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Standing Committee on Finance

Pre-Budget Consultation

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Energy Storage Ontario Executive Summary

Energy Storage Ontario (ESO) requests that the Standing Committee address the following three key components in the 2017 budget:

- **Make key energy investments to ensure the reduction of carbon and mitigation of climate change;**
- **Spur growth in innovation and clean technology;**
- **Develop and build innovative and sustainable infrastructure for the future.**

To achieve this, Canada should

- **Enable a pricing mechanism to carbon emissions;**
- **Increase grid efficiency by encouraging and enabling the deployment of the energy storage projects in Canada;**
- **Implement policies that encourage innovation and investment in the development and growth in clean-tech energy storage industry.**

Key recommendations

1. Introduce tax incentives for Energy Storage, which could include
 - a. Allow energy storage to be eligible for the Canadian Renewable and Conservation Expense (CRCE) tax incentives;



- b. Allowing energy storage assets to be eligible for accelerated depreciation under class 43.2 for at least 10 years
 - c. Exempt all corporate taxpayers from the “Specified Energy Property” rules;
 - d. Grant legislative exemption from the application of the tax shelter rules and the rules that prevent the benefit of the tax incentives from being allocated disproportionately between the taxable and tax exempt partners;
 - e. Introduce an Energy Storage specific refundable Investment Tax Credit on Capital Costs for taxpayers who invest in energy storage projects;
2. Direct/Match funding of projects or innovation programs;
 3. Other mechanisms providing low cost investment for capital intensive projects such as Green Bonds or Loan guarantees;
 4. Support for studies identifying the need and use cases of energy storage;

Introduction

Energy Storage Ontario (ESO) is pleased to make this submission to the Standing Committee on Finance to support the Committee’s efforts to develop Canada’s 2017 budget.

Canada is at a pivotal moment in the determination of making the right investments to reduce the impact of climate change, to spur growth in innovation and clean technology and to ensure the country builds sustainable infrastructure for the future.

ESO is making recommendations to ensure that the value of energy storage is understood and considered in the 2017 Federal budget.

Energy Storage Ontario

ESO is the industry organization that represents the broad range of companies engaged in the energy storage business in Ontario and Canada. We are the largest trade association in Canada focused on advancing the role of energy storage and building the market for the energy storage business.

Our membership represents all players along the energy storage value chain -- technology providers, project developers, investors and operators, local electricity distribution companies, and NGOs.



We have also partnered with other organizations, such as the National Research Council of Canada (NRC), and with Ryerson University on their Energy Storage Technology Network projects funded through Natural Sciences and Engineering Research Council of Canada (NSERC).

A full list of our membership is available on our website and as an attachment to this document.

Overall Opportunity

Through this budget, Canada is in a tremendous position to demonstrate leadership on how an economy can grow prosper while migrating to low-carbon energy systems. To get there three critical components are required:

1. A price on carbon emissions that provides consumers and business with financial incentives to move to low carbon energy systems;
2. High-efficiency energy systems that use less energy and require less overall investment to do the same or more work and;
3. Energy storage systems that will enable meaningful reduction of fossil-based energy generation through the existing carbon-free energy systems and the further deployment of additional renewable generation such as wind and solar.

Energy storage systems should play an increasingly vital role in Canada's energy future as we modernize our energy systems. With the right market structures, Canada can ensure affordable and reliable energy that supports carbon reduction goals, advances a more efficient system for operation and enhanced renewables integration, and spurs innovation and economic development.

Value Proposition of Energy Storage

Energy Storage technologies fundamentally improve the way we generate, deliver, and consume electricity. They have the power and versatility to make our power networks more resilient, efficient, and cleaner than ever before.

These technologies include different types of batteries, flywheels, power-to-gas (hydrogen), compressed air and pumped hydro. Energy Storage adds value at all points in the energy system-- transmission grid, local distribution network and behind the meter on a customers' premises. It can increase the value of the energy produced by other sources and adds capacity to the system. It can act



as a load and generator and provide a range of grid balancing services including regulation services, voltage support and grid congestion management. The fast response capabilities of energy storage also enables grid operators to more effectively integrate increasing amounts of renewable generation. Energy storage assets can lower greenhouse gas emissions by permitting more efficient dispatch of gas-fired generators, and lower system costs by deferring costly transmission and distribution system upgrades. The result is a cleaner, more flexible and cost-effective electricity system.

Energy storage systems also have the ability to absorb excess energy from a clean electricity grid, store it, and re-inject it into the overall energy system. Energy storage technologies provide a unique pathway to decarbonize sectors that traditionally have not been able to benefit from renewable electric generation, such as the transportation sector or industrial energy use.

Energy storage technologies have been commercially deployed in various jurisdictions in the world and have proven to be cost competitive in certain specific applications while demonstrating great potential for a multitude of services that will make the electricity grid more cost effective. For instance, Ontario deployed energy storage through a 50MW procurement for ancillary services completed in late 2015. These energy storage projects have set the foundation for applications that improve grid operation and resiliency in Ontario.

