George, Sonu (ENERGY)

From: Mark S Winfield <marksw@yorku.ca>
Sent: May 24, 2023 12:33 PM
To: Energy, Minister (ENERGY)
Cc: Hsu, Ted; tabunsp-qp@ndp.on.ca; mschreiner@ola.org; Electrification and Energy Transition Panel
Subject: Re: IESO Pathways to Decarbonization Study ERO number 019-6647
Attachments: Smith Cover P2D Cover letter May 2023.pdf; IESO Pathways Submission May 2023.pdf

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Dear Minister Smith,

I regret that due to my administrative responsibilities related to the end of the academic term I was not able to submit comments the IESO Pathways to Decarbonization Study within the required deadline. I submit the following comments now in the hope that they will be considered by you, your staff and your officials.

In addition to my comments on the ERO posting, I have also attached an appendix summarizing research and other activities relevant to the themes in the IESO pathways study undertaken under the auspices of the Sustainable Energy Initiative at York University for your information.

I would be pleased to respond to any questions you may have regarding my comments on this initiative.

Yours sincerely,

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Comments re: IESO Pathways to Decarbonization Study; ERO number 019-6647

Mark Winfield
Professor
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May 2023

General comments

It is important to not view the Pathways to Decarbonization study as plan, or to treat it as such for policy and decision-making purposes. Rather it represents one contribution in a series of studies that have been undertaken by different entities, including The Atmospheric Fund, David Suzuki Foundation, Canadian Climate Institute, the Trottier Institute and the IESO itself on potential pathways to decarbonization for Ontario and Canada. As such it should be seen as one in a series of 'thought experiments' on what pathways to net zero might look like and their potential implications. Its conclusions and directions need to be examined in the context of the conclusions of other studies that have been undertaken in this regard, many of which highlight different, and potentially lower cost, impact, and risk pathways to decarbonization.

It is also important to keep in mind that the province has no effective overall strategy related to climate change and decarbonization. The province's most recent plan, December 2018 Made in Ontario strategy is effectively, as noted by the Auditor General and Environmental Commissioner, a dead letter, around which no significant implementation measures have been taken. The province remains committed to policies, like the expansion of the natural gas grid, which are difficult to reconcile with a commitment to decarbonization. To undertake investments on the scale proposed in the pathways study in the absence of clear policy commitments, directions and implementation strategies from the province around decarbonization in key areas like transportation and space heating could be seen as bordering on the reckless, entailing major economic and environmental risks for the province.

It also must be recognized that the province has no meaningful planning process around climate change or the electricity system. While the work of the Electrification and Energy Transition Panel in this regard is welcome it is far from complete. Investments on the scale contemplated in the pathways study, particularly in relation to high-cost, high-risk, high-negative impact and high-lock-in effect generating infrastructure (e.g. new nuclear and large hydro) cannot proceed in the absence of a meaningful, substantive, effective, independent public review process to evaluate these risks, and the need for, and alternatives to, such commitments.

Even with a robust and rigorous planning process moving towards a net zero electricity sector presents significant challenges. Planning and decision-making needs to move forward to address the challenge of climate change amid a highly complex and uncertain environment with rapid technological changes. This is especially the case in the electricity sector in areas like energy storage, renewables, DERs, demand management and grid operation and integration.

In that context, it is unclear how much of the anticipated demand from electrification will or needs to materialize as centralized grid demand that will have to be served by new large centralized generating assets. Much of the growth in demand may be met through demand side measures, DERs, self-generation and other emergent options.

These are high-risk choices given the Canada's record of electricity utilities near bankrupting themselves (and in some cases their provinces as well) building large, high-cost centralized infrastructures in anticipation of demand that never materializes.

My responses to the specific questions posed by the ministry are informed by these overall observations.

Responses to ministry questions regarding the IESO's Pathway study

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?

