ONTARIO RIVERS ALLIANCE

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Policy Coordination and Outreach Branch
Ministry of Energy and Electrification
77 Grenville Street
Toronto, ON
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By email to: IntegratedEnergyPlan@Ontario.ca

Re: ERO-019-9285 - Integrated Energy Resource Plan Consultation

Dear Sirs:

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

The ORA is responding to the Ministry of Energy's stakeholder outreach, seeking feedback to help inform Ontario's first integrated energy resource plan. This government talks about the previous government's hydro mess, but this is pure gaslighting because when it came into power, it cancelled approximately 750 "clean" energy projects, involving incalculable hours of government staff support and taxpayers' dollars, and is now proposing to procure new "clean" energy projects to become an "energy superpower".

It is unclear to the reader what it will cost taxpayers to be an energy superpower, compared to simply fulfilling the electricity needs of the Province; however, $375B to $425B is a daunting investment that is extremely risky considering this investment is relying on this uncertain house of cards. Right now, we are in an energy technology revolution, and quite likely, by the time the long-lead-time projects are ready to power up (up to 10 years), they will most likely be over-priced and unnecessary BOONDOGGLES. They will also be an additional environmental threat to Ontario rivers and humanity.

Greenwashing of Hydroelectric:

When companies convey false, misleading or unsubstantiated claims of environmental benefits or clean, green, renewable, sustainable, or non-emitting, they are considered to be engaging in greenwashing and are exposing themselves to litigation and liability under the deceptive marketing provisions of the *Competition Act* (*Act*). This could be especially problematic for corporations selling Clean Energy Credits (CECs).

It is especially egregious and fraudulent for the hydropower industry and government to use clean and non-emitting labels when selling CECs to those intending to offset their GHG emissions when, in fact, they are paying to emit more GHG emissions.

Labelling hydropower as “clean” is greenwashing its numerous adverse environmental effects that result from its impoundments, diversions and peaking operations. Clean electricity infers that it is generated from sources that have little to no effect on the environment. This “clean” label for hydroelectric misinforms the public despite over three decades of third-party independent research reporting 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 a gas-fired facility.[1]

In fact, the Ontario government has also mislabelled hydropower as "non-emitting" when this was framed as a requirement of the IESO procurement process. In fact, hydroelectric dams with reservoirs contribute approximately 5 to 7% of world greenhouse gas (GHG) emissions - in boreal, temperate, and tropical regions.

Methane is a potent GHG with a heat-trapping capacity 28 to 34 times greater than carbon dioxide over a 100-year time scale, and measured over a 20-year time period, that ratio grows to 84 to 86 times.[2] This is bad news as we already have a serious methane problem. Indeed, Canada, along with 100 other countries, made a global pledge to slash methane emissions by 30% below 2020 levels by 2030.

GHG emissions are fueled by rotting organic matter left behind when the reservoir is initially flooded, as well as vegetation, litter, and organic matter that washes into the system regularly from rain events and seasonal flooding. Lakes and rivers can be a source or a sink for GHG emissions; however, when this organic matter and sediment continually accumulates in the reservoir behind the dam, it fuels emissions and guarantees the continued release of methane from the reservoir throughout the dam's life.

Additionally, river networks with high nutrient and sediment loading from agricultural or wastewater effluent provide microbial communities with a more significant source of nutrients that can deplete sediment oxygen and fuel even more methane production. When water bodies become eutrophic, algal blooms can result in excessive nutrient loading, further enriching reservoir sediments that fuel methane production.[3]

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. It showed that sediment accumulation correlates with methane production and subsequent ebullitive release rates. Results suggest that sedimentation-driven methane emissions from dammed river hot spot sites can potentially increase global freshwater emissions by up to 7%.[4]

Also, a 2021 study revealed that “*reservoir drawdown areas, where sediment is exposed to the atmosphere due to water level fluctuations, are hot spots for carbon dioxide emissions.* Researchers used monthly data based on satellite imagery and considered the size of water surface areas from around 6,800 dams worldwide between 1985 and 2015. For these 30 years, the scientists were thus able to determine exactly when, where, and for how long the dams were not completely filled and how large the dry areas were. On average, 15% of the total reservoir surface was not covered by water. Scientists used this figure to further calculate the carbon

release from these areas. *"Our calculations show that carbon emissions from dams had been significantly underestimated. On a global average, they release twice as much carbon as they store. Their image as a net carbon store in the global carbon cycle must be reconsidered*." [5]

