ONTARIO NEEDS BETTER PLANNING TO AVOID AN ELECTRICITY SYSTEM CRISIS

Power Workers' Union, April 2024

The PWU is launching a series of papers to prompt discussion on better ways for Ontario to meet its growing electricity demand in a lower cost, lower carbon, and more reliable, affordable and timely manner.

POWER WORKERS' UNION

The People Who Help Keep The Lights ON.

INTRODUCTION

The evident, worsening consequences of climate change is creating a global consensus on the urgent need to achieve a net zero economy by 2050. Electrification of the economy, including the creation of a low-carbon electricity grid, is universally considered to be a critical prerequisite for achieving net zero. The Power Workers' Union (PWU) believes that Ontario's current planning approach to the province's electricity system is one of the major barriers that must be addressed. Ontario's current approach focuses on the near-term with "just in time" solutions that are based on flawed modelling, incomplete forecast analyses, and that require overly complex and costly system integration. As a result, Ontarians will be unnecessarily exposed to both significant reliability threats, i.e., increasing likelihood of brownouts and affordability risks.[1]

A Recognized Need for More Low-Carbon Electricity

Ontario's *Powering Ontario's Growth (POG)* report laid out a pathway to ensure Ontario has the energy needed to power economic growth and electrification over the next three decades while maintaining its clean electricity advantage. Ontarians are increasingly recognizing that the transition to an affordable and reliable net zero energy system is a significant undertaking and that achieving this outcome has become more urgent. For example, the 2023 theme at the Ontario Energy Association/Association of Power Producers of Ontario's (OEA/APPrO) conference was *Taking Action: Driving Ontario's Energy Transition*. There was an evident consensus among the attendees that Ontario has enough information to start deciding on known technologies given the rapidly emerging supply gap. Also evident was the shared consensus that it will be better for Ontario to overshoot its capacity needs rather than face reliability risks caused by supply shortages.

The Growing Risk of Brownouts

However, these shared concerns directly clash with the more conservative approach recently expressed by Ontario's Independent Electricity System Operator (IESO) to keep Ontario's "*options open without getting ahead of demand*". [2] The PWU believes that this conservative view has resulted in the IESO under-forecasting demand, underestimating the required infrastructure build and the lead time that it would require, and not procuring enough supply. With this approach, several independent analyses suggest that Ontario will experience brownouts before the end of this decade.[3]

Ontario urgently needs to accelerate building the scale of low-carbon infrastructure on a timeline that meets the province's long-term resource requirements. The POG and the recent Electrification and Energy Transition Panel (EETP) report lay out strategic imperatives for proactively planning Ontario's electricity system which are not being adequately addressed by the IESO's annual planning and resource acquisition approach.

[1] PWU submissions to the MENDM, 2021, IESO Preliminary APO Jan 2024, and IESO LT2 RFP Jan 2024.
[2] Keynote address by L. Gallinger, CEO of the IESO, at the Ontario Energy Network (OEN) February 2024.
[3] Strategic Policy Economics, Electrification Pathways for Ontario, 2021.

THE GOVERNMENT HAS DIRECTED ACTIONS TO POWER ONTARIO'S GROWTH

In 2021, the IESO, at the direction of the government, developed its *Pathways to Decarbonization Report (P2D), the findings of which were embraced by* Ontario's *POG* report. The *POG* report emphasized the need for Ontario to address an anticipated greater than doubling of Ontario's electricity demand by 2050 amidst the concurrent retirement of 20 GW of supply. The Minister of Energy stated that the POG "*lays out the plan to provide … the reliable, low-cost, and clean power we need to power Ontario's growth*." The Minister further stated that "*in the near-term natural gas generation will continue to … to maintain system reliability and support electrification across our economy.*"

The *POG* outlined several actions to secure Ontario's energy future including many to enable and advance long-lead time, low-carbon, long-life electricity system assets, which the Ministry directed the IESO to act on:[4]

