
Request for Information on Long Lead Time Resources: Long Duration Energy Storage

RFI Issued: August 27, 2024

RFI Closing Date: November 01, 2024



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1. Introduction

1.1 About the IESO

The Independent Electricity System Operator ("IESO") works at the heart of Ontario's power system – ensuring there is enough power to meet the province's energy needs in real time while also planning and securing energy for the future. It does this by:

- balancing the supply of and demand for electricity in Ontario and directing its flow across the province's transmission lines.
- planning for the province's medium- and long-term energy needs and securing clean sources of supply to meet those needs.
- overseeing the electricity wholesale market where the market price of electricity is set.
- fostering the development of a conservation culture in the province through programs such as saveONenergy.

The IESO is a not-for-profit corporate entity established under the Electricity Act, 1998. It is governed by an independent board of directors whose chair and directors are appointed by the Government of Ontario.

Please see the IESO's website at <http://www.ieso.ca> for further information.

1.2 Objective of the RFI

The IESO has initiated this Request for Information ("RFI") to gather information to better understand how long lead time resources can participate in current and future IESO procurements of electricity resources and contribute to a reliable and efficient electricity system in Ontario.

On July 10, 2023, the Minister of Energy issued a letter asking the IESO to, among others, design and report back on a potential "...procurement for resources with long lead times and long lifespans, such as long-duration storage and hydroelectric generation".

The purpose of the RFI is to solicit information and gain a broad understanding of proponents' experience in developing Long Duration Energy Storage (LDES) projects, and an understanding of the key risks and barriers that proponents expect to come across in developing LDES projects. The IESO may use this information and understanding to inform a future procurement related to long lead time resources.

Proponents interested in hydroelectric generation can refer to the accompanying RFI titled "REQUEST FOR INFORMATION ON LONG LEAD TIME RESOURCES (HYDROELECTRIC GENERATION)"

1.3 Background

The IESO’s 2024 Annual Planning Outlook (“APO”) forecasts that Ontario’s total electricity demand will increase by 60 per cent over the next 25 years. Continuing work to build a reliable, affordable and sustainable electricity system is critical to ensuring communities will flourish, businesses and industry have the confidence to invest, and the economy can decarbonize.

Under its Resource Adequacy Framework (the “Framework”), the IESO is taking a multi-pronged approach to meeting Ontario’s growing electricity needs and implementing the government’s Powering Ontario’s Growth plan. The Framework fosters competition while providing certainty, balancing risk between ratepayers and investors.

There are several mechanisms within the Framework, and together they provide the IESO with the flexibility to address its evolving needs while also recognizing the unique characteristics of different suppliers and resource types. Since its launch in 2021, the IESO has used the Framework to meet procurement targets, retain existing assets in a cost-effective manner, and attract new investment.

The main parts of the Framework are:

Mechanism	Scope
Capacity Auction	Balances fluctuations in capacity needs from one year to the next, and executed on an annual basis
Medium-Term Commitments	Provides resources greater certainty through longer forward periods and flexible 5-year commitments - cadenced process will provide IESO flexibility to adjust to changes in system needs and adapt processes to lessons learned
Long-Term Commitments	Secures resources with very long forward periods or commitments, such as new-build facilities
Programs	Meets electricity and policy objectives in a more targeted manner as directed
Bilateral Negotiations	Secures resources where a need exists that cannot be addressed in a practical and timely way through competitive processes (i.e. when needs are urgent and/or must be satisfied by supply in a specific location)

Between 2022 and 2024, IESO has concluded several initiatives to increase Ontario's electricity capacity. Across three initiatives, i.e., the Expedited Long-Term 1 RFP, the Same Technology Upgrades Solicitation, the First Long-Term RFP, the IESO has added 3,658 MW of new capacity, which puts Ontario's electricity system in a strong reliability position throughout the decade.

