "<a href="#">Powering Ontario's Growth: Ontario's Plan for a Clean Energy Future</a>" (POG), a 30-year EoPL and a 450 hours of annual operation peaker provision.</li> </ul>
<b>Pooling</b>	<ul style="list-style-type: none"> <li>As further described in the IESO's comments on the "Emissions Limit" provision, the IESO recommends system-wide pooling within a province, rather than by individual asset owners. This approach has the potential to lessen IESO concerns related to emissions limits and the impacts of the CER on local reliability after EoPL.</li> </ul>
<b>Offsets</b>	<ul style="list-style-type: none"> <li>The IESO sees potential value in this change and would like to further explore the concept with ECCC.</li> </ul>
<b>New Units Under Development</b>	<ul style="list-style-type: none"> <li>Ontario's plants reach their EoPL earlier than other provinces because the province was an early mover in the phase-out of coal fired generation. This fact penalizes Ontario.</li> <li>The IESO would like to explore options with ECCC that would eliminate penalties resultant from Ontario's early-mover status.</li> <li>The IESO would also like to ensure that the "new units under development" proposal in the Update Report would apply to facilities secured by the IESO in its most recently completed procurements.</li> </ul>
<b>Cogeneration Units</b>	<ul style="list-style-type: none"> <li>The IESO has no feedback on this provision.</li> </ul>
<b>Minimum Size Threshold</b>	<ul style="list-style-type: none"> <li>The IESO supports the change to the provision contemplated by the Update Report.</li> </ul>

Sincerely,

A handwritten signature in blue ink, appearing to read "Lesley Gallinger", with a long horizontal flourish extending to the right.

Lesley Gallinger  
President and Chief Executive Officer  
Independent Electricity System Operator



## Appendix A: IESO Perspectives on the Emergencies provision

This Appendix provides additional context on the IESO’s perspectives on the Emergencies provision.

### Guiding Principle:

Electricity is an essential service. Interruptions to supply are a public safety issue. The CER must consider this and allow for emitting supply to run when needed for reliability.

### Real-Time Emergencies:

Emergency conditions can materialize in real-time without warning. To maintain the reliability of the bulk system, System Operators must have sufficient authority to take action in real-time, without a need to seek outside approval.

For NERC-registered entities, emergency conditions and obligations are outlined in mandatory standards.

NERC defines an **emergency** as *"any abnormal system condition that requires automatic or immediate manual action to prevent or limit the failure of transmission facilities or generation supply that could adversely affect the reliability of the Bulk Electric System."*

NERC defines **energy emergency** as *"A condition when a Load-Serving Entity or Balancing Authority has exhausted all other resource options and can no longer meet its expected Load obligations."*

In Ontario, NERC’s standards and definitions are operationalized through Market Manual 7.1. Our defined emergencies are outlined in Table 1 of the Appendix.

**Appendix Table 1: IESO Defined Emergencies**

Type	Description
<i>Energy</i>	When the IESO has exhausted all options and can no longer provide the expected energy requirements of the Ontario Balancing Authority area.
<i>Capacity</i>	When the operating capacity of the Ontario Balancing Authority area – plus purchases from other systems (to the extent available or limited by transfer capability) – is not adequate to meet Ontario demand plus regulating requirements.
<i>Security</i>	When the Interconnected Grid: <ul style="list-style-type: none"><li>• Is in an unstudied operating state, where for example there was an equipment failure that resulted in a system configuration for which limits were not derived (e.g., a stuck breaker), or</li><li>• Has a limit exceedance (e.g., voltage, circuit loading) that cannot be resolved through normal/routine control actions and requires shedding of non-dispatchable load.</li></ul>

**Advice to ECCC** - The approach in the Update Report, under which a system operator's declaration of emergency triggers an exemption from the standards in the regulations, recognizes that emergencies can occur without warning and gives system operators the flexibility to react in real-time. However, the final regulations should apply this exemption for the duration of an emergency, without requiring Ministerial approval or review. System operators, like air traffic controllers, must have authority to direct actions to address an emergency for the duration of the emergency. In the case of transmission security related emergencies, this may require operation of specifically located equipment, regardless of timing, cost or emissions. Further, a generator should be exempt from the offences provisions of the legislation for the duration of an emergency declared by the system operator, as any uncertainty over the application of these provisions during a review or approval period could influence compliance with the system operator's directions. Failure to comply with system operator directions in an emergency situation would be likely to impact reliability.

