Feedback Form

Long-Term 2 RFP – April 24, 2025

Feedback Provided by:

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Email: [redacted]

Date: 9 May 2025

To promote transparency, feedback submitted will be posted on the LT RFP engagement page unless otherwise requested by the sender.

☐ **Yes – there is confidential information, do not post**

X **No – comfortable to publish to the IESO web page**

Following the LT2 RFP April 24, 2024, engagement webinar, the Independent Electricity System Operator (IESO) is seeking feedback from stakeholders on the items discussed. The presentation and recording can be accessed from the LT2 engagement web page.

Note: The IESO will accept additional materials where it may be required to support your rationale provided below. When sending additional materials please indicate if they are confidential.

Please submit feedback to engagement@ieso.ca **by May 9, 2025.**

Tariff Risk Mitigation

Do you have any comments related to the tariff risk mitigation concepts presented during the webinar?

The Tariffs are already beginning to impact our economy, and we are expected to enter a recession very soon. It is not wise to embark on procurements to become an 'energy superpower' when we are heading into a recession, and much of this will impact ratepayers.

LT2 RFP and Contract Updates

Do you have any comments related to the other RFP and Contract updates presented during the webinar?

No.

LT2 RFP Requirements for Crown Land Projects

Do you have any comments regarding the new Proposal Submission requirements for Crown Land Projects?

No.

LT2 RFP Deliverability Update

Do you have any comments regarding the deliverability guidance updates presented during the webinar?

I saw no mention of hydroelectric power in the LT2; however, earlier, there was talk that some hydropower projects could come through this stream. Consequently, I am addressing that possibility here.

General Comments/Feedback

The Ontario Rivers Alliance (ORA) is a not-for-profit grassroots organization with a mission to protect, conserve and restore riverine ecosystems all across Ontario. The ORA advocates for effective policy and legislation to ensure that development affecting Ontario rivers is environmentally and socially sustainable.

RESOURCE ELIGIBILITY: HYDROELECTRIC

For over a century, hydropower has been greenwashed as a clean, renewable, and non-emitting energy source. In reality, hydro dams and their reservoirs are major drivers of climate change--emitting methane, carbon and nitrous oxide throughout their entire lifespan. Beyond greenhouse gases, their operations can reduce water quantity for long durations of time, degrade water quality, result in erosion, sedimentation, methylmercury contamination in fish, disrupt ecosystems, and threaten biodiversity. Far from being a clean and sustainable solution, hydropower poses serious environmental risks as long as the dam remains standing.

Competition Act and Greenwashing:

On April 30, 2024, Parliament amended the *Competition Act* in Bill C-59 to explicitly address greenwashing. The *Act* requires that environmental claims be evidence-based as they relate to deceptive, misleading, and false marketing provisions. Claims about the future can be considered greenwashing if they represent little more than wishful thinking and are especially serious for businesses regarding internationally recognized methodologies related to common claims of achieving net-zero.[1]

Environmental claims matter to consumers and influence their decisions, which is a primary reason for businesses making these claims in the first place. Note: Underlining is for emphasis only.

For instance, in February 2023, ORA confronted Ontario Power Generation and the Ontario Minister of Energy for promoting hydroelectric power generation as clean and non-emitting. Between 2013 and 2022, OPG sold over $5.5 million in Clean Energy Credits (CEC) in a private revenue-making scheme to offset greenhouse gas (GHG) polluters that, in effect, ended up paying OPG to fuel climate change.[2] This is precisely the type of disinformation that would be considered greenwashing and likely considered fraudulent.

CECs are purchased by companies and governments to offset their own emissions from fossil fuel-generated electricity to help them reach their climate goals. A CEC guarantees that one megawatt-hour of electricity comes from non-emitting sources.[3]

For 10 years, OPG did not disclose its CEC sales to the public and instead actively promoted these claims through its misleading labelling of clean, non-emitting and renewable hydropower. It would be highly relevant to clients purchasing CECs, to understand that hydroelectricity does indeed generate significant amounts of GHG emissions, the worst of which is methane. Yet it was very clear in a 2016 OPG-commissioned Intrinsic report that they knew the process of decomposition of biomass in a reservoir was well understood as the source of carbon and methane emissions, "*similar to those associated with gas-fired facilities".*[4]

Misleading Claims of Clean, Renewable and Non-emitting:

Promotion of hydropower as "clean," "renewable," and "non-emitting" is some of the more common and serious disinformation being presented to the world during this growing climate crisis, which is threatening humanity's very existence on this planet.

