

Energy Storage Canada
Submission to the National Infrastructure Assessment
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About Energy Storage Canada

Energy Storage Canada (ESC) is the trade organization that represents the broad range of companies engaged in the energy storage industry across Canada. We represent over 60 member organizations that range in size from large multinationals to smaller, innovative technology companies. Our goal is to build a sustainable market and demonstrate the value that energy storage contributes to our energy systems, our environment, and our economy. Canada has the opportunity to become a global leader in the energy storage industry by reinforcing innovation, creating expertise and jobs, and ensuring the establishment of a strong supply chain.

Introduction

As Canada emerges from the social and economic impacts of the Covid-19 Pandemic, our electricity grid will play a critical role in our recovery, as well as in addressing the challenge of climate change and meeting our 2030 and 2050 GHG reduction targets.

Energy storage is an essential ingredient in ensuring a low-carbon economy via electrification. It has the unique ability to extract more value from existing zero-carbon assets, such as nuclear, solar, wind and hydro. It is also unique in its capacity to provide multi-service benefits, including flexible capacity, peak capacity, ancillary services, deferral of additional investments in generation, transmission and distribution, improved reliability of the grid, and empowerment of customers.

These optimization services will become even more important as stimulus dollars are invested in energy assets; if stimulus dollars are used to reinforce existing systems, it will hamper Canada's economic recovery and competitiveness, and result in higher ratepayer costs. Critically, it will also slow Canada's transition to a low-carbon economy.

What inhibits broader deployment of energy storage is risk mitigation, access to capital and procurement processes that tend to benefit incumbent sectors. Despite acknowledged benefits that storage brings to an electricity system, as a new market entrant, storage is disadvantaged against traditional market players that are already built and operating.

Government officials now recognize that storage often falls through the cracks in the existing suite of government energy and climate programs. In the case of the Canada Infrastructure Bank, for example, the high threshold for financing precludes funding for the vast majority of storage projects. Storage solutions are often decentralized, and even many grid-scale projects are under \$50M. Other INFC programs generally rely on a municipal proponent, and municipal governments generally lean toward existing technologies in use on the grid.