**Actions in Advance of Reliability Events:**

Failures on the electricity system happen instantly. In recognition of this fact, reliability standards obligate system operators to take appropriate actions to prevent emergencies. Consistent with NERC Reliability Standards, the IESO's practice is to take actions ahead of real-time to address extreme weather, flexibility events, and degraded transmission system performance. Examples include forest fires, freezing rain, extreme cold, high winds.

**Advice to ECCC** – As a result, the IESO recommends that the exemption from the standards in the regulations apply not only when the system operator has declared an emergency, but when the system operator takes action to prevent an emergency, including when it declares a high-risk operating state. Consistent with the recommendation in relation to real-time emergencies, a generator should be exempt from the offences provisions of the legislation for the duration of a period where the system operator is taking action to prevent an emergency.

**Long Duration Emergencies:**

Failures to equipment on the system may require specific unit dispatch for extended periods. Examples include loss of transmission lines or loss of a nuclear station due to equipment or environmental conditions. Examples – loss of transformers feeding an urban centre could take months to address. Failure of a common safety system (vacuum building) could make an entire nuclear plant unavailable while the issue was investigated and corrected.

Long-term weather conditions could also create capacity/energy shortages. Example – drought impacting hydro-electric capability could impact an entire year.

**Advice to ECCC** – As a result, the final regulations should apply the exemption from the standards in the regulations for the duration of an emergency, without requiring Ministerial approval or review, even in situations where the emergency applies for an extended period.

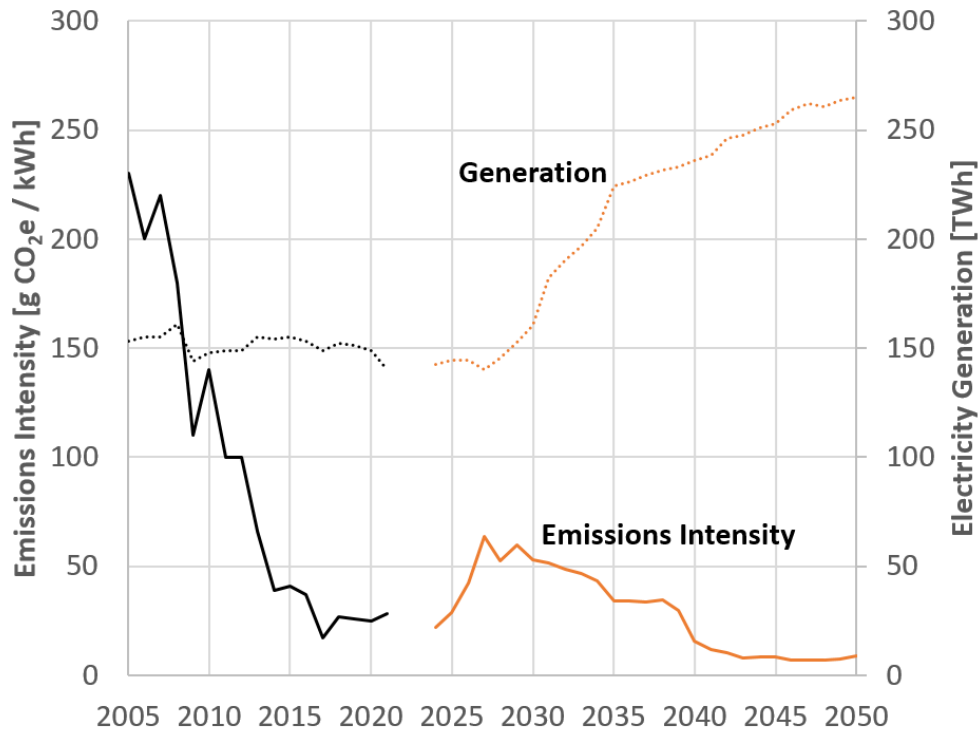
## **Appendix B – Key Findings of IESO’s Emissions Forecast**

The IESO has forecasted future provincial electricity system emissions based in part on development of the new non-emitting resources outlined in POG, existing natural gas generators with a 30-year EoPL, a 450 hours of annual operation peaker provision, and other new resources needed to meet system demands between now and 2050. As previously indicated, prior to the publication of the final CER in Gazette 2, the IESO recommends that ECCC publish a follow-on report that includes specific language and values to which the undefined elements of the provisions included the Update Report will be set to allow the IESO an opportunity to assess the effect of the proposed revisions on its electricity system.