There are almost three decades of independent peer-reviewed studies refuting these claims, with reports that hydroelectric reservoirs in boreal, temperate and tropical regions are a significant and ongoing source of biogenic GHGs, including methane, which in some instances can reach the same emission rate as gas-fired facilities. [5]

In fact, a 2004 Environment Canada report states

> *"Largely because of the climate-change driven pursuit of "clean" energy sources, attention has also focused on the role of water storage in affecting production and*

emission of greenhouse gases (GHG). In contrast to the widespread assumption (e.g., in Intergovernmental Panel on Climate Change [IPCC] scenarios) that GHGs emitted from reservoirs are negligible, measurements made in boreal and tropical regions indicate they can be substantial." [6]

When a dam is built and land is flooded to create a reservoir, microbes decompose submerged organic matter. Throughout the dam's life, sediment and biomass accumulate behind it, in a process leading to methane, carbon dioxide and nitrous oxide emissions.

Methane is generated in reservoirs from bacteria living in oxygen-starved environments. These microbes feast on rotting organic matter from plants for energy, just like people and other animals, but instead of breathing out carbon dioxide, they breathe out methane.

Lakes and rivers can be a source or a sink of GHG emissions; however, as organic matter and sediment continue to accumulate in the reservoir behind the dam, it fuels emissions and guarantees the continued release of methane from the reservoir.

Additionally, river networks with high nutrient and sediment loading from agricultural or wastewater effluent provide microbial communities with a more significant source of nutrients, which can deplete sediment oxygen and further fuel methane production. When water bodies become eutrophic, algal blooms can result in excessive nutrient loading that enriches reservoir sediments, thus enhancing methane production.[7]

A 2016 study reported that the effect of damming on methane emissions conducted in a central European impounded river revealed that the reservoir reaches are a major source of methane emissions and that areal emission rates far exceed previous estimates for temperate reservoirs or rivers. It showed that sediment accumulation correlates with methane production and subsequent ebullitive release rates. Results suggested that sedimentation-driven methane emissions from dammed river hot spot sites can potentially increase global freshwater emissions by up to 7%.[8]

A more recent study out of Quebec quantified the long-term historical and future evolution of GHG emissions from 1900 to 2060, examining the cumulative global surface area of 9,195 reservoirs in four different climate zones (boreal, temperate, subtropical, and tropical) around the world. It reported:

> *"reservoir-induced radiative forcing continues to rise due to ongoing increases in reservoir methane emissions, which accounted for 5.2% of global anthropogenic methane emissions in 2020. We estimate that, in the future, methane ebullition and degassing flux will make up >75% of the reservoir-induced radiative forcing, making these flux pathways key targets for improved understanding and mitigation.*
>
> *While CO_2 and CH_4 diffusion are modelled as decreasing with reservoir age, ebullition and degassing remain constant, such that these two latter emission pathways grow increasingly important with time. Thus, while CO_2 diffusion was the dominant flux pathway in the twentieth century, C–CH_4 emissions, mainly via ebullition and degassing, are expected to surpass C–CO_2 around 2032 and account for 75% of reservoir C emissions by 2060. In addition, the higher greenhouse warming potential of CH_4, relative to CO_2, amplifies the climate impact of CH_4 emissions. Furthermore, estimated fluxes do not*

account for future global temperature increases or water eutrophication changes, both of which would probably stimulate CH_4 emissions more strongly than CO_2. Methane emissions, and especially CH_4 ebullition and degassing are expected to dominate future reservoir C-GHG release (39% and 32% in 2060, respectively; (Fig. 2 - below), implying that mitigation efforts aimed at reducing CH_4 fluxes via pathways could be quite effective."[9]

