The Bowman Centre
For Sustainable Energy

Landuse Limitation impact on Wind Generation Capacity in Pathways to Decarbonization(P2D) Report

RESPONSE FOCUS

The focus of this feedback is on the stated modelling premise with respect to wind power:

> *Onshore wind was capped at 15,800 MW, limited by site quality, regulatory requirements and distance to transmission infrastructure.* (IESO P2D, page 12)

This limitation will impact the resultant energy mix and will skew the Moratorium result towards a solution with a high dependency on the nuclear and natural gas options. A recent Power Advisory report states that:

> *Ontario is blessed with a significant land area compared with many other jurisdictions.* (Power Advisory LLC, Scenarios for a Net-Zero, Electricity System in Ontario, November 2022, page 22)

The development of new energy resources in this significant land area, especially in the area of the 'Ring of Fire', would unleash both Ontario's untapped mineral resources and vast hydroelectric power resources, even though the large majority of this land area is located away from the southern reaches of the province where increased energy demand is anticipated. The P2D document states that an area equal to "14 Torontos" will be required for development – and while this area appears large when placed in the south of the province, it is more than reasonable in the vast undeveloped north of Ontario (see maps included below). Countries with much less developable land area than Ontario have managed to increase their renewable energy production percentages to much higher levels than the IESO report shows us attaining by 2050. (See table included below.)

This northern development would support Ontario's *Critical Mineral Strategy,* helping to provide materials required for the growing low carbon economy.

It would also tap into the 4,000MW of hydroelectric potential identified in the Ontario Power Generation 'Made-in-Ontario northern hydroelectric opportunities' 2022 report along with even higher quantities of other forms of renewable energy – especially wind power, which is both proven and cheap. This will require streamlining the land use and

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siting regulations for both transmission corridor and power source development to allow for quicker implementation of these needed resources.

Strengthening relationships with Indigenous partners is critical to successfully increasing Ontario's international competitiveness by transitioning to a low carbon economy, Indigenous communities are located across the whole of this development area and we must ensure their needs, along with the needs of the province and country, are met.

Finally, limiting the amount of wind energy production, while stating that 'offshore wind' could be made available, effectively eliminated that potential wind energy source from being pursued in the model. There is great potential for this form of highly economic wind energy in the power-hungry south of the province and even the northern reaches could be an area for this form of 'new' energy development.

In conclusion, while recognizing the need for a mix of energy resources including new nuclear, in limiting the amount of wind power in the analysis, the resultant mix is out of line with other areas, even those with significantly greater true land restrictions (see table below). Making the transition to the growing low carbon economy will require visionary leadership, and bold actions. There must be a willingness to bring development to a part of the province that has been greatly underserved in energy and other resources. While as well having the courage to develop a whole new (to Ontario) form of renewable wind energy in the south of the province where the demand is highest.

Thank you for allowing the Bowman Centre for Sustainable Energy to respond to the IESO P2D document.

Energy Mix – today (Denmark / Germany) and 2050 Ontario

Fuel Type	P2D Production 2050	%age P2D 2050	%age Denmark 2021	%age Germany 2022
Nuclear	24,825	37%	0	2%
Hydroelectric	7,727	11%	1%	3%
Wind	8,860	13%	49%	32%
Solar	12	1%	4%	32%
Bioenergy	37	1%	21%	5%
Natural Gas-> H2	14,250	21%	6%	15%
Other		17%	19%	13%

Maps - Available Land in Ontario and Denmark