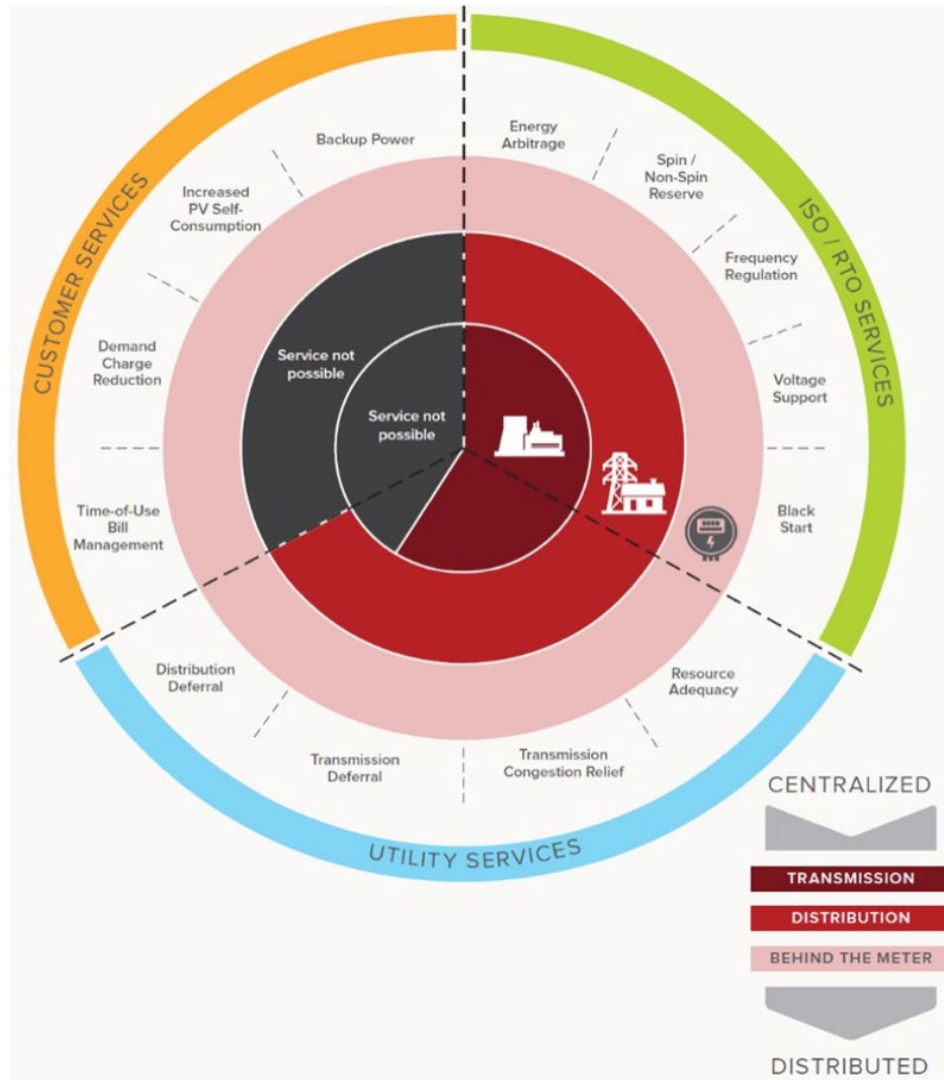
Core Objectives

Promoting Economic Growth, Job Creation and Competitiveness

Energy storage is a unique grid resource capable of providing more than 20 services on the grid. Many jurisdictions have recognized the value of this all-in-one capacity, and stand to benefit through lower costs, and savings to ratepayers and governments, from their investments in storage.¹

¹ See *State of Charge: Massachusetts Energy Storage Initiative Study*, 2016, <https://www.mass.gov/doc/state-of-charge-report/download>. The study found system savings associated with storage of \$2.2 billion, at a cost of between \$907 million and \$1.3 billion.

Fig. 1: Energy Storage Value Attributes



The capacity for storage to bring down electricity costs and reduce infrastructure and maintenance needs can greatly improve our economy’s competitiveness. This is true both at the utility level as well as for individual business, many of whom are deploying energy storage to reduce costs and improve environmental performance².

Canada has emerging technologies ready for export and deployment in domestic markets, but we risk falling behind our major trading partners on storage deployment due to a lack of investment and government priorities at various levels that effectively prioritize incumbent technologies on the grid.

² An Ontario study done by Power Advisory LLC, concluded that by fully enabling energy storage in the province by introducing at least 1,000 MW, ratepayers could potentially enjoy a net savings of \$2B over the next decade: <https://static1.squarespace.com/static/54485dc4e4b0f7bd2239a06b/t/5f11ca45f37fcb7b7e77584a/1595001417141/nlocki ng+Potential+-+An+Economic+Valuation+of+Energy+Storage+in+Ontario+%28July+2020%29.pdf>

In the United States, programs at the state and federal level remain unmatched in Canada. Several U.S. states have stipulated targets or developed incentive programs for energy storage to help integrate renewables, reduce GHG emissions, stimulate clean-tech jobs and ensure grid resilience. These include federal measures such as FERC Order 841,³ which instructs the utility commissions of each state to ensure that storage resources are eligible to participate in all capacity, energy and ancillary services markets, and FERC Order 2222⁴ which enables Distributed Energy Resource (DER) aggregations to fully participate in wholesale electricity markets.

At the state level, measures to incent storage include establishing targets, as in California (1,825 MW), New York (3,000 MW by 2030), Massachusetts (1,000 MWh), and New Jersey (2,000 MW by 2030). Among the additional state-level programs:

- California's Self Generation Incentive Program initially spurred the behind-the-meter storage market there and continues to invest US\$166M/year.
- New York has committed nearly \$350M in incentives for both retail and bulk level storage.
- Massachusetts launched the SMART program with a storage adder in 2018 and the state's utilities include an innovative energy storage program in their energy efficiency plans.

The US is seeing solid results from these programs. Jobs in the energy storage sector increased 235% from 2015 to 2019. By 2025, the U.S. Energy Storage Association estimates 200,000 jobs will be created in the sector, with annual deployment expected to reach 7.5GW. Research in Canada shows we could see similar job figures if Canada were to step up its storage investments.⁵

Storage is featured prominently in President Joe Biden's Infrastructure Plan. Congress has already approved an investment of over US\$1 billion in energy storage, and Biden has included an additional 26% tax credit for storage one of his top legislative priorities.

Tackling Climate Change and Increasing Resilience

Energy Storage investments address climate change by:

1. Increasing deployment of new and existing renewable energy by improving renewable energy output;
2. Reducing reliance on peak gas and coal via energy arbitrage to deliver at peak; and
3. Enabling multi-service capability (e.g., capacity, energy, regulation service, fast ramping, voltage support, black start) whereby energy needs can be met using stored energy from zero carbon resources (e.g., wind, solar, hydro, tidal, geothermal) rather than fossil fuels.

No other grid resource offers this unique and flexible value proposition.