Total GHG emissions generated by a hydroelectric facility is dependent upon many factors, including the impounded reservoir size, depth, terrain, amount of organic matter (algae and plant/tree litter) in and around the reservoir, air-water temperature, pH values, oxygen levels, flow velocity, water level fluctuations, wind speeds, precipitation, wetlands within the impoundment zone, upstream developments and facility operating strategy (cycling and peaking to maximize power generation). Every hydroelectric facility is unique in its complexity and operation and must be carefully studied and continually assessed and monitored to determine the total daily, seasonal and average annual GHG emissions per MWh emanating from the system.[10]

The hydroelectric industry frequently claims its facilities will generate power for 100 years or more. For instance, a Swiss study of a temperate hydropower reservoir indicates that "*the total methane emissions coming from Lake Wohlen, was on average > 150 mg CH_4 m^{-2} d^{-1}, which is the highest ever documented for a midlatitude reservoir. The substantial temperature-dependent methane emissions discovered in this 90-year-old reservoir indicate that temperate water bodies in older headponds can be an important but overlooked methane source"*.[11]

In fact, Ontario Power Generation is in the process of rehabilitating several of its 66 hydroelectric facilities in Ontario, including the 117-year-old Kakabeka Falls Generating Station. This means it will likely spew out copious amounts of methane for another 100 years.

Indeed, waterpower makes a significant daily contribution to the earth's accumulation of GHGs in the atmosphere, which has resulted in significant and ongoing negative effects on water quality, water quantity, ecological processes, fish and wildlife populations, habitat, and Indigenous communities.

It is no wonder governments downplay the amount of GHG emissions, especially methane, coming from their hydroelectric facilities, as there is a lot at stake. Just imagine how long it would take to reach net-zero if all of Canada's hydroelectric facilities were measuring their GHG emissions. Canada relies heavily on hydroelectric power generation, at 61.7% of its energy mix, and is the second-largest producer in the world. The provinces are also well invested in hydropower, with Ontario at 23%, BC at 91%, Manitoba at 97%, Saskatchewan at 20%, New Brunswick at 21%, and Quebec at 95% of the electricity mix.

And again, we find ourselves in the planning phase of another clean/green/renewable energy rush of new and upgraded hydroelectric procurement coming down the pipes. The Ontario government, IESO, OPG and other proponents are all implicated in this ongoing and deliberate greenwashing. Is it willful blindness or just plain ignorance to move forward with the procurement of these Boondoggle projects again?

What the Intergovernmental Panel on Climate Change (IPCC) has to Say:

We need to look no further than the 2019 Refinement of the IPCC Guidelines for National Greenhouse Gas Inventories, which informs that carbon dioxide, methane and nitrous oxide emissions coming from flooded lands, including hydroelectric reservoirs, can be significant.[12]

The IPCC guidelines report on several key factors to take into account when considering hydroelectric projects with flooded lands (reservoirs).

> "*Flooded Land emits CO_2, CH_4 and N_2O in significant quantities, depending on a variety of characteristics such as age, land-use prior to flooding, climate, upstream catchment characteristics and management practices. Emissions vary spatially and over time.*"[12]

> "*Flooded Land is defined as: water bodies where human activities have caused changes in the amount of surface area covered by water, typically through water level regulation. Examples of Flooded Land includes reservoirs for the production of hydroelectricity, irrigation, and navigation.*"[13]

> *"Emissions of CH_4 from Flooded Land are primarily the result of CH_4 production induced by anoxic conditions in the sediment (see Annex 7.1). Methane can be emitted from small lakes or reservoirs via diffusive, ebullitive, and downstream emissions. Downstream CH_4 emissions are subdivided into degassing emissions (see Glossary) and diffusive emissions, which occur downstream from the flooded land. Methane emissions are generally higher in waterbodies with high organic matter loading and/or high internal biomass production, and low oxygen status. Due to their high emission rates and large numbers, small ponds of area < 0.1 ha have been estimated to generate 40 percent of diffusive CH_4 emissions from open waters globally (Holgerson & Raymond 2016). Whilst emissions from natural ponds can (at least in part) be considered natural, those from small constructed waterbodies are the result of anthropogenic activity."* [14]