An Intergovernmental Panel on Climate Change (IPCC) 2022 report warns that "*While hydropower reduces emissions relative to fossil fuel-based energy production, hydropower reservoirs are being increasingly associated with GHG emissions caused by submergence and later re-emergence of vegetation under reservoirs due to water level fluctuations (Räsänen et al., 2018; Song et al., 2018; Maavara et al., 2020).*"[6]

The IPCC has recognized the significant and ongoing GHG emissions, including methane, generated from hydropower reservoirs. In fact, it has advised countries to include these emissions in their annual GHG Inventories, and since 1993, Canada has been reporting GHG emissions in its National Inventory Report, including methane, coming from 57 hydroelectric reservoirs in four provinces, Quebec, Manitoba, British Columbia, Newfoundland and Labrador. Very soon, all hydropower facilities will be required to report its emissions.

It is also important to consider that creating a hydroelectric reservoir on a previously untamed riverine ecosystem can transform a healthy ecosystem from a GHG sink into a relatively large source of emissions into the atmosphere.[7]

Consequently, your Emissions Forecast Table in Ontario's Affordable Energy Future[8] report is incorrect, as the emissions generated by hydroelectric reservoirs are significant and unaccounted for in the table.

Small Hydro is also a Problem:

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).*[9]

With smaller dams, storage becomes increasingly important. Reservoirs silting up or becoming overloaded with nutrients are common problems. They are at least as serious where shallower water bodies are created. The shallower a water body, the more vulnerable it is to thermal warming and the more eutrophic it can become. Likewise, methane generation occurs largely where water and sediment meet. This means that a shallower water body is likely to release more methane per unit area than a deeper water body. Shallow reservoirs are not unlike paddy fields and biomass generation, which are known to contribute substantially to methane emissions.[10]

Most small hydroelectric facilities rely on peaking/cycling operating strategies to maximize power generation during peak demand hours. The hourly and/or daily water level fluctuations and repetitive wetting and drying effects over vast areas of the reservoir amplify the volume of GHGs released into the atmosphere.

The daily, seasonal, and annual variations of run-of-river operations are intermittent and unreliable because generation peaks during the high flows of spring when power is in low demand and produces at its lowest during the hot summer months when consumption and demand are at their highest. During the low flow season of summer or during drought conditions, many run-of-river and even some peaking (storage) facilities on smaller rivers cannot operate efficiently and must be shut down.

There have been numerous reports of extended droughts causing reduced hydroelectric generation for extended periods, and municipalities and cities having to rely on natural gas, coal and diesel to fill the gap. There have also been a number of accounts of rivers and lakes going dry. In addition, average temperatures in the north have been accelerating at twice the rate of anywhere else in the world.

Run-of-river dams are vulnerable to water shortages, which will only increase as temperatures continue to climb.[11] As temperatures rise and sediment and leaf litter are trapped behind the dam, GHG emissions, including methane, will be released at the turbine intake, spillway, and outflow downstream of the dam.

A cost/benefit analysis should be required to determine whether these types of projects are environmentally and/or economically sustainable and whether they should even qualify for certification and CECs.

Other Environmental Issues with Hydropower:

The collateral damage, including the loss and serious decline in many iconic migratory fish species, declining biodiversity, impaired water quality, and elevated mercury concentrations in fish tissue, have also been well-documented for decades.

New reservoir flooding accelerates the bioaccumulation of methylmercury in fish tissue, and these effects can persist for as long as the dam is in place.[12],[13] This can remove fish as a primary source of food from Indigenous and other stakeholder communities for generations.

In Ontario, there are 224 hydroelectric facilities, with only two that have provided operating fish passage. Proponents are also not required to provide up-front decommissioning provisions when these BOONDOGGLE HYDROPOWER PROJECTS can no longer generate power due to diminishing water availability, failure due to flooding and/or the age factor.

These are all significant issues, as many existing facilities are already over 100 years old and are now being rehabilitated to last another 100 years. For instance, OPG is reconstructing the Kakabeka Falls Generating Station, which is already 117 years old. So, it will soon contribute another century's worth of carbon and methane into our atmosphere when it is vital that we cut emissions.

