

Long-Term 2 RFP – December 13, 2023

Feedback Provided by:

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

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

Please submit feedback to <mailto:engagement@ieso.ca> by January 15, 2024. If you wish to provide confidential feedback, please mark "Confidential". Feedback that is not marked "Confidential" will be posted on the engagement webpage.

Resource Adequacy Framework and Cadenced Procurement Approach

Topic	Feedback
Do you have any comments or concerns regarding the cadenced nature between upcoming LT and MT RFPs?	
Do you have any comments or concerns regarding the proposed offering of both capacity style and new revenue model style of contracts, based on resource eligibility requirements and system needs?	
Do you have any concerns regarding the proposed target setting approach for upcoming MT RFPs?	
Do you have any comments regarding how best to employ bridging and extensions to contracts to facilitate the success of the Resource Adequacy Framework?	

LT2 RFP Resource Eligibility and Timelines

Topic	Feedback
Do you have any general feedback on resource eligibility and timelines?	
If the potential of repowering an existing facility applies to you, would you be interested in exploring this option further?	

Topic	Feedback
How should the optimal threshold for what constitutes a partial or fully repowered facility be determined and what considerations should be taken into account regarding the repowering of different resource types?	
What considerations should be taken into account for new-build DERs?	
Please express any interest and opportunities for uprates and/or expansions at any of your existing facilities.	

LT2 RFP Design Considerations – System Congestion and Deliverability Approach

Topic	Feedback
What early system congestion information do proponents need to guide them in choosing the location of their projects and when is this needed by within the procurement cycle?	
Do you have any general suggestions for how to approach deliverability evaluation in the LT2 RFP?	

LT2 RFP Design Considerations – General Feedback

Topic	Feedback
Do you have any comments regarding the impacts that agricultural land-use limitations may have on project development?	

Topic	Feedback
Do you have any comments regarding what evaluation criteria can be utilized to evaluate project readiness, given tight timelines and reliability needs?	
Do you have input on the proposed mechanism for valuing Indigenous participation?	
Are there any other rated criteria that should be considered?	

Long Lead Time Resources

Topic	Feedback
Does the proposed approach to enabling long-lead time resources enable meaningful participation or sufficient certainty?	
What additional considerations should the IESO contemplate for enabling broader participation from long-lead time resources?	

Revenue Model

Topic	Feedback
As a potential proponent, are you generally supportive of the proposed Enhanced PPA revenue model? Are there any other considerations that the IESO should look into further with regards to the revenue model?	

General Comments/Feedback

Thank you for the opportunity to offer Bedrock Energy's observations and recommendations on the IESO's LT2 procurement, arising from the IESO Webinar on December 13, 2023. Similar to the value of intervenors' contributions in OEB hearings, this solicitation of advice by the IESO from industry participants is smart, welcome and necessary. What the IESO does with it will be key to the LT2's implementation success, and beyond.

Ontario's power industry and the consuming public are facing a daunting, complex and rapid transition from the current ~40,000 MW electricity supply mix built over 125 years. The planned 25-year energy revolution to 88,000 MW in terms of rapidity, breadth and impact is and will be unprecedented. The province does not exist in a vacuum however, and must reconcile with not being the only jurisdiction to embark on such an ambitious expansion; between now and 2050, increasingly fierce competition for various resources critical to these electrification objectives will pose further challenges if we postpone the bulk of expansion to later decades.

Drivers of and assumptions underlying this transition have never been tackled before on this scale nor at this speed; the horizon outcome is forecast, and frankly far from known with a reliable degree of predictability and certainty. With electricity now societally defined as an essential service, there is no tolerance for avoidable supply mistakes.

New technologies, for example, especially hydrogen at serious scale (18,000 MW), are heralded in the IESO's 2022 *Pathways to Decarbonization Report* to form a major, flexible component of the supply mix, but nobody on the planet has ever achieved this level of integration to replace fossil generation – at least not proven or yet. So, Bedrock suggests to the IESO that an abundance of caution and some supply insurance must be built into whatever scenario is ultimately adopted and implemented.

There is no luxury in wondering about Ontario being "power-long" as in the past, so 'let's go slowly...' is no answer. Given that NERC ranks Ontario in last place continentally (out of 20 ISO's) in terms of resource adequacy, there is a significant risk of Ontarians being caught power-short, if and when the transition accelerates due to consumer demand for air heat pumps and pending ICE powered autos unavailability post-2035. Most electricity infrastructure takes many, many years to plan, finance, permit and construct, so there are no magic bullets, and no time to waste in this energy transition, where there is an obvious risk of a supply gap between 2027 and 2035.

Our provincial grid transition into renewable energy is well underway. Renewables' inherent intermittency and non-reliable dispatchability (notwithstanding positive, dramatic cost reductions and efficiency progress) continues and can realistically be integrated and managed if they receive a companion complement of transmission and emissions-free energy storage, both long and short duration. The *Pathways Report* and the IESO's multi-year energy procurement plan of 5,000 MW during this decade underscores the need for firming up the renewable fleet now or at least concurrently. Bedrock submits that Ontario's renewables back-up strategy ought not to be achieved

by contracting only with short-term natural gas generation, especially when there are clean, economic alternatives presently commercially available.