Response

Infrastructure requiring 5-10 years for approvals will typically be large, capital intensive, high-adverse impact and carry high economic and technological lock-in risks, such as new nuclear or large hydro electric projects. Given these features, such projects should be subject to substantive and meaningful reviews of their likely impacts and risks, and the availability of alternative approaches to meeting electricity needs and advancing decarbonization that may entail more manageable risks, be scalable, lower-impact, and involve much shorter planning and approval timelines. 'Streamlining' of approvals for large-scale, capital-intensive generation projects should not be supported for these reasons, particularly given the weakness or non-existence of meaningful review approval processes, particularly under what remains of the province's environmental assessment process. Recent events in British Columbia (Site C) and Newfoundland and Labrador (Muskrat Falls) have highlighted the economic, environmental and technological risks flowing from 'streamlined' approvals for large energy projects.

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?

Response

As noted earlier, these types of projects, particularly new nuclear and large hydro projects, are associated with high levels of economic, environmental and technological risks. They need to be subject to meaningful, substantive, transparent, public and independent review processes before they proceed, including considerations of the need for these facilities, and the availability of alternatives to them.

Activities which may affect the rights or interests of Indigenous communities are subject to the Crown's 'duty to consult' with the affected Indigenous communities and need to respect Treaty and traditional rights. The courts have made clear that consultation in these contexts must be meaningful and substantive, and proportionate to the anticipated impacts on the affected communities. For projects likely to have large impacts, like major new hydroelectric projects in Northern Ontario, the standard of review for such consultations will be high. Attempts to circumvent them will be counterproductive and lead to legal and political conflicts with the affected communities.

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?

Response

No - the IESO's own DER study makes it clear that short term needs can be met through DER and demand response measures. The Atmospheric Fund's Net-Zero study reaches similar conclusions. The development of significant new fossil fuel generating capacity is contrary to the goal of decarbonization, and embeds continued reliance on fossil fuels.

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?

Response

The costs contained in the IESO study may be beyond the capacity of the province to sustain, requiring capital investments of ~$20 billion/yr., a figure in excess of the current annual total economic activity in the electricity sector. As noted earlier, the province has no comprehensive strategy with respect to decarbonization, and no specific strategies decarbonization strategies in key sectors like space heating and transportation. Indeed existing policies in these areas, like gas grid and highway expansion, and the removal of references to climate change from the province's planning policies, are contrary to electrification and decarbonization strategies.

As noted in my general comments above, number of other studies completed in the past year highlight different, and lower-cost pathways to decarbonization, with particular emphasis on demand side measures, including improvements in energy efficiency and productivity. The study completed for The Atmospheric Fund is particularly noteworthy in this regard. The study authors also note the potential for additional efficiency opportunities to emerge through electrification strategies.

The province's approach should be one of energy systems integration, not simple electrification. All technically feasible, economically rational and achievable efficient gains should be pursued as the foundation of the province's strategy. The full potential contributions of distributed energy resources should be considered, along with further expansion of low-impact renewable resources, coupled with appropriate energy storage resources, and opportunities provided through interprovincial connections.

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?

Response

The energy balances for power to gas strategies are generally very poor, indicating that direct electrification should be pursued wherever possible, and hydrogen-based strategies pursued only in areas where direct electrification is not feasible (e.g. high quality steel production). Renewable natural gas (RNG) may have some role in decarbonization strategies, but supply limitations make general replacement of fossil gas with RNG infeasible. Demand side strategies should be optimized to the greatest extent possible.

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?

Response

The province needs a comprehensive energy efficiency and productivity strategy, covering electricity and natural gas utilization. See the recommendations in the February 2020 Sustainable Energy Initiative study Unlocking the Climate Potential of Energy Efficiency regarding elements of such a strategy for Ontario.

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?

Response

The impacts of new hydroelectric generation capacity on the affected Indigenous communities would be very significant, as would the environmental and climate change impacts of such developments. The obligations to consult with the affected Indigenous

communities would be extremely high. Indeed, the only recent precedent for such a situation is the Paix des Braves agreement in Quebec, which is effectively a new, modern treaty with the affected Indigenous communities. Given the current state of relations between Indigenous peoples in Northern Ontario and the provincial Crown, the negotiation of such an agreement could take many years.