Several other initiatives are planned or underway to meet upcoming electricity needs:

- Small hydro-electric facilities can apply to the Small Hydro Program, which was launched to re-contract facilities with capacities up to 10 MW; contracts under the program will run through to 2043.
- The IESO will continue to run a series of cadenced medium-term RFPs every two to three years, with flexible five-year commitment periods in order to secure resources with expiring contracts. Engagements on the Medium-Term 2 Request for Proposals have begun for resources with contracts that expire between 2026-2029.
- The annual Capacity Auction – next scheduled for Q4 2024 – will target increasing amounts of capacity to meet reliability needs: 1,600 MW for the summer 2025 (up from 1,400 MW in 2024) and 1,000 MW for winter 2025/2026 (up from 850 MW in 2024/25).
- A 600 MW trade agreement with Hydro-Québec that will optimize the use of existing electricity generation capacity. Ontario and Quebec have excess capacity during the other province's electricity peak period that can be exchanged to reduce the need for new generation capacity.
- The IESO is conducting stakeholder engagement on designing the Northern Hydro Program, which is intended to re-contract existing hydroelectric facilities with capacities equal to or greater than 10 MW.

1.3.1 Long Lead Time Resource Procurement

With the first phase of the framework addressing needs this decade complete, the IESO is now developing the Second Long-Term RFP (LT2 RFP) which is looking to address electricity needs emerging in 2029 and through the early-2030s.

Additionally, the IESO is looking to design and develop a separate procurement for acquiring long lead time resources, approximately 500-1,000 MW, which would be in service by 2034. This could include hydroelectric generation, and LDES, which is the subject of this RFI.

1.4 Definitions

"LDES" means long lead time Long Duration Energy Storage

"MW" means Megawatts.

"Respondent" means an entity that submits a response to this RFI to the IESO.

"**RFI**" means this Request for Information.

"**RFI Coordinator**" means the IESO's authorized representative, and the Respondent's point of contact, for all purposes relating to this RFI.

"**Timetable**" means the schedule of key procedural dates and times relating to this RFI.

"**Toronto Time**" means Eastern Standard Time or Daylight-Saving Time as provided for in the Time Act of Ontario.

2. General Terms and Conditions

2.1 Eligibility

This RFI is open to all energy suppliers and developers of technologies that have the potential to provide LDES, specifically energy storage projects that have the capability to discharge at full capacity for a minimum of eight hours.

The proposed projects must be able to interconnect directly to the transmission or distribution system and be able to participate directly in IESO administered electricity markets as a registered market participant ($\geq 1\text{MW}$).

Eligible LDES technologies may include, but are not limited to, battery storage (e.g., flow,), thermal storage (e.g., cryogenic/liquid air, molten salt), mechanical storage (e.g., pumped hydroelectric), chemical storage (e.g., hydrogen).

Respondents should note that while Respondents may submit a response based on lithium-ion based technologies, LDES projects based on lithium-ion storage projects could be deemed ineligible to participate in a future procurement for long lead time resources.

This RFI should only be completed by a representative of the Respondent with specific knowledge of the subject-matter.

Proponents interested in hydroelectric generation can refer to the accompanying RFI titled "REQUEST FOR INFORMATION ON LONG LEAD TIME RESOURCES (HYDROELECTRIC GENERATION)"

2.2 Terms and Conditions

1. This RFI does not pre-qualify parties to respond to any subsequent RFP, nor has a date for any such RFP been set.
2. Responses to this RFI will not be used to evaluate any responses to a subsequent RFP.
3. This RFI is not a request for proposal or a tender call or any part of a process related to future procurement processes, if any. This RFI is not in any way intended to commit the IESO to any future procurement process, or to proceed to negotiate or award any contract, nor is it intended to bind the IESO in the design or administration of any such particular procurement process or plan.
4. This RFI is not intended to create, and should not be construed as creating, contractual or legal relations or entitlements between the IESO and any Respondent. In the event that any information that may be the subject matter of this RFI is the subject of any active legal procurement process being administered by the IESO or the terms of a current contract with the IESO, the terms and conditions of such legal procurement process or applicable contract shall govern.