For instance, the 2019 IPCC Refinement of the 2006 Guidelines for National Greenhouse Gas Inventories informs that:

> *The range of Flooded Land considered in this chapter are listed in Table 7.7."*[15]

TABLE 7.7 (NEW)
TYPES OF FLOODED LAND, THEIR HUMAN USES AND GREENHOUSE GAS EMISSIONS CONSIDERED IN THIS CHAPTER

Flooded Land types	Human Uses	Greenhouse gas emissions for which guidance is provided in this Chapter
Reservoirs (including open water, drawdown zones, and degassing/downstream areas)	Hydroelectric Energy Production, Flood Control, Water Supply, Agriculture, Recreation, Navigation, Aquaculture	CO_2, CH_4
Canals	Water Supply, Navigation	CH_4
Ditches	Agriculture (e.g. irrigation, drainage, and livestock watering)	CH_4
Ponds (Freshwater or Saline)	Agriculture, aquaculture, recreation	CH_4

> *Emissions of CH_4 from Flooded Land are primarily the result of CH_4 production induced by anoxic conditions in the sediment (see Annex 7.1). Methane can be emitted from small*

lakes or reservoirs via diffusive, ebullitive, and downstream emissions. Downstream CH_4 emissions are subdivided into degassing emissions (see Glossary) and diffusive emissions, which occur downstream from the flooded land. Methane emissions are generally higher in waterbodies with high organic matter loading and/or high internal biomass production, and low oxygen status. Due to their high emission rates and large numbers, small ponds of area < 0.1 ha have been estimated to generate 40 percent of diffusive CH_4 emissions from open waters globally (Holgerson & Raymond 2016). Whilst emissions from natural ponds can (at least in part) be considered natural, those from small constructed waterbodies are the result of anthropogenic activity.[16]

Fugitive emissions from hydroelectric operations are anthropogenic in nature: the dam infrastructure, including the turbine intake, spillway, reservoir, the biomass trapped behind the dam and the cumulative effects that result from human activity.

"This volume [Volume 2-Energy] provides methodologies for the estimation of fugitive emissions of CO_2, CH_4 and N_2O. Fugitive emissions tend to be diffuse and may be difficult to monitor directly. Methodologies for estimating fugitive emissions from the Energy Sector are very different from those used for fossil fuel combustion. However, if these emissions can be measured, they should be reported in source category 1.B.3 "Other emissions from energy production".[17]

Hydroelectric GHG emissions can be detected, measured and reported with high efficiency and accuracy using drone[18] or GHGSat[19] technologies. ORA asked OPG to become a leader in the hydropower industry by using drone technology to detect and measure GHG emissions from its 66 hydroelectric facilities in Ontario and 87 facilities in the US; however, it declined this important measure.

Make no mistake, the writing is on the wall for the disclosure of the truth about hydroelectric and its GHG emissions. Canada already includes 57 hydroelectric reservoirs in its annual National Greenhouse Gas Inventory; however, the IPCC is placing increasing pressure on governments to disclose and properly report emissions from all hydroelectric facilities.

It is thus morally and ethically wrong not to acknowledge hydropower's significant and ongoing GHG emissions. Canada has made commitments to the United Nations and its citizens to effectively reduce GHG emissions. Not counting hydropower's contributions will not meet the mark when we are in a crisis situation with our freshwater and with climate change.

Can Hydropower seriously be considered Renewable?

In the past, a very high environmental and socio-economic price has been paid in terms of losses to valued natural resources due to the installation of dams and waterpower facilities. The socio-economic costs of these losses are generally ignored[20,21] and rarely revealed to the public.

The collateral environmental damage caused by dams and waterpower facilities has been well documented for decades, including the loss or serious decline in migratory fish species (waterpower facilities are key factors in the listing of some iconic fish species as species at risk in Ontario and elsewhere)[22,23], declining biodiversity[24], impaired water quality (including elevation of mercury concentrations in fish tissue)[25,26,] and are critical threats to imperiled aquatic species.[27]

Significant ecological damage from waterpower has been ongoing for many decades in Ontario and other locations worldwide.[28] In fact, in Ontario, dams are considered to be a major factor in the extirpation of Ontario's Atlantic Salmon stock[29], one of the most important causes of significant anthropogenic mortalities and decline of Ontario's American Eel[30], and a key threat to Ontario's declining Lake Sturgeon populations.[31,32,33]

The OWA and the waterpower industry have proven to be irresponsible and extremely negligent in offering even the very basics of mitigation to protect fish populations and riverine ecosystem health. There are a total of 225 hydroelectric facilities in Ontario (with many more times that number of control dams to contain the reservoirs), including 66 hydropower facilities owned by OPG; however, only two facilities in Ontario are fitted with operating fishways.