Careful consideration would also have to given to the climate change impacts of major new hydroelectric developments in Northern Ontario, given that the affected boreal and James Bay Lowland regions are globally significant natural carbon sequestration and storage sites. Consideration would also have to given to the role of the region in preserving global biodiversity.

Major new hydroelectric developments in Northern Ontario are likely infeasible for these reasons, and indeed could be counterproductive from a climate perspective.

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?

Response

Need for such corridors needs to be established in an open and transparent manner, subject to meaningful and rigorous external review. Transmission corridors are to a considerable degree derivative of other choices being made around pathways to decarbonization, particularly in relation to questions like the extent to decarbonization related electrification will occur on the basis of large, centralized generating assets vs. demand side and more distributed strategies for needing electricity needs.

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

Response

The IESO's definition of "no-regret" options is poorly conceived and would embed what could turn out to be very "high-regret" options. A more transparent and rigorous approach is needed to identify what should be considered truly "no-regret" options. At this stage optimization of demand side measures, and strategies around the

development of DERs and additional now-impact renewable energy and storage resources may be the only options that fall into these categories.

As background to this submission I am providing the attached list of resources, also provided to the Energy and Electrification Panel.

Appendix

List of Publications Relevant to Electricity System Planning and Decarbonization in Ontario

May 2023

System Planning and Assessment

Winfield, M., Gibson, R., Markvart, T., Gaudreau, K. and Taylor, J., "Implications of Sustainability Assessment for Electricity System Design: The case of the Ontario Power Authority's Integrated Power System Plan," *Energy Policy,* 38 (2010) 4115-4126 and follow-up book chapter:

Winfield, M., "Electricity Planning and Sustainability Assessment: The Ontario Experience," for R.B. Gibson, ed., *Sustainability Assessment: Applications*, (London: Earthscan, 2016) (copy available upon request)

Winfield, M., Mulvihill, P., and Etcheverry, J., "Strategic Environmental Assessment and Advanced Renewable Energy in Ontario: Moving Forward or Blowing in the Wind?" *Journal of Environmental Assessment Policy and Management*, Vol.15, No.2, June 2013, 1-19.

MacWhirter, R., and M.Winfield, "The Search for Sustainability in Ontario Electricity Policy." in G.Albo and R.MacDermid eds., *Divided Province: Ontario Politics in the Age of Neoliberalism* (Kingston/Montreal: Queens-McGill University Press 2019)

Winfield, M., and Saherwala, A., "The Ontario Coal Phase-Out " for M.Howlett, E. Lindquist, G.Skogstad, G.Tellier and P.'t Hart eds., *Successful Public Policy: Lessons from Canada* (Toronto: Oxford, 2022).

Climate Change and Energy Policy

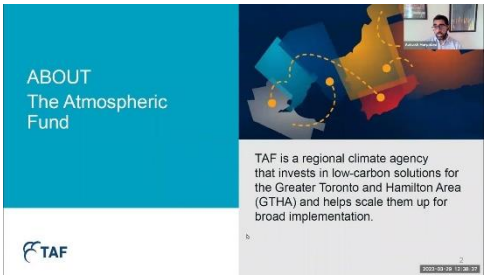
Winfield, M., "The environment, climate change and market populist politics" in J.Malloy ed., *Government and Politics of Ontario* (6th edition), Forthcoming University of Toronto Press, for publication 2023.

Winfield, M.nd Kaiser, K., "Ontario and Climate Change," for J. Onusko and D. Anastakis, eds., *Ontario Since Confederation: A Reader* (Toronto: University of Toronto Press for publication 2022)

Winfield, M., and Whitmore, J., "Energy productivity first. Then focus on production." *Policy Options* April 24, 2023

March 14, 2023 Webinar regarding TAF Net Zero Study

https://www.youtube.com/watch?v=PRjYQFuJIKw



The SEI at the EUC Presents: Net Zero Electricity Options for Ontario

Wednesday March 29, 2023 12:30-2PMLast fall the The Atmospheric Fund (TAF) released a study examining options for a net-zero electricity system for Ontario b...

www.youtube.com

Electricity Policy (General)

Winfield, M., and Dolter, B., "Energy, Economic and Environmental Discourses and their Policy Impact: The Case of Ontario's Green Energy and Green Economy Act." *Energy Policy* 68 (2014) 423-435.