As grid energy storage is relatively new, the majority of provincial electricity market structures and regulatory regimes do not fully recognize the value provided by energy storage technologies, and in some cases do not even permit them. Additionally, like renewable energy projects, energy storage projects are generally capital intensive and require long term financing. These hurdles make deployment of energy storage technologies' difficult without support and leadership from the Canadian Federal Government.

Energy Storage in Canada

Energy storage is particularly relevant in Canada as it can:

- o Enable significant carbon emission reductions by making the electricity grid more efficient, integrating renewables and allowing clean, renewable electricity to be injected into other parts of Canada's energy system;



- Help move northern communities and resource developments off of diesel-based energy systems; reducing the carbon footprint of these communities and improving conditions in First Nations communities in the North;
- Enable grid islanding, increasing reliability and resiliency of local grids. This capability is especially relevant to an electricity grid that is increasingly under pressure from extreme weather events;
- Provide home owners with back-up power and control over time-of-use electricity prices without altering behaviour. This will enable better integration with rooftop solar system for self-consumption, increasing resiliency and reducing carbon emissions right in the home.
- Help to leverage Canada's thriving clean-tech innovation and manufacturing industry in the home market to encourage exports and further enable a low-carbon economy for the world.

Carbon Reduction

Canada can take this opportunity to emerge as a global leader in energy storage, while at the same time meeting out aggressive GHG reduction and low carbon economy policy objectives. In Ontario alone, there is an opportunity to use storage to reduce carbon-emissions from gas plants by up to 4.5 million tonnes of CO₂ per annum.

Micro-Grid Diesel Displacement

In conjunction with wind and solar, storage can also play an integral role in northern “off-diesel” strategies for Canada. Specifically, storage plus renewable microgrid systems can greatly reduce the amount of expensive, dirty diesel being shipped to these communities, while increasing power supply resiliency and reliability. These solutions can be installed relatively quickly and can bridge the gap for communities that might be awaiting transmission connections.

Local Grid Resiliency

The Canadian energy system and electricity grid is a vast and somewhat fragmented grid with pockets of high consumption often separated by hundreds of kilometers. With extreme weather events



increasing the pressure on the long transmission and distribution infrastructure connecting these pockets to centralized generation the local grids will need to be increasingly self-sufficient. Energy storage can enable these local grids to be much more reliable without as much dependency on outside supply, allowing for economically and technically optimized asset deployment to meet reliability standards.

Innovation Economy

Canada is flush with innovators, entrepreneurs and established companies working to improve the market for energy storage. Support for the Canadian energy storage industry will not only improve the electricity grid and its contribution to carbon reduction targets but also will create countless Canadian job opportunities and export potential for Canadian companies.

ESO's membership boasts innovative companies founded in Canada, active in the Canadian market and seeking opportunities in new export markets. For example:

- **Temporal Power** makes large steel flywheels respond to two-second signals from the electricity system operator to help regulate and match the power supply and demand
- **Hydrogenics** has pioneered high power density electrolyzers which split water to produce hydrogen allowing longer term energy storage as renewable fuel or renewable gas.
- **NRStor** is a developer that has won contracts with Ontario's Independent Electricity System Operator to develop projects with flywheels and compressed air energy storage technology as well as partnering with Tesla Energy and Opus One (another Ontario start-up) to bring the Tesla Powerwall home battery to Canada.

U.S. Model

It is instructive to look at other jurisdictions to learn how they have invested in energy storage as a tool for energy system management and economic development. Various U.S. states (e.g. California, Texas, Massachusetts) have taken important leadership to ensure the deployment of energy storage systems and technologies. In June 2016, President Obama's administration announced new executive



actions as well as state and private sector commitments to accelerate the integration of storage. The energy storage market there is set to grow to an annual installation size of 6 gigawatts (GW) in 2017 and over 40 GW by 2022 — from an initial base of only 0.34 GW installed in 2012 and 2013, according to research firm IHS. This represents more than 5% of total installed electric generation capacity by 2025.

Budget Support for Energy Storage

ESO recommends the budget lay out plans that encourage the deployment of energy storage across the various energy markets. Policies should be broad enough to include multiple technology types and investor types as well as be flexible enough to be integrated into the varying provincial policies.

These support mechanisms could include, without limitation, the following measures:

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 - a. Allow energy storage to be eligible for the Canadian Renewable and Conservation Expense (CRCE) tax incentives;
 - b. Allowing energy storage assets to be eligible for accelerated depreciation under class 43.2 for at least 10 years
 - c. Exempt all corporate taxpayers from the “Specified Energy Property” rules;
 - d. Grant legislative exemption from the application of the tax shelter rules and the rules that prevent the benefit of the tax incentives from being allocated disproportionately between the taxable and tax exempt partners;
 - e. Introduce an Energy Storage specific refundable Investment Tax Credit on Capital Costs for taxpayers who invest in energy storage projects;
2. Direct/Match funding of projects or innovation programs;
3. Other mechanisms providing low cost investment for capital intensive projects such as Green Bonds or Loan guarantees;
4. Support for studies identifying the need and use cases of energy storage;

Please contact us for more information or details on our proposal.



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Energy Storage Ontario Membership

The Voice of Leadership in Energy Storage

