

Deputy Minister's Remarks for Energy Storage in Canada's *Connecting to Now* Conference

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- Good afternoon everyone.
- I'm Serge Imbrogno, Deputy Minister at the Ontario Ministry of Energy.
- It's a pleasure to be given this opportunity to speak at today's event: the *Connecting to Now* conference, hosted by Energy Storage in Canada.
- When discussing the world of energy storage, the word "game-changer" is often used to describe its vast and immense potential.
- From my perspective, having worked in energy policy for quite some time...
- I would add that "radical" or better yet "revolutionary" also describe the ever-evolving, versatile world of energy storage.
- Ontario has a \$20 billion electricity system, and huge potential to revolutionize the grid in terms of energy storage.
- Be it flow batteries, flywheels or compressed air storage – these and other innovative energy storage technologies will no doubt forever change the grid, and for the better.
- For the purpose of today, I'd like to discuss what the Ontario government – and more specifically, the Ontario Ministry of Energy – is doing to help advance the field of energy storage.
- I'll first outline the role energy storage plays in the ministry's energy planning.
- I'll then briefly summarize some key findings from two recent reports focused on energy storage.
- Following that, I'll outline the road ahead for energy storage from the Ministry of Energy's perspective.
- That's a lot to cover in 15 minutes directly following a lunch break.
- The question likely on everyone's mind here today is: what is the Ontario government doing to advance energy storage.
- I should emphasize: the Ministry of Energy is no stranger to the wonders of energy storage.

- In fact, over the years, we've made understanding the value of energy storage a ministry priority.
- In the 2013 Long-Term Energy Plan (LTEP), *Achieving Balance*, the Ministry of Energy made a commitment to procure energy storage.
- Led by IESO, we set our sight on procuring 50 megawatts of different types of energy storage.
- To meet this two-phased procurement, energy storage was featured in the recent updates to Ontario's net metering framework.
- The goal was to ensure that businesses and consumers alike will have more opportunities to generate and store renewable electricity.
- Creating an important value-add for energy storage in the process.
- Added to this: energy storage-related projects were eligible as part of the ministry's most recent large renewable procurement.
- In addition, the Ministry of Energy funds initiatives to advance this innovative technology through Ontario's Smart Grid Fund (SGF).
- Launched in 2011, the SGF supports the growth and advancement of the province's electricity grid.
- It does so by investing in Ontario-based projects whose aim is to bring the benefits of a smart grid to homes and businesses, while providing economic development opportunities and creating jobs.
- Energy storage features prominently in many SGF-funded projects.
- Let me provide a recent example.
- In November 2016, a smart grid demonstration site was launched in Sudbury.
- With the help of SGF funding, the smart microgrid uses technology to gather and act on information to better manage energy use.
- This technology uses three energy sources: solar panels, a battery bank to store the power, and electricity from the Greater Sudbury Hydro's local distribution grid.ⁱ
- This project will help Science North – Canada's second-largest science centre – reduce its dependence on the electricity grid.
- And in the process gain greater influence over their consumption.ⁱⁱ

- Another SGF-funded project also worthy of mention involves Renewable Energy Systems, which is developing an energy storage system to support a LDC's substation.
- Upon completion, this project will not only improve the quality of supply for those customers connected to the substation.
- It will allow the LDC to defer investment that would otherwise be necessary to upgrade the substation.
- Speaking of LDCs and energy storage, this past June, Ryerson University and Toronto Hydro – in partnership with eCamion – launched the world's first pole-mounted energy devices to supplement electricity during peak hour in homes.
- In this case, a compact white box no bigger than a suitcase was mounted six metres up a hydro pole and paired with a 50 kW transformer that typically powers about 12 houses. ⁱⁱⁱ
- While these units store about 15 kilowatts hours of energy, and are not meant to provide the bulk electricity that powers houses...
- They support the grid by making by storing energy during off-peak hours and releasing it when it is needed – during periods of high demand.
- That, to borrow from the title of this conference, will help better “connect to now.”
- Collectively, these initiatives are proof positive of the Ontario government's commitment to energy storage...
- At the same time, in our continued efforts to gain a better understanding of this technology, we've commissioned studies looking into the different values of storage.
- The first, conducted by the IESO, was released in March 2016.
- While the key findings of this report are well known, three findings are of particular interest.
- First, energy storage could provide regulation services at a cost that is comparable to the cost of traditional providers such as hydro-electric plants. ^{iv} Regulation service corrects for short-term changes in electricity use that might affect the stability of the system.
- Secondly, energy storage could potentially alleviate transmission constraints by time-shifting energy in major load centres such as the GTHA, Ottawa, Kitchener-Waterloo-Cambridge Guelph. ^v
- And finally, energy storage provides an opportunity for long duration type energy storage to help manage some of Ontario's generation surplus. ^{vi}
- By the same token, the IESO's energy storage report also cited some important lessons-learned.