Let's be transparent and candid. This IESO LT2 procurement follows multiple announcements starting in Q3 2021, when both the IESO and government of Ontario appear to have awakened to the supply 'cliff' Ontario's electricity ratepayers are all facing. Since that latent awakening, it is clear to many industry observers that the longer-horizon, announced expansion of nuclear power is likely prudent, and more recently, it is abundantly clear that several municipal councils – now armed with energy project vetoes – have spoken to deliver a resounding no to new gas generation, given the risks of impairing the health of their citizens and derailing their community emissions targets. This dynamic points to the IESO and the Ministry of Energy being smartly flexible to listen and re-think the Pathways plan in a couple of key respects.

Long-Duration Energy Storage is a Viable Substitute for Gas Generation

Bedrock is a solution-oriented company, which remains focussed on timely, concurrent opportunities that are economic and sustainable. Its Compressed Air Energy Storage ("CAES") projects are designed to supplement Ontario's renewable fleet and make it dispatchable, assist in eliminating wasted nuclear, hydraulic, solar and constrained-off wind power so that the entire system balances itself much more easily, economically and prudently. CAES more broadly can be understood as analogous to Pumped-Hydro Energy Storage ("PHES"), the form of Long Duration Energy Storage ("LDES") coveted by the IESO for its flexibility and longer output than typical chemical based batteries. At its core, LDES can effectively act as a stand-in for natural gas peaker plant operations, without the associated emissions.

Over the next decade, even if the province opts to pursue refurbishment over complete shutdown of the Pickering Generating Station, the electrical generation gap appears poised to be filled by gas at present, and is driving medium-term contracts for minor gas-plant expansions. In other words, IESO staff members realized that the power system would require back-up post-2026; CAES could achieve a substantially similar, technical, solution-oriented result as does natural gas on a practical power supply basis. Bedrock knows that this support can be undertaken with CAES, but the IESO has so far not paid sufficiently close attention to understanding how a CAES project would work in an Ontario Silurian pinnacle reef, as no technical review has been undertaken with Bedrock's proposed 500 MW peak Bayfield facility. Bedrock's USP application was filed in May 2023 and its geological application filed with the MNR in accordance with the July 2022 Porous Rock Regulation in December 2022. Unfortunately, neither the Ministry of Energy, nor the IESO, has taken any opportunity to review the CAES supply option seriously.

The simple fact is that gas generation, while functionally workable, is an emissions-causing generation source which can fill in the generation shortfalls and gaps in the supply mix but will set Ontario back in meeting its clean power objectives. The recent rejections of ~700 MW of proposed new gas generation by multiple local municipal councils ought to cause the IESO and the government to publicly reconsider alternative, available supply resources – not just the wind, solar, biogas and

small hydraulic supplies sought in LT2. The LT2 is an early correct pathway to allow for inclusion of additional, flexible, firm alternatives: long duration storage. Here is how that could work.

It is trite to say that gas generation is a reliable, in-fill power source, capable of starting in short timeframes. It is. But so is a charged, certified storage vessel such as a utility-scale CAES designed geological container with its proven mechanical surface equipment. The Ontario gas industry has successfully deployed geological pressurized natural gas storage to reliably balance its growing utility operations for 70 years, just as the same form of geological containers can be used reliably for CAES.

A CAES type of facility is just as capable as natural gas of resting in a stand-by mode, ready for full activation/dispatch within minutes, with an output duration range of 8, 12, even 72 hours (recognizing a declining power output curve). That is to say, a very flexible system asset.

Why has the IESO parked the LDES capacity in Ontario until the mid-2030s, 40s, 50s and limited their perspective and forecast to only 2000 MW? The reality is that grid-scale **LDES could be on-line by 2028** grid connected in approved locations to the 500 kV HONI system. Why not contract and build LDES concurrently with wind, solar, biogas and small hydraulic so that LDES is available when the next renewable fleets are commissioned and ready to perform to a 100% dispatch capacity? IESO ought to start considering intermittent generation and storage holistically, rather than one as a complementary afterthought to the other.

LDES capacity could be backing up newly procured renewables when commissioned and operating when the IESO needs it – instead of LDES waiting for gas to be backing all the renewables and clipping the peaks.

Bedrock has contemplated the IESO's 2030s+ delayed LDES scenario. Despite its own internal industry expertise and decades of executive power planning and facilities experience, Bedrock is genuinely unable to comprehend the Ministry's and IESO's thinking in terms of these delays and limitations. It is Bedrock's respectful submission that there is no risk and nothing but benefit to the IESO undertaking a technical review of CAES technology; the risk of not exploring the effectiveness of CAES technology for Ontario is throwing away opportunity.

Bedrock's CAES technology is a viable, economic, clean substitute for natural gas peaking, daily, and back-up generation. LDES should be added to the eligible LT2 procurement technologies.

During the LT2 Webinar, two large senior power industry players asked about whether storage would be a part of the procurement process. Bedrock is not alone; others are asking similar questions.

Bedrock recommends that the IESO and Government of Ontario's Ministry of Energy reconsider their planned deferral of LDES into the next decade when it should be apparent that there are LDES projects that are ready to compete with, and reduce reliance on, gas generation.