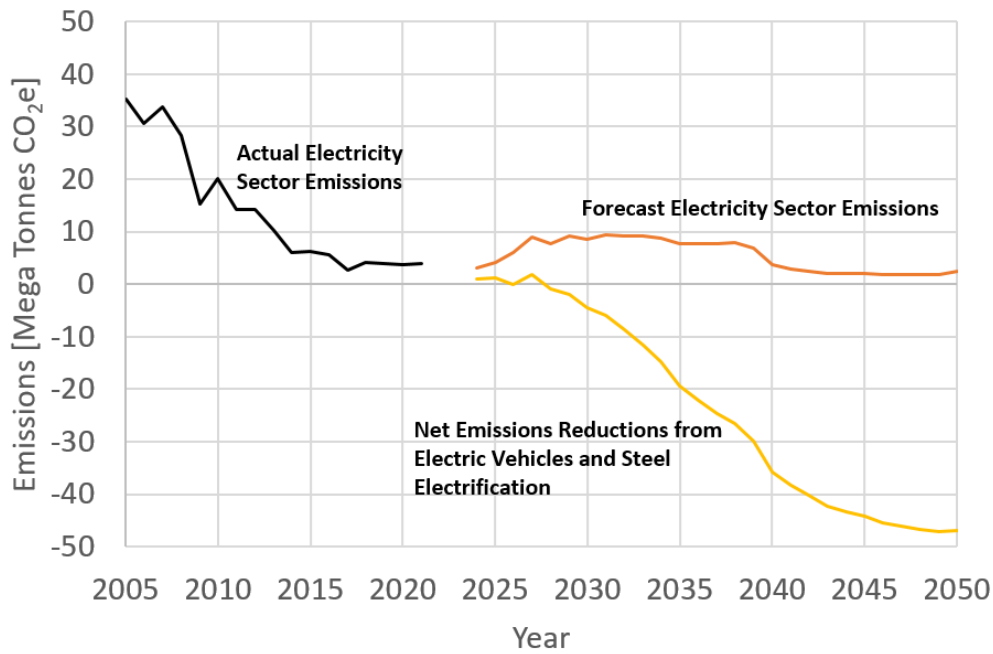
The key findings of the IESO’s forecast are presented below:

- Starting around the end of this decade, Ontario’s electricity system would be expected to become cleaner every year. As new non-emitting supply comes online and nuclear refurbishments continue, every unit of electricity used to power a vehicle, home, or factory will be less emissions-intensive. This will enhance the emissions-reducing potential of electrification of other sectors, while also ensuring Ontario remains an attractive place for companies seeking jurisdictions with clean electricity supply.
- Appendix Figure 1 provides a trajectory of generation and emissions intensity from the electricity system as determined through the IESO’s analysis. As a result of new non-emitting resources coming online, including those outlined in POG, Ontario is able to reduce its emissions intensity while supporting increasing demand brought on by electrification.
- Appendix Figure 2 provides a trajectory of total emissions, contrasting emissions produced by Ontario electricity generation with emissions reduced from electrification of transportation. While there will be a significant increase in generation output throughout the 2030s to meet growing demand, total emissions will hold steady, reflecting gas generation’s decreasing percentage of overall supply. Despite increasing demand, total emissions decline in the 2040s as more gas generation becomes subject to CER restrictions and more non-emitting supply comes online.
- Ontario’s electricity system will be expected to support new demand from electric vehicles and electrification of industrial process and domestic heating. This will result in significant economy-wide emission reductions, but only if Ontario’s electricity system can remain reliable and affordable. Risks to reliability or affordability could jeopardize the grid’s ability to support emissions reductions from other sectors.

**Appendix Figure 1: Trajectory of Generation and Emissions Intensity<sup>3</sup>**



**Appendix Figure 2: Trajectory of Total Emissions<sup>4</sup>**



<sup>3</sup> Historical data sourced from ECCC's Greenhouse Gas Inventory Report.

<sup>4</sup> *Ibid.*