Smart Grids, DERs, Energy Efficiency, Energy Storage and Community Energy Planning

Energy Storage

Winfield, M., Shokrzadeh, S., and Jones, A., "Energy Policy Regime Change and Advanced Energy Storage: A Comparative Analysis," *Energy Policy, Volume 115, April 2018, Pages 572-583.*

Smart Grids

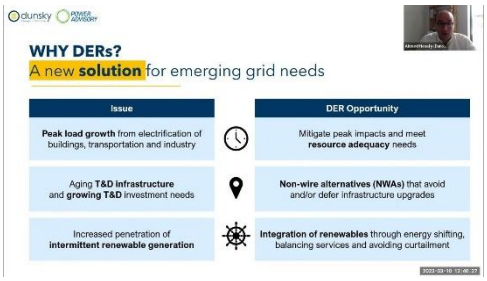
Winfield, M., and Weiler, S., "Institutional diversity, policy niches, and smart grids: A review of the evolution of Smart Grid policy and practice in Ontario, Canada," *Renewable and Sustainable Energy Reviews vol. 82(P2), pages 1931-1938.* (2018)

DERs

Winfield, M., and Gelfant G., “Distributed Energy Resource Development in Ontario: A socio-technical transition in progress?” *Energy Regulation Quarterly*, January 2020 - Volume 7, Issue 4, 2019.

March 29, 2023 Webinar on DERs

https://www.youtube.com/watch?v=oHV-AC1i0tw



The SEI at EUC Presents: Assessing the Potential for Distributed Energy Resources (DERs) in Ontario

York University Faculty of Environmental & Urban Change, Sustainable Energy Initiative Webinar: Assessing the Potential for Distributed Energy Resources (DER...

www.youtube.com

Energy Efficiency

B.Haley, Gaede, J., Love., P. and Winfield M., “From utility demand side management to low-carbon transitions: Opportunities and challenges for energy efficiency governance in a new era,” *Energy Research and Social Science*, Volume 59, January 2020, 101312**.**

Winfield, M., Love, P., Gaede, J., and Harbinson, S., Unpacking the Climate Potential of Energy Efficiency: Effective and Resilient Governance for Energy Efficiency in Low-Carbon Sustainable Energy Transitions (Toronto: Sustainable Energy Initiative, York University, 2020) .

Community Energy Planning

Winfield, M., Wyse, Susan M., and Harbinson, S., “Enabling community energy planning? Polycentricity, governance frameworks, and community energy planning in Canada,” *Canadian Planning and Policy Journal* Volume 2021, June 2021.

April 14, 2023 Energy Modelling Webinar

https://www.youtube.com/watch?v=c52sEZQGvn4

[The SEI at EUC Presents: Zero-Emissions Electricity Across Canada by 2035](www.youtube.com)

Madeleine McPherson, Assistant Professor in the department of Civil Engineering at the University of Victoria, and a founding Executive Member of the Energy ...

www.youtube.com

Non-Refereed Articles

Winfield, M., Ontario's deepening hydro mess," *Policy Options*, August 8, 2022.

Winfield, M., and Kaiser K, "What is clean electricity?," *Policy Options, January 27, 2022*

Winfield, M., "Fixing Ontario's Hydro Mess," *Policy Options* January 15, 2021.

Winfield, M., "Ontario's hydro: Some unwelcome truths," *Policy Options*, May 23, 2018.

Winfield, M., "The pitfalls of short-circuited project reviews, *Policy Options*, January 18, 2018.

Forthcoming:

Winfield, M., "Finding Pathways out of Ontario's Hydro and Climate Mess" (May 2023)

https://marksw.blog.yorku.ca/2023/05/04/finding-pathways-out-of-ontarios-hydro-and-climate-mess/

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May 23, 2023

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Cc: P2Dconsultation.ontario.ca
Peter Tabuns, M.P.P., NDP Energy Critic
Mike Schreiner, M.P.P., Green Party Leader
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