³ <https://www.ferc.gov/sites/default/files/2020-12/Order-No-841.pdf>

⁴ https://www.ferc.gov/sites/default/files/2020-09/E-1_0.pdf

⁵ The National Research Council estimates energy storage would create 2.19 jobs for every MW of energy storage installed: *Canadian Energy Storage Report: 2019 Case Study for the Ontario Market*: <https://nrc-publications.canada.ca/eng/view/ft?id=5c38ed85-541c-4b7b-8b41-a97f544ce637>

Climate impacts, including flooding and extreme weather events, will greatly increase the risks to electricity infrastructure. Preparing for this will require distributed energy, system redundancy and other approaches in which energy storage plays a key role.⁶

Storage also offers a compelling value proposition to mitigate climate change. According to the National Research Council, adding 2,636 MW of installed energy storage would reduce Ontario's GHG emissions by 11% by 2030, while increasing Ontario's GDP by \$768 million, and adding 5,781 jobs.⁷

Energy storage can also be employed to address back-up power needs for homes and businesses, replacing diesel, gas and propane options. In addition to reducing GHGs, these options improve quality of life by reducing other criteria air contaminants, noise pollution and time and money spent on maintaining these resources.

Investments in Canada's electricity in the coming years will determine whether Canada can meet its GHG reduction potential for this sector. While the federal government has introduced a number of positive measures to reduce GHGs from electricity, its infrastructure, energy, and climate programs have generally had a blind spot when it comes to investing in storage. At this stage, continuing this pattern will create a longer-term path dependency on GHG-intensive options.

The Opportunity for Canada

There are three major areas where Canada can expand the energy storage opportunity:

- **Wholesale Market:** Energy storage can provide a range of wholesale market savings, including energy arbitrage and reduced prevalence of Surplus Baseload Generation, which is an issue Ontario.
- **Maximize Transmission and Distribution Investment:** Energy storage investments can be made at specific locations on the grid to better utilize existing transmission and distribution assets. All provincial regulators are increasingly focusing on the role of Non-Wire Alternatives, such as energy storage.
- **Direct-to-Customer Savings:** Energy storage can help electricity customers manage individual costs by shifting peak consumption, resulting in lower Time-of-Use rates and reduced demand charges. Energy storage can also help shift renewable energy output – largely from solar generators – from low-value to high-value hours.

From time to time, government programs introduce targeted measures that address one or a few of these opportunities (most notably, NRCan's new Smart Renewable Energy and Grid Modernization Program, which invests in front-of-the-meter projects), but given the barriers that exist in the market, the sector needs a more stable and broad measure that provides consistency and bankability for investment across the three areas noted above.

⁶ See National Renewable Energy Laboratory, "Distributed Energy Planning for Climate Resiliency," April 2018: <https://www.nrel.gov/docs/fy18osti/71310.pdf>.

⁷ National Research Council *Canadian Energy Storage Report: 2019 Case Study for the Ontario Market*: <https://nrc-publications.canada.ca/eng/view/ft?id=5c38ed85-541c-4b7b-8b41-a97f544ce637>

Such an investment should be comparable in scale to supports available elsewhere, particularly in the US, in line with Canada's Budget 2021 commitment to ensure that Canada keeps pace with the U.S. and other jurisdictions in providing the appropriate tax structures and incentives to encourage clean economy businesses here in Canada.

Proposal: An Investment Tax Credit (ITC) for Behind the Meter Storage Installations

With the introduction of NRCan's Smart Renewables and Electrification Pathways Program (SREPs) which provides up to \$964 million over four years for smart renewable energy and grid modernization projects, including for the first time explicitly for energy storage projects, it is expected that utility scale, in front of the meter energy storage projects will apply for this program. To help further reduce GHG emissions, lower electricity costs, and make our electricity grids more efficient, the federal government should establish a 30% tax credit for the installation of residential and commercial energy storage systems in order to support the enablement of behind the meter energy storage projects.

This tax credit, modelled on a current program in Maryland,⁸ would apply to stand-alone energy storage systems as well as hybrid storage-renewables systems. As in the US, the tax credit should be eligible along with any funding from other programs, including Canada's Infrastructure Bank.

The experience in the US with such measures is instructive. A similar ITC launched for renewables in 2006 has been characterized by the US solar industry as "one of the most important federal policy mechanisms to support the growth of solar energy in the United States. Since the ITC was enacted in 2006, the US solar industry has grown by more than 10,000% -- creating hundreds of thousands of jobs and investing billions of dollars in the US economy in the process."⁹

By incentivizing larger commercial and industrial customers to install behind the meter energy storage systems on or near their premises it would avoid the need for back-up diesel generation and help those customers better manage their consumption by relying on their storage systems during peak periods which would alleviate strain on the electricity grid.

Proposal: Lower the Threshold for Canada Infrastructure Bank Investment

The CIB is playing an important role in investing in utility scale energy storage projects however, as indicated above, CIB's high threshold for financing precludes funding for the vast majority of storage projects. Storage solutions are often decentralized, and even many grid-scale projects are under \$50M, therefore we look for the CIB to significantly lower their range (\$10 to \$20M range) for investment and/or for the Federal Government to consider establishing a new program and/or entity which a focus on supporting smaller DER-type projects.

⁸ See <https://energy.maryland.gov/business/Pages/EnergyStorage.aspx>.

⁹ Solar Energy Industry Association, <https://www.seia.org/initiatives/solar-investment-tax-credit-itc>