5. Respondents are encouraged to respond to this RFI; however, failure to submit a response will not impact a Respondent's ability to respond to any future competitive solicitation process or influence the selection of a Respondent or bid proponent going forward or affect its rights and obligations under any applicable laws or in any legal proceeding.
6. The IESO reserves the right to reject any or all submissions; to amend or terminate this RFI process; and to retain all submissions.
7. Under no circumstance shall IESO be liable to any Respondent or potential respondent for any damage, however caused and under any theory of liability, arising in any way from this RFI. Without limiting the same, and for greater certainty, the IESO shall not be liable for any costs incurred by any Respondents in preparing any information for submission in connection with this RFI process or any and all costs resulting from responding to this RFI. Any and all such costs whatsoever shall remain the sole responsibility of the Respondent.

2.3 Confidentiality; FIPPA

The Respondent consents to the IESO's collection of information as contemplated under this RFI for the uses contemplated hereunder. The Respondent further consents to the disclosure of its RFI submission to the Ministry of Energy and Electrification, including any confidential information, which will be shared with the Ministry of Energy and Electrification under confidentiality agreement with the IESO.

Respondents are advised that the IESO does not intend to publish individual responses, however, the IESO reserves the right to post anonymized and aggregated results from the RFI, and the Respondent further consents to same.

The Respondent also acknowledges that the Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c.F.31 ("FIPPA"), as amended, applies to information provided to the IESO by a Respondent. In providing its response to this RFI, the Respondent acknowledges that its response may be disclosed by the IESO where the IESO is obligated to do so under FIPPA, by an order of a court or tribunal (or other administrative body) or pursuant to a legal proceeding.

A Respondent should clearly identify any information in its response or any accompanying or supplemental documentation which is supplied in confidence and for which confidentiality is to be maintained by the IESO. Where the Respondent is providing information in confidence, the word "Confidential" should precede the specific response. The confidentiality of such information will be maintained by the IESO, except as set out above in this section 2.2.

3. Submission and Communication Instructions

3.1 Submission Instructions

Respondents should submit all documents electronically to the IESO at resourceadequacy.rfi@ieso.ca, by the RFI submission deadline of **November 01, 2024**. The IESO will only be accepting electronic submissions and in the interest of limiting administrative effort, electronic submissions should reference the Respondent's name and RFI – Long Lead Time Resources (Long Duration Energy Storage)

Email: resourceadequacy.rfi@ieso.ca

Subject: "Name of Respondent" RFI – Long Lead Time Resources (Long Duration Energy Storage)

The submissions should contain the Respondent's full name and address and should include the main contact information of the Respondent. The submissions shall be in English only.

The IESO may request additional information in relation to a response after the submission deadline. Additionally, the IESO may request to meet with select Respondents to further discuss their response.

3.2 Multiple Facilities/ Technology Types

If a Respondent wishes to provide information about multiple configurations/locations for the same project, the Respondent should do so within a single submission, as opposed to multiple submissions.

If a Respondent wishes to provide information about different projects, the Respondent should only provide information about one project in a single submission. The Respondent may submit multiple submissions, each corresponding to a separate LDES project.

3.3 Communicating with the IESO

Unless specifically stated otherwise elsewhere in this RFI, all communications relating to this RFI shall be addressed to the RFI Coordinator in writing by e-mail to resourceadequacy.rfi@ieso.ca.

3.4 Questions, Clarifications, Discrepancies

1. The Respondent may direct questions or seek additional information in writing by e-mail to resourceadequacy.rfi@ieso.ca prior to the deadline for submitting questions to the RFI Coordinator.

2. Notwithstanding the foregoing, the IESO is under no obligation to provide additional information or clarification.

3.5 RFI Timetable

ACTIVITIES	TIMELINES
RFI release date	August 27, 2024
Respondent's deadline for submitting questions	October 04, 2024
RFI Closing Date (Respondent's deadline for submitting an Information Package)	November 01, 2024

The IESO may amend the Timetable from time to time in its sole discretion.