You can turn a gas-fired facility off when a better form of electricity comes along, but a reservoir on a river system will emit methane and carbon until the dam is removed.

Very soon, there will be an authentically clean, inexpensive and non-emitting power source available, and these hydropower facilities will be left to block and pollute Ontario rivers for the next 100 years, with no funds available to remove them. They will become stranded assets left for the ratepayers/taxpayers to shoulder the costs of removal.

Becoming an Energy Superpower is A House of Cards:

The IESO forecasts electricity demand to increase by 75 percent by 2050, betting on electric vehicles (EVs) becoming more popular; however, EVs are not practical in northern Ontario and

can place lives at risk during winter months when driving long distances. EVs will not be viable in the north until batteries improve with longer and more reliable charges.

Some of the many cons of owning an electric vehicle are limited charging infrastructure, long charging times, limited driving range, initial cost, battery replacement cost, ongoing battery degradation, and range anxiety. Electric vehicles are not practical in northern Ontario's rural areas.[14]

As such, this government is building a house of cards reliant upon EV sales. However, recently, Umicore Rechargeable Battery Materials, an EV battery company, delayed the construction of its plant, citing a "*significant worsening of the EV market context and the impacts this has on the entire supply chain.*"[15] Instead of reducing bills for ratepayers in Ontario, this government is forcing a higher risk upon ratepayers and taxpayers when the demand fails to materialize.

Ontario ratepayers did not mandate this government to position the province as an "*energy superpower*", to exceed electricity demand or to pursue export opportunities. We are living in very uncertain times in this warming climate. The labelled "*costly and unnecessary carbon tax"* will pale in the face of the cost to ratepayers to become an energy superpower!

This government lowers the cost of electricity for businesses in Ontario by placing much of the financial burden on the shoulders of ordinary ratepayers, and becoming an energy superpower will be another huge burden ratepayers will carry for generations.

Hydropower and Drought:

Many rivers in Canada are experiencing significant reductions in flow due to climate change. For communities that rely on these rivers, the results can be devastating as they are critical lifelines, especially for Indigenous communities. The construction of dams and diversions for hydropower and other purposes disrupts the natural flow patterns, disconnects rivers from their floodplains and degrades water quantity, especially in the face of drought.

A 2014 analysis was conducted by the IESO to determine the best means of electricity connection to remote First Nation communities and to enable forecasted growth in the Ring of Fire mining operations in northern Ontario. The analysis concluded that "*Northern hydroelectric generation is an energy-limited resource known to have significantly reduced output and availability during drought conditions of the river system supplying these generating units.*[16]

In 2015, the IESO reported that run-of-river efficiency in the generation of power was only 15 to 30% of Installed Capacity.[17] In fact, the recommendation in their report was to <u>not</u> build any new hydroelectric facilities but to primarily build new transmission lines.

Manitoba Hydro boasts it has one of the cleanest grids in the country, but because of growing drought conditions, it is banking on fossil fuels long into the future. It has used more natural gas-fueled electricity in the last 12 months than in the last decade. It's a foreshadowing of the uncertain future hydropower faces. Manitoba has used more natural gas-fueled electricity in the last 12 months than in the last decade. It's a foreshadowing of the uncertain future hydropower faces. *From 2013 to 2023, the utility has run its natural gas generators for an average 54 gigawatt-hours of power; this year, the province has used 122 GWh, according to data provided by Manitoba Hydro. The drought conditions took a toll on the province's hydroelectric reserves this year, prompting the utility to import electricity as well as running its backup thermal generators*.[18]

Conclusion:

Ontario's Affordable Energy Future made it clear that our feedback would be carefully reviewed; however, there is not much hope of it being considered when it clearly states that "*Ontario intends to take early actions towards meeting the challenges laid out in this document in the weeks and months ahead*." It sounds like it's already a done deal!!

ORA strongly opposes the government's pursuit of becoming an energy superpower and expanding electricity procurement beyond Ontario's specific and ten-year forecast for electricity needs.

We are also strongly opposed to any new hydroelectric for all the reasons set out above, as the emphasis should be strictly on true and authentic clean, non-emitting electricity sources.

Thank you for this opportunity to comment!

Respectfully,

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