



# Assessment of Opportunities Offered by the IESO Energy Storage Request for Proposal

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# The IESO has issued an RFP for 35 MW of Energy Storage projects providing regulation and reactive support and voltage control services

- The IESO's RFP indicates that it is looking to contract for the "broadest range of technologies" that can provide these Ancillary Services.
- There are four mutually exclusive project Envelopes, which are defined in terms of geographic areas, congestion, and whether there is a transmission or distribution connection.
  - ✓ Project Envelope 1: Transmission Connected in Uncongested Areas – Southern Ontario:
    - Up to 35 MW, with a minimum project capacity of 2 MW, excluding various sub-regions.
  - ✓ Project Envelope 2: Transmission Connected in Uncongested Areas – Northern Ontario:
    - Up to 7 MW, with a minimum project capacity of 2 MW, excluding various circuits and providing reactive support and voltage control.
  - ✓ Project Envelope 3: Transmission Connected in Congested Areas
    - Up to 7 MW, with a minimum project capacity of 2 MW, located on the load side of the interface.
  - ✓ Project Envelope 4: Distribution Connected
    - Up to 7 MW, with a minimum project capacity of 0.5 MW in various areas.
- Individual project capacity cannot exceed 10 MW.
- The maximum contract term is 10 years, but the length of the contract term is an element of the evaluation process.
- The proposed Contract Development Duration cannot exceed 30 months.

The IESO's schedule for the RFP is shown below. It is aggressive.

- There is a briefing session March 24<sup>th</sup>
- Respondents are required to submit an Intent to Participate Form and Non-Disclosure Agreement by April 22<sup>nd</sup>
- Proposals are due April 28<sup>th</sup>.
- Preferred Respondents are to be selected by June 1<sup>st</sup>

RFP release date	March 12, 2014
Deadline for registration for Briefing Session	3:00 pm March 20, 2014
Briefing Session	March 24, 2014
Respondent's deadline for submitting questions	3:00 pm April 10, 2014
IESO deadline for issuing Addenda and Definitive Contracts	April 17, 2014
Respondent's deadline for submitting Intent to Participate Form and Non-Disclosure Agreement (if not previously submitted)	3:00 pm April 22, 2014
RFP Closing Date (Respondent's deadline for submitting a Proposal)	3:00 pm April 28, 2014
Anticipated selection of Preferred Respondents	June 1, 2014
Anticipated Contract Effective Date	June 30, 2014

The IESO's Evaluation Criteria are shown below.

Evaluation Criteria		Maximum Score
M(1)	Mandatory Submission Requirements	Pass/Fail
M(2)	Mandatory Technical Requirements	Pass/Fail
<b>A</b>	<b>Technical Evaluation</b>	<b>40</b>
	1. Response Time	8
	2. Availability	8
	3. Ramping Capability	6
	4. Conversion Losses	10
	5. Storage Losses	8
<b>Minimum Technical Evaluation Threshold</b>		<b>15 out of 40</b>
<b>B</b>	<b>Contract Service Term Evaluation</b>	<b>20</b>
	Contract Service Term	20
<b>C</b>	<b>Price Evaluation (Proposed Contract Price offered to IESO)</b>	<b>40</b>
	1. Proposed Capacity Price	20
	2. Proposed Storage Price	20
<b>Total Available Score per Proposal</b>		<b>100</b>

## The Evaluation Criteria consider:

- **Response Time:** the Facility's ability to follow the IESO signals at any time without the need for advance notification. Facilities with response times of 4 seconds or less get the full 8 points.
- **Availability:** the amount of time that the Facility is available to provide contracted services. Facilities with availabilities of 98% or greater receive the full 8 points.
- **Ramping Capability:** the Facility's ability to consistently ramp up or down at any charge level, over their entire registered range. Facilities with a ramp rate of 50 MW/minute will receive the full 6 points.
- **Conversion Losses:** the Facility's conversion losses expressed as a percentage of the total energy stored assuming that a full charge cycle is immediately followed by a full discharge cycle. Facilities with conversion losses of 10% or lower will receive the full 10 points.
- **Storage Losses:** the Facility's storage (i.e., holding a full charge) losses, based on 2, 12, and 16 hours. Facility's with storage losses of 1% or lower will receive the full score.
- **Contract Service Term:** the proposed Contract Service Term will be scored, with 3 year terms receiving a score of 20, more than 3 year years up to and including 5 years receiving a score of 15, more than 5 years and up to and including 7 years receiving a score of 5, and greater than 7 years a score of 7.