MINISTRY OF ENERGY DIRECTED ACTIONS IN POWERING ONTARIO'S GROWTH REPORT	
Long Lead Asset Development	**Initiatives for Reliability Risk Mitigation**
Advance new nuclear • **Pre-development work on SMRs at Darlington, large scale nuclear at Bruce, and of refurbishing Pickering** • **Assess potential future nuclear generation facilities to meet P2D forecast demand** **Designing future competitive procurements for:** • **Resources with long lead times and long lifespans, such as long-duration storage, and hydroelectric generation;** • **Commercial options for new nuclear generation** **Planning for the transmission required to support the POG-identified generation projects, including new nuclear and hydroelectric opportunities;** **Addressing known transmission bottlenecks between northern and southern Ontario and within the Greater Toronto Area to unlock opportunities for new nuclear and hydroelectric.**	Designing future competitive procurements for new clean resources including wind, solar, hydroelectric, storage and bioenergy. Supporting the development of local markets for distributed energy resources (DERs) Support a future energy efficiency framework and path forward for Conservation and Demand Management (CDM) programming post-2024. Accelerating the development of new transmission infrastructure in Northern Ontario, the Ottawa Region and Eastern Ontario

The PWU contends that the IESO's approach to resource adequacy will not facilitate these options without additional proactive government direction and, in fact, impedes making these infrastructure decisions.

THE EETP RECOMMENDED A MORE PROACTIVE AND ACCOUNTABLE APPROACH TO ENERGY TRANSITION PLANNING

The EETP laid out a context and qualitative narrative for Ontario's decision-makers emphasizing the need for proactive actions necessary to achieve a NZ economy. Much of the

[4] Minister of Energy Letter to the IESO, Jul 10, 2023.

EETP's narrative aligns with PWU recommendations provided in 2021 to the Ontario Ministry of Energy and Northern Development and Mines (MENDM).[5]

The EETP characterized the challenge as a "*multi-decade social, economic, and political process*" that requires "*Establishing a government-wide commitment to develop a clean energy economy by 2050*." To this end, the EETP report not only identified the need for integrated energy planning but that a: "*transformed planning process will deliver certainty and predictability to align actors across the energy sector*" and not stray from the *"imperative to ensure an affordable and reliable supply of energy."*

The EETP also suggested that "*when planning and making decisions, government and all sector entities should justify how current decisions align with the long-term commitment to a clean energy economy by 2050*." The EETP report additionally states that*: "government must put in place robust governance and accountability mechanisms that encourage iterative planning, measurement, verification and tracking of progress*." To this point, the PWU has repeatedly noted the absence of cost accountability in Ontario's energy planning process.

As such, the PWU applauds the EETP's recommendation that the OEB provide a regular procedural review of IESO-led planning and procurement as an additional accountability mechanism.

The EETP report advised that navigating the energy transition *"requires strategic foresight"* and *"perhaps most importantly, a long-term perspective to maximize policy clarity in line with long-term investment cycles*."

Most importantly, the EETP report stated that: "*the risk-return balance between proactive build-out of energy infrastructure and reactive energy planning has shifted. Energy planning must work proactively to ensure that adequate, affordable, and reliable supply is available in a timely manner ….*" The EETP emphasizes the importance of shifting to a more proactive planning regime as *"A key factor in attracting investment and enabling economic development is access to energy where and when it is needed*." This shift towards proactive planning is consistent with the themes of the OEA/APPrO conference discussions mentioned earlier and is in stark contrast to the IESO's approach.

Unfortunately, the EETP report does not specifically define the:

- Steps and reforms that could enable the urgent action that the EETP calls for;
- Criteria to guide decision-making during the process; nor,
- Demand growth and inherent risks presented by the pace of electrification and guidance for securing reliability and affordability.

The PWU contends that the short-term planning horizon inherent in the IESO's Resource Adequacy Framework[6] and conservative demand forecasting not only puts Ontario at risk of losing its status as a low carbon electricity system, but even more importantly, at risk of sustained energy shortages.

[5] PWU submission to the MENDM, May, 2021; Green Ribbon Panel, 2021.
[6] Comments made during the March 21 IESO Strategic Advisory Committee (SAC) meeting.

