

IESO SENIOR MANAGEMENT UPDATE

To: Stakeholder Advisory Committee

From: Kim Warren, Vice President, Operations & COO

Date: August 20, 2014

Subject: Storage Update

Information Item

Benefits of Energy Storage

Unlike other forms of energy, electricity cannot be easily stored in large quantities. As a result, the electricity system has historically operated on a "just-in-time" basis – with decisions about electricity production based on real-time demand and the availability of transmission to deliver it.

With the emergence of new energy storage technologies, however, greater amounts of electricity can be captured and dispatched to the grid whenever required. Storage can also benefit the system in the following ways, fulfilling many of these roles at the same time:

- Easing points of congestion in transmission and distribution networks by temporarily absorbing surges and excess power flow, allowing utilities to defer, or even avoid, expensive system upgrades;
- Smoothing out fluctuations of solar and wind resources, bringing added stability to the electricity system;
- Providing critical reliability services that support voltage and frequency on the system; and
- Absorbing surplus baseload generation from renewable and other energy sources during off-peak hours and injecting it back into the system when demand is higher.

New Storage Projects

This March, the IESO issued a request for proposals (RFP) for up to 35 MW of storage capabilities to provide ancillary services:

- regulation service which acts on a second-to-second basis to match generation to demand and helps correct variations in power system frequency; and/or
- reactive support and voltage control which is needed to maintain voltages and support the flow of electricity along power lines.

Additionally, the IESO intends to examine the following:

- Integrating different energy storage facilities into the operation of the IESO-controlled grid (ICG) and to assess their capabilities at both the bulk transmission and distribution levels to provide these ancillary services and other services including bulk energy services, transmission infrastructure services, distribution infrastructure services and/or customer energy management services, and
- Identifying the opportunities that energy storage could provide to the future operation of the IESO-administered markets (IAMs) and how best to integrate it into the IAMs.

As part of the RFP process,

- the IESO held a briefing session
- received and responded to an extremely large amount of questions
- received a large amount of proposals from a number of proponents

These proposals were evaluated on numerous criteria including cost, diversity of technology options, and geographic location. While most of projects will be connected to the high-voltage transmission grid, the selection criteria also included a requirement for some projects to be connected to local distribution networks.

The IESO plans to finalize contracts with the following organizations by the end of the summer:

Proponent	Technology	MW
Canadian Solar Solutions Inc.	Battery	4
Convergent Energy and Power LLC	Battery Flywheel	12
Dimplex North America LTD	Thermal	0.74
Hecate Energy	Battery	14.8
Hydrogenics Corp.	Hydrogen	2