- Topping the list: that energy storage needs to be properly sized and located to provide effective regulation services.^{vii}
- Provided that energy storage, in turn, compliments a portfolio that includes traditional regulation technologies.^{viii}
- Added to this: the losses incurred when converting energy from one form to another and energy losses from storage.
- These are important aspects to consider when selecting energy storage technologies aimed at providing specific services.^{ix}
- To gain further insight into the ever-changing world of energy storage, the Ministry of Energy commissioned Essex Energy, an energy technology-focused company, to study the benefits specific to distribution-level storage.
- This study is now complete and will be published shortly.
- In the meantime, I'd like to share some key highlights.
- First, as prices continue to decrease, Essex Energy's study found that energy storage will become a more viable option for local distribution companies (LDCs).
- That said, the value of distribution-connected energy storage of course depends on location, cost and purpose.
- We know that energy storage provides direct benefits to LDCs.
- Benefits that range from enabling renewables at a transmission station...
- To providing reliability services at the end of the feeder.
- I want to highlight in particular one of the most interesting findings in this study. It found that there is already a strong business case for our large industrial and commercial ratepayers to invest in energy storage to reduce demand.
- This finding is supported by recent changes to customer classes, enabling more large customers to fit into Class A and use energy storage to reduce their peak demands.
- As this market develops, customers will have greater choice in their energy decisions, facilitated by a new business model – demonstrating how innovative Ontario's energy sector can be.
- The study also noted that there are barriers that prevent energy storage for being a viable option for LDCs.
- First among them is the application of the Global Adjustment.

- I'd now like to talk about energy storage in the context of Ontario's long term energy plan.
- As most of you know, the Ministry is finalizing our long term energy plan, which we expect to release shortly.
- Our current robust supply provides us with ideal conditions to take the time required to explore new approaches to procure electricity generation and capacity – and implement them efficiently.
- These approaches will need to have flexibility built into all facets of their design to ensure Ontario is well positioned to accommodate and benefit from emerging energy technologies.
- Added to this: we must also ensure that the system's needs are met at the lowest cost to ratepayers.
- As part of our LTEP process, Ministry staff travelled across Ontario between October and December 2016.
- Time and again during last fall's LTEP consultations – in which ministry staff met with energy stakeholders and the general public in 17 communities across Ontario
- In addition to 17 Indigenous engagement sessions...
- Energy storage was often discussed.
- This input – and my ministry's continued efforts to advance energy storage – will be strongly considered for the 2017 LTEP.
- The Ministry will continue its work – with the support of our partners in the storage community – to address certain barriers that unfairly disadvantage storage.
- Other barriers challenge the ability of utilities, customers, and storage suppliers from achieving the full range of benefits.
- We will be looking to our agency partners to help us bring clarity to these issues and find ways to enable more innovation – innovation that will improve our electricity systems and give customers more choice.
- This includes how the IESO-led Market Renewal initiative could help create a technology neutral open playing field whereby all energy resources – including new technologies like energy storage – could compete to procure electricity resources.
- That's the road ahead.
- And on that note, I'd like to thank Energy Storage Canada for inviting me to speak today.

¹ Science North takes control of its power through Smart Microgrid: October 27, 2016 sudbury.com:
<https://www.sudbury.com/local-news/science-north-takes-control-of-its-power-through-smart-microgrid-449314>

ⁱⁱ eCamion November 19, 2016 news release: Smart Grid Demonstration Site Launched at Science North:

<http://www.ecamion.com/smartgridatsciencenorth/>

ⁱⁱⁱ Toronto Hydro, Ryerson Launch Pilot Project to Store Energy in Pole-Mounted Compact Box, Toronto Star, June 21, 2017: <https://www.thestar.com/news/gta/2017/06/21/toronto-hydro-ryerson-launch-pilot-project-to-store-energy-in-pole-mounted-compact-box.html>

^{iv} IESO's Report: Energy Storage, March 2016, page 1: [file:///C:/Users/lmlyPa.CAC/Downloads/IESO-Energy-Storage-Report_March-2016%20\(1\).pdf](file:///C:/Users/lmlyPa.CAC/Downloads/IESO-Energy-Storage-Report_March-2016%20(1).pdf)

^{lv}: Ibid page 5

^{vi} Ibid page 1

^{vii} Ibid page 2

^{viii} Ibid page 2

^{ix} Ibid page 3