AT ODDS WITH THE POG/EETP, IESO'S CONSERVATIVE AND LEGACY PRACTICES ARE EXPOSING ONTARIO TO RISK

The IESO's conservative, not proactive, approach to planning and its focus on making use of its ill-matched administered markets mechanisms are introducing reliability, affordability and deliverability risks.

Reliability Risks

Even though its *P2D* report has informed the *POG* report, the IESO insists it was just an analysis and is not using it to inform its electricity planning efforts. In contrast, the IESO's 2024 Annual Power Outlook (APO) provides a conservatively low demand forecast for Ontario. In fact, since 2013 the IESO's conservative approach to demand forecasting has led it to successively realize greater and greater capacity risks for the 2030-2035 timeframe, while losing time to develop the necessary assets, as shown in Figure 1. This trend can be expected to continue as the IESO's demand forecast remains below the consensus opinion of the needs resulting from decarbonizing the economy as shown in Figure 2.[7] For example, the IESO's 2024 APO, which underpins its current planned procurement activities, does not consider the large impact of heating electrification. Ignoring such factors complicates and delays the procurement of the resources Ontario needs. In several submissions to the IESO, the PWU has recommended that the IESO undertake a risk informed forecast and resource planning and procurement approach that will consider higher electricity demand drivers.

This would better address the recent findings of Ontario's EETP and, more specifically, its recommendation regarding "timely, available supply".

Figure 1 - Trend in IESO 2030/35 Capacity Gap Forecast
GW Peak Assuming All Existing Resources are Renewed

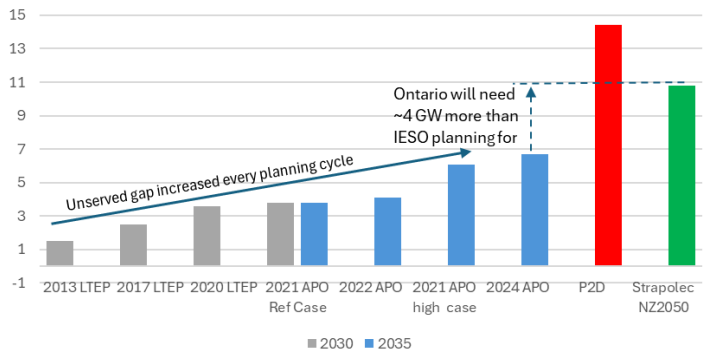
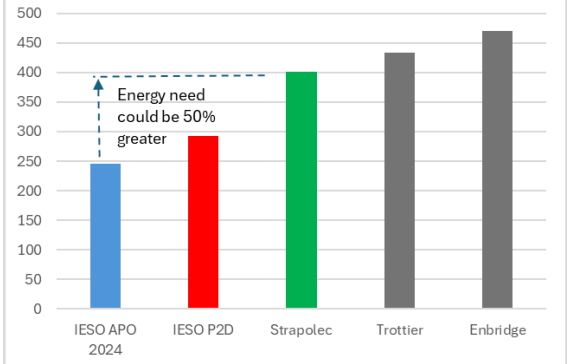


Figure 2 - Ontario Electricity Demand
Net Zero 2050 Estimates (TWh)



The PWU has also noted that the IESO's procurement approach inadequately matches supply to demand and will under-procure in meeting its own forecast.[8] These observed risks are now acknowledged in the IESO's 2024 APO which further indicates that the mitigation may be the life extension of Ontario's cost-regulated Lennox thermal generating station.

[7] Sources for Ontario demand in a Net Zero economy include: Strategic Policy Economics (Strapolec), "Electrification Pathways for Ontario", 2021; Institute de L'energie Trottier, "Horizon 2060, Canadian Energy Outlook", 2021 (Trottier); and, Guidehouse for Enbridge Gas, "Pathways To Net Zero Emissions For Ontario", 2022 (Enbridge). These differ primarily with hydrogen assumptions. The P2D report assumed no electrolytic hydrogen production in Ontario.

[8] PWU submission to IESO on its LT2 RFP, Jan 2024. IESO published expedited LT RFP results, Sept 2024.