4. Requested Information

A. Contact Information

1. Respondent Name
2. Contact Details (Representative Name, Position, Email)
3. Project Name/ID

B. Technology Information

1. Please provide a description of the company's/project's energy storage technology. Please include information on key parameters of the technology including:
 - a. round-trip efficiency
 - b. cycling limitations
 - c. maximum and minimum state of charge levels
 - d. annual and/or lifetime degradation
 - e. expected lifetime of the asset
 - f. Expected timeline for development etc.
2. Are there any locational constraints associated with this technology (e.g., requirement to be situated on/near a particular geography or a resource like water)? Please provide information on technology specific constraints. Information on project-specific constraints can be provided in the next section of the RFI.
3. Are there any environmental considerations associated with the installation, operation, and decommissioning of this technology? Please provide information on technology specific considerations. Information on project-specific considerations can be provided in the next section of the RFI.
4. Has this technology been deployed on a commercial scale? If yes, please provide details on the scale of its deployment, examples, and any other associated information that you may wish to provide. If no, please skip to Question 5.

- a. Has your company successfully deployed this technology on a commercial scale in Canada or rest of the world? If yes, please provide details.
5. Has this technology been deployed on a non-commercial scale, such as through pilot or demonstration projects? If yes, please provide details and examples. If no, please skip to Question 6.
 - a. Has your company successfully deployed this technology on a non-commercial scale in Canada or rest of the world? If yes, please provide details.
6. If this technology has not been deployed on a non-commercial scale, how can IESO rely on a project based on this technology to successfully operate in IESO-administered markets and contribute towards meeting Ontario's forecasted electricity needs.

C. Project Information

1. Please share any indicative information that you can about your proposed project, including:
 - i. Installed capacity (MW)
 - ii. Maximum storage duration (hours)
 - iii. round-trip efficiency (%)
 - iv. cycling limitations (# of cycles)
 - v. maximum and minimum state of charge levels
 - vi. Ramp rate (MW/min)
 - vii. Ability to providing Operating Reserve, Frequency Regulation, Voltage Support, Inertial Response
 - viii. Annual and/or lifetime degradation etc. (%/year)
 - ix. Expected lifetime of the project (years)
 - x. Project development timelines
2. How does your project meet Ontario's electricity needs that have been identified by IESO in the 2024 Annual Planning Outlook?
3. Have you identified one/multiple sites that are best suited for your project? If yes, please provide any details that you can share on the locations, the rationale for selecting these locations, and if the different locations have any impact on the project design/complexity.

4. If you are aware of the connection point at which your project would connect to the IESO's transmission grid, please provide this information for each identified site.
5. If your project requires development of new transmission infrastructure, are you aware of other expected loads or generation sources that could be connected to this infrastructure?
6. Please describe your past experience with the development of a project based on this technology, including your experience in securing site(s), obtaining permits, financing, construction, etc.
7. Will this project have equity ownership from an Indigenous community? Please provide further details on level of intended equity ownership and on any other form of partnerships with Indigenous communities.
8. Please provide details on any engagement that you have carried out with Indigenous communities and local communities on this project.
9. Please provide details on any expected environmental impacts and/or land use considerations from the development, construction, operation, and decommissioning of your project.
10. Please describe the expected supply chain for your project.
 - i. Which components are hardest to procure, and what is your plan to ensure supply?
 - ii. Are there any components that are able to be procured from within Ontario or within Canada?
11. Please provide details on other key risks associated with the development and operation of your project and how you intend to manage those risks.
12. Please describe the financing needs for development, construction, operation and decommissioning of your project.

13. Please share details on sources of concessional finance such as grants, tax credits, preferential loans etc. that you intend to utilize for this project.

14. Is there any additional information you would like to share as part of this submission?

**Independent Electricity
System Operator**

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