Hydropower as Baseload Power:

Over the last several years, there have been increasing reports of extended droughts reducing hydroelectric generation in Canada, and municipalities and cities have had to rely on natural gas, coal, and diesel to fill the gap.

"Canada's increasing struggle with hydropower is an ill omen representing a wider global problem. Climate change and droughts are threatening hydropower supplies everywhere, and as severe weather events become increasingly common due to climate change, the future of the world's leading renewable energy source is vulnerable. The greatest problem is not just the severity of any drought but the persistence of drought conditions over an extended period of time. The Yale Climate Connection argues that the link between climate change and increasing drought conditions worldwide is demonstrable, and things are getting worse. Global hydropower generation dropped significantly in the first half of 2023,[34] resulting in an overall increase in fossil-fuel power production to make up for the deficit." [35]

The IPCC also reports that "*hydropower plants without or with small storage may be susceptible to climate variability, especially droughts, when the amount of water may not be sufficient to generate electricity (Premalatha et al. 2014) (Section 6.5).*[36]

Consequently, the role of hydropower in helping to provide base power, system balance and stability will be severely affected by climate-related events, which have reduced water availability in many regions in Canada over the last few years, straining power grids, having to resort to burning diesel to fill the gap[37], and raising questions about the resilience and reliability of hydroelectric generation. [38]

When these hydropower facilities are no longer viable, there are no up-front decommissioning provisions in place to remove dams that have outlived their useful life, are threatening a valued or at-risk species, or have become unsafe, uneconomical, or to transform a GHG emitter into a GHG sink. However, they must be maintained and/or removed with taxpayers' dollars because there are no funds in place to remove dams. ORA has advocated strongly for up-front decommissioning provisions; however, the industry's answer is always that hydroelectric facilities can last for 100 years or more, so there is no need to plan for that now. However, there are many older facilities that are no longer in operation and pose critical health and safety risks to the public and the environment. It is the dam owner who has profited from the facility, and it should be the dam owner who pays to have it removed when it is no longer safe or useful.

Health Risks to Indigenous Communities:

Indigenous communities are approached by hydropower developers, who present a glossy and rosy picture of a project's benefits but provide insufficient information about the trade-offs. For instance, it will be a major driver of climate change, methylmercury accumulation in fish tissue, degraded water quality, reduced water quantity, and declining migratory fish populations.

Methylmercury contamination of fish tissue poses a serious risk to those who rely on fish as a main staple in their diet. Once absorbed into the bloodstream, MeHg is carried to the brain and spinal cord, where it wreaks havoc on the nervous system. More specifically, it interferes with the formation and maintenance of nerve cells, as well as the release and reuptake of neurotransmitters. This disruption affects brain function and development, sensory processes, and behaviour.[39]

As highlighted by the ELARP study on Lake 979 and the surrounding wetland system, the construction of a reservoir leads to dramatic increases of 10 to 20 times in both methylmercury and GHGs. Several studies have shown that the same process through which microbes break down submerged plants and organic material to release GHGs also leads to the methylation of mercury present in the system.[40]

Mercury is present as a natural component of soil in its inorganic form (Hg) in trace amounts through natural processes.[41] However, in its organic and methylated form, it is one of the most potent environmental neurotoxins in the world. After the construction of a dam, the methylmercury (MeHg) formed via microbial breakdown persists in riverine soils for decades due to its high affinity for organic matter.[42,43]

Studies have shown that while MeHg is only produced in reservoirs in the first 10 years after its construction, the levels of this compound can remain elevated in the water for several decades afterwards because of its adherence to the sediment.[44,45,46]