The PWU agrees with this contingency but further notes that it acknowledges how the IESO's market-based procurement approach has not and will not meet Ontario's needs and will require government directives to compensate for that failure.[9]

Affordability Risks

The IESO's current procurement approach creates several unmitigated affordability risks. Many key Ontario energy stakeholders have advised the IESO that its markets-based approach for the procurement of long-term, low-carbon energy resources presents unnecessary risks and includes poorly designed cost evaluation criteria.[10] In spite of these valid criticisms, the IESO has asked the Ontario government to approve its approach. Multiple PWU submissions to the IESO have consistently advised that procuring intermittent supplies based on levelized costs absent market impacts could result in supply mix outcomes at three times the costs, including unanticipated stranded costs. Additionally, the IESO's proposed procurement criteria do not capture the significant socio-economic and energy security implications for taxpayers. This ignores the EETP's recommendation regarding the need to balance the roles of ratepayers and taxpayers.

Many stakeholders, such as municipal councils, have also expressed concerns about other risks associated with the IESO's procurement approach, particularly as it relates to new gas-fired generation and even the storage alternative. The IESO may be overly relying on developers to advance public engagement while the EETP has recommended improved integrated planning.

Deliverability Risks

Meeting Ontario's electricity needs requires decision-making and investments from multiple players – government, local community, indigenous people and the electricity sector, including distributors, transmitters and generators. The IESO's regional planning process has been bringing these players together. However, the IESO's regional and bulk system planning processes are several years out of synch with their own APO demand forecasts. This misalignment creates risks that are evidenced in the IESO's recurring annual upward adjustments to its long-term demand forecast. These misalignments predictably undermine the multi-year bulk system studies that must address Ontario's delivery development challenge and the policy imperative to manage Ontario's "transition off natural gas". The consequence is inadequate guidance for the development of the delivery infrastructure needed to power Ontario's growth and the alternatives to mitigate the associated risks.

A PREVENTABLE SUPPLY CRISIS - ADVANCING ONTARIO'S POLICY AND PLANNING GAPS TO ACHIEVE NZ BY 2050

Ontario's current approach to planning and procuring critical long-term, low-carbon electricity resources needs significant changes and additional policy direction. The above noted risks are evident and pressing. The PWU will be releasing three papers in the coming months to

[9] An assessment of Ontario's electricity market structure and how they are ill-suited to procuring the non-emitting resources the provinces needs is provided in the Strategic Policy Economics 2019 report, "Electricity Markets in Ontario".
[10] IESO LT2 RFP webinar, Feb 2024.

broaden the discussion of the improvements required to Ontario's approach to system planning and to shed light on alternatives to risk mitigation and the accelerated decision-making required to secure new reliable and affordable, low-carbon, long-life energy assets.

The first paper in the series of three will further explore the identified reliability risks and mitigation options, including: high fidelity temporal modeling for identifying viable supply mix options; implications of interjurisdictional interconnections; available processes to optimize resource development timelines; and, acceleration of the development of reliable long-lived low-carbon assets.

The second paper will explore the aforenoted affordability risks and explore others associated with accountability gaps, the efficacy of Ontario's IESO administered electricity markets, the IESO's timeline for procuring medium and long-term low-carbon resources, and the effectiveness of regional planning.

The final paper will examine the deliverability risks facing the above-mentioned Ontario's transmission and distribution systems development challenges, including the integrated delivery of electricity, natural gas and hydrogen. This will include the mitigation options for building out distribution and transmission system capacity required to meet the pace of electrification technology adoption, such as moderating demand growth and leveraging the value of behind the meter distributed energy resources (DERs) and rate programs.

CLOSING

For over seventy years, the men and women of the PWU have been critical to keeping the province's lights on. The PWU remains a strong supporter and advocate for the prudent and rational reform of Ontario's electricity sector and recognizes the importance of planning for low-cost, low-carbon energy solutions to enhance the competitiveness of Ontario's economy. The PWU has a successful track record working with other energy stakeholders to strengthen and modernize Ontario's electricity system. The PWU is committed to the following principles: Create opportunities for sustainable, high-pay, high-skill jobs; ensure reliable, affordable, environmentally responsible electricity; build economic growth for Ontario's communities; and, promote intelligent reform of Ontario's energy policy.