## The Economic Evaluation focusses on Capacity Price (\$/kW) and Storage Price (\$/MWh).

- **Proposed Capacity Price:** The Proposed Capacity Price is the Contract Price divided by the capacity of the proposed Facility. Contract Price is the Total Fixed Payments, which is the total of the Monthly Fixed Payments over the Contract Term plus the Variable Payments which are the wholesale net energy related costs and distribution demand charges for distribution-connected projects.
  - ✓ The Contract Price and Proposed Capacity Price don't appear to consider the net present value of payments.
  - ✓ It isn't clear what assumptions will be made to derive Variable Payments.
- **Proposed Storage Price:** is Proposed Contract Price divided by the storage capability (MWh) of the proposed Facility expressed in \$/MWh. The Proposal with the lowest Proposed Storage Price will be awarded a score of 20.
  - ✓ Storage capability doesn't appear to be defined. It presumably considers the MWh storage capability that would be provided over the full term of the agreement.

## The Proposal selection seeks to promote technology diversity, while not violating the capacity or cost thresholds

- After all Proposals are evaluated they will be ranked by their cumulative score for each Envelope and the highest ranked Proposal in each Envelope will be selected. This is Round 1, envelope diversity.
- The highest ranked Proposal of the remaining Proposals will be selected provided that the Proposal : (1) doesn't duplicate the technology in the Envelope to which it has been offered; (2) would not exceed the maximum total MW threshold for Envelopes 2-4; (3) would not exceed the overall maximum capacity threshold of 35 MW; and (4) would not exceed the Overall Cost Threshold. The IESO will continue to select the next highest ranked Proposals until it is no longer possible to select a Proposal. This is the Technology Diversity round.
- If after the first two selection rounds the IESO has not met the overall maximum total capacity threshold of 35 MW and has not exceeded the Overall Cost Threshold then the IESO will conduct a third round irrespective of technology or Envelope if the Proposal would not exceed:
  - (i) the maximum total MW threshold in Envelopes 2-4;
  - (ii) the overall maximum total capacity threshold of 35 MW; and
  - (iii) the Overall Cost Threshold.
- ✓ The Overall Cost Threshold will not be disclosed.

## While the RFP seeks to promote technological diversity, the Envelopes are likely to favour technologies with the most favourable mix of characteristics

- ...as measured by the Evaluation Criteria. While technology diversity is a focus for Round 2, with a few dominant technologies, it is conceivable that just a few technologies could be selected.
  - ✓ Offsetting this could be the fact that battery technologies are likely to fair well under the RFP evaluation criteria and they have less significant economies of scale than other technologies, which reduces the incentive to size projects at the maximum allowed by the RFP and Envelope.
- Specifically, it is conceivable that a few technologies could secure a significant share of the total number of contracts. Therefore, Power Advisory believes that technology selection will be critical to project success.
  - ✓ Power Advisory is positioned to assist Proponents model different technologies and Proposal structures.
  - ✓ Power Advisory is also positioned to assist Proponents in technically determining how best to integrate and operate storage resources in the IESO-Administered Markets.
- The evaluation process isn't particularly transparent, making it harder for Proponents to evaluate tradeoffs between different Proposal configurations.
- Power Advisory believes that the short contract terms, the limited consideration of the number of discharge cycles may disadvantage flywheel technologies and favour batteries. Furthermore, it isn't clear that Ontario's existing regulation services market is well suited to the operating characteristics of flywheels and that the Evaluation Criteria sufficiently reward the discharge cycle capability of flywheels relative to their cost premium.



## Power Advisory offers extensive relevant experience.

- Team members have extensive experience with RFP processes, with involvement in over 30 major electricity resource RFPs, including extensive experience with Ontario procurement processes.
  - ✓ Team oversaw or assisted with the development of virtually all the Ontario Power Authority RFPs.
- We have extensive experience with the evaluation of energy storage technologies.
  - ✓ This includes advising a client in the IESO's previous energy storage RFP in 2011 for non-generation resources providing regulation services.
  - ✓ Assisting a client evaluate opportunities for structuring an energy storage project in Ontario.
  - ✓ Advising Natural Resources Canada on the economic and market barriers to the development of energy storage projects in the US and Canada.
  - ✓ Evaluating the economics of energy storage projects in Ontario and assessing how they would perform in Ontario's electricity market.
- Team members have extensive experience with integrating resources in the IESO-Administered Markets and the operation of these resources in the IESO-Administered Markets through our knowledge of market design and the IESO Market Rules, as team members helped design the IESO-Administered Markets and drafted many IESO Market Rules, therefore having excellent technical expertise and knowledge of how storage resources can best be integrated and operated