One of the central mechanisms behind MeHg's toxicity lies in its ability to concentrate in organisms rather than being excreted, which leads to its magnification as we go up the aquatic food chain.[47] Multiple studies have shown that large predatory fish such as Northern Pike near newly constructed dams and reservoirs contain MeHg levels 3 to 9 times higher than the maximum acceptable level in fish for sale in Canada.[47,48]

People who consume fish or game caught in and around these reservoirs are at risk of mercury poisoning, resulting from prolonged exposure to the toxin, which can affect cognitive ability and be fatal. Indigenous communities are exposed to these toxins at higher rates than other Canadians, as freshwater fish are a significant part of their traditional diets.[49]

In any event, it is clear that a full cost accounting of greenhouse gas emissions and methylmercury production must be conducted and considered before moving ahead with the procurement of new hydropower.

A Recent Court Decision:

A judge in a 2024 Appeal Court decision, Mathur v. Ontario, concluded that: "*Based on the evidence before [her], it is indisputable that, as a result of climate change, the [appellants] and Ontarians in general are experiencing an increased risk of death and an increased risk to the security of the person.*" The judge also found that Ontario's greenhouse gases contribute to climate change in a way that is "real, measurable and not speculative" and that *"[e]very tonne of [carbon dioxide] emissions adds to global warming and lead[s] to a quantifiable increase in global temperatures that is essentially irreversible on human timescales."*[50]

The Supreme Court of Canada rejected Ontario's request to appeal the Ontario Court of Appeal's landmark ruling and has been ordered back to the Ontario Superior Court of Justice, where it will have to defend its climate record and answer for putting Ontarians' constitutional rights, health and futures at risk.[51] This is precisely how hydropower proponents must be held accountable.

CONCLUSION:

In conclusion, the evidence is clear: Hydropower, marketed as clean, renewable, or non-emitting, contributes significantly to greenhouse gas emissions, particularly methane, which has a far greater global warming potential than carbon dioxide. The federal and provincial governments, along with industry stakeholders, must cease the misleading practice of greenwashing hydropower as environmentally benign without acknowledging its substantive and ongoing negative environmental effects. This greenwashing not only undermines public trust but also jeopardizes Canada's ability to achieve its climate goals.

Hydroelectric facilities will last for 100 years or more, so it is essential that full life-cycle costs associated with any new projects are carefully assessed in terms of sustainability, including GHG emissions, the loss of ecosystem services, fisheries, health and safety risks, water quality and water quantity, as well as the eventual decommissioning of the facility. Decommissioning can involve millions of dollars and is likely to be necessary sooner than expected. Rivers will be severely impacted as climate change progresses, and it is already happening in many regions of Canada where rivers are drying up or there is insufficient stream flow to turn the turbines.

It is essential to remember that you can turn off a gas-fired generator when a cleaner technology comes along, but a hydroelectric reservoir will keep on generating methane and elevating methylmercury in fish until the dam is removed, in 100 years or more.

Turning a blind eye to the significant and ongoing environmental effects of waterpower and the blatant disinformation and reasoning behind the bogus claims of non-emitting, clean and renewable hydropower brings to mind the tobacco and oil and gas industries in the 1960s and 1980s. The tobacco industry knew the dangers of smoking to a person's health, yet despite the dangers, it still misled the public into believing it was safe. The oil and gas industry knew all along that oil and gas emissions would lead civilization off a climate cliff, yet failed to act. Don't allow the hydropower industry to do the same.

For all the reasons set out above, the ORA strongly opposes any new hydroelectric facilities being included in the IESO's Long Term and/or Long Lead Time procurements.

Thank you for this opportunity to comment!

Linda Heron,
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[12] *2019 Refinement of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 7, Wetlands, 7.3 Flooded Land. P-6/52. Online: https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch07_Wetlands.pdf*
[13] *Ibid.*
[14] *Ibid.*
[15] *2019 Refinement of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 7, Wetlands, 7.3 Flooded Land. P-6/52.*
[16] *Ibid.*
[17] *2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Chapter 1, Introduction, 1.3.2 Fugitive emissions. P-10 -11/29*

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