

August 31, 2016

## **Re: Enabling System Flexibility - IESO Stakeholder Engagement**

### **Introduction**

Thank you for the opportunity to contribute to the stakeholder engagement process on enabling system flexibility. Energy Storage Ontario (ESO) supports this important work and we appreciate the opportunity to contribute input on the potential of energy storage technologies to deliver greater system flexibility.

ESO is the voice of energy storage in Ontario -- a policy and advocacy organization that represents the broad range of companies engaged in the energy storage business in Ontario as well as outside the province. ESO is the only incorporated trade association in Canada focused on advancing the role of energy storage and building the market for the energy storage business. We are technology-neutral and represent companies that use a broad range of technologies. Our membership represents all players along the value chain -- technology providers, project developers, power generators, local electricity distribution companies, and NGOs.

Through networking, knowledge-sharing, advocacy and stakeholder education, we are helping to build a stronger industry and showcase the value that energy storage can bring to the system.

Ontario's energy storage industry has the unique ability to address not only the system's flexibility needs, but also a broad range of needs on the system, including:

- regulation services;
- provision of energy;
- surplus management and time-shifting generation;
- operating reserve;
- voltage support;
- distribution system and transmission system cost deferrals;
- optimize other generating resources including renewable, nuclear and gas.



## Energy Storage Role in Enabling System Flexibility

In Stakeholder Meeting #2, the IESO was specific in articulating its flexibility requirements.

This submission will list the requirements identified by the IESO and will highlight the capability of energy storage to respond to each requirement. In addition, we outline how energy storage solutions can address each of the IESO's principles for potential solutions. We also identify some principles that we believe should be included in the IESO's considerations.

### 1. Requirements Identified by IESO:

***“Available in real time that could provide power in 20-30 minutes, if called upon” (Workshop #2 - Slide 9).***

#### ***Energy Storage Ontario Response:***

- Energy storage technologies are well documented to be extremely fast response with full power provided within mere minutes, down to milliseconds. In looking at the value of flexibility, the IESO should attribute more value according to how quickly a solution can respond since faster response time invariably provides the IESO the ability to adjust almost instantaneously to address forecast issues.
- Energy storage technologies can also be flexible in terms of varying the level of output and input enabling controllable and predictable responses to changing system power requirements. Solutions can also be scalable to increase both the maximum output and the duration.

2. ***“Targeting about 1000 MW of additional flexible resources, with 300 MW expected to be obtained by the end of 2017 and the remaining by the end of 2018” (Workshop #2 – Slide 8).*** During the workshop, the IESO further clarified that “obtained” means in operation.

**Also in Workshop #1, it was conveyed that the need for flexibility (i.e., due to forecasting challenges associated with variable generation (VG)), would remain over the long term somewhat proportional to the amount of VG included in the province's energy mix.**



### ***Energy Storage Ontario Response:***

- Energy storage is fully commercial and capable of delivering the 1000 MW of flexibility as determined by the IESO. Many energy storage solutions can be readily implemented within the timeframes identified by the IESO depending on location and scale. Some technologies require shorter lead times, such as batteries, and can be developed, built and commissioned relatively quickly, in as little as six months if they receive support from the operator and agencies to be fast-tracked through the approval (e.g. connection) timelines. On the other hand, the development of some grid-scale energy storage solutions would exceed that time frame but should remain under consideration for the longer range flexibility needs given their large capacity and decades-long operational lifecycles.

### **3. IESO Principles: “*Solutions considered must be consistent with the following principles*” (Page 15 in Meeting #2 presentation)**

#### ***Maintain system reliability***

- ***Energy Storage Ontario Response:*** Energy storage solutions offer several means to support system reliability due to their overall service versatility, including acting as a fast-response flexible resource, as noted earlier in this submission. It is also our view the province should look towards economic solutions that support self-reliance so that serving power needs is not fundamentally dependent on external supply. Hurricane Sandy’s impact in PJM, for example, has given rise to the development of more effective islanding to manage power transport risks. This approach is particularly prudent given the increasing frequency of more extreme weather events associated with global warming.

#### ***Cost-effective, competitive, transparent and stable***

- ***Energy Storage Ontario Response:*** The recent procurements for energy storage have demonstrated that energy storage solutions can be economic and will become more so as the market develops resulting in unit cost decline as production volumes increase (as seen with solar PV). Also, advances in technology continue to increase capacity per unit cost. Newer technologies are proving to be stable and some technologies have been operational without issue for decades



(e.g. pumped storage). In addition to lower technology costs, the method of contracting and purchasing these flexibility services can result in lower cost of service on an annual basis. Specifically, longer duration contracts reduce financing risk and result in more cost-competitive solutions. For example, on an annual basis a three-year contract will be more expensive than a 20-year contract.

### ***Send efficient price signals***

- ***Energy Storage Ontario Response:*** The IESO market development will be looking to design markets rules that appropriately incent the provision of flexible resources. Other jurisdictions such as PJM, ERCOT and California have been working to address this issue with respect to their storage resources, which may provide some guidance for development in Ontario. ESO would be happy to engage in the appropriate IESO consultations for this purpose.
- ESO recommends consideration be given to recognizing the system value associated with resources that can respond very quickly and accurately by establishing a price signal based on a sliding scale that is tied to resource capability and performance, rather than awarding the same price to all resources that can meet a minimum set performance standard.

### ***Scalable to system need changes over time***

- ***Energy Storage Ontario Response:*** One of the key strengths of energy storage is its role as an excellent risk management tool in the context of planning for, and managing, an ever-changing system (both on the demand and supply sides). This is because energy storage resources are fast (can react quickly), versatile (do many jobs) and flexible/scalable (can vary input and output to balance supply and demand). As a result, energy storage is complementary to, and can be used to optimize the use of existing power assets.

### ***Technology neutral***

- ***Energy Storage Ontario Response:*** A pure technology-neutral approach will not necessarily yield the results consistent with the IESO stated principles nor support broader provincial policy objectives, such as carbon reduction. Ontario's experience demonstrates that technology-specific procurements have provided valuable advancements on the power grid.



### ***Other Criteria – Environmental Implications***

- ***Energy Storage Ontario Response:*** At Meeting #2, the issue of **environmental considerations** (i.e., carbon neutral or reducing) was raised as a missing consideration. Given Ontario's Climate Action Plan objectives, we don't see how this consideration can be ignored by any sector including the energy sector and initiatives such as this. Moreover, given that the need for more flexibility is driven by the increase in renewables (and need for lower carbon emissions), there should be recognition of solutions that provide flexible resources with low or zero emissions.

### ***Other Criteria – Ensuring Value through Stacking of Benefits***

- ***Energy Storage Ontario Response:*** At Meeting #2, ESO raised the question regarding how the stacking of benefits (as in the case of energy storage which can provide many services), is being considered given that there are separate consultations for flexibility and regulation service, for example. While energy storage can provide value in either of these cases, a key value of energy storage is the economy gained by the capital investment resulting in a facility being able to provide multiple services. Our understanding is the Market Renewal consultation will be considering this issue and is tasked with taking that holistic view. ESO will engage in that process. We remain concerned that the current timelines on these processes may result in the value of stacked benefits getting consideration too late in the game as near-term solutions get defined. We are keen to work with the IESO to find a way to capture the full economics of storage for the sake of the ratepayer, to support optimal operation of the grid the province's climate change objectives.

Thank you again for the opportunity to comment. Energy Storage Ontario will be pleased to provide further input or answer more detailed questions at your request. ESO looks forward to engaging further on this key initiative.

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