

Written Submission for the
Pre-Budget Consultations in Advance
of the 2020 Budget by
Energy Storage Canada

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Recommendation

- That the Government establish an **Emerging Energy Storage Program** focused on large-scale, long-duration transmission-connected energy storage, which has the potential to generate significant GHG reductions and create new economic development opportunities.



Rationale

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.

As the government works to further reduce carbon in our energy systems, build resiliency, flexibility and control costs, energy storage will be a key partner to facilitate this transition. Storage is a critical ingredient in ensuring a low-carbon economy.

Energy storage has the 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.

As the country also moves to greater reliance on the electricity grid and as the impacts of extreme weather events become a growing concern, it is imperative that Canada's future grid become more resilient, redundant and flexible.

Energy storage is a crucial enabling technology to make this vision a reality.

The reliable supply of cost effective and clean energy will be key to a thriving and sustainable Canadian economy. Historically, Canadian supply of renewable energy has come from large generation facilities delivering power to load centers through long and robust transmission lines. As the system expands and the demand for renewable power grows, it is expected that much of this growth will also come from distributed generation assets.

Value of a Program Focused on Large-Scale Energy Storage: Leveraging Canada's Energy Storage Potential

Large-scale energy storage deployments can be significant strategic assets that generate long term economic opportunities and yield substantial GHG reductions. Today, bulk-system energy storage projects, such as lithium-ion battery, compressed air energy storage and variable-speed pumped hydro are both deployed in other jurisdictions (e.g. Australia, Europe and the United States), but not significantly in Canada.

The key issue inhibiting broader deployment of energy storage is appropriate financing and the ability to access lower cost of capital. In particular, provincial trends toward technology-agnostic, single-service procurements generally fail to capture the full multi-service value that storage can provide. Despite the



acknowledged benefits that storage can bring to an electricity system, as a new entrant in the market, energy storage is disadvantaged against traditional market incumbents who are already built and operating. Having access to upfront capital makes overall financing and project costs less expensive, which in turn helps overcome these market barriers and improves ratepayer value.

Lowering the cost of financing is the sector’s preferred support mechanism to address the market barriers. Production incentives are less appropriate for energy storage, because they replicate the problem of the single-service approach of provincial energy procurement. This speaks to the unique multi-service characteristics of storage compared with generation assets. For example, offering a KW incentive for generation, can incent the wrong kind of behaviour when a different ancillary service may be what is required.

In the last few years, the government has put forward several valuable infrastructure programs (i.e. Emerging Renewables Power Program, Smart-Grid Fund, Low Carbon Economy Champions Fund, etc.) that focused on encouraging both Canada’s leadership in clean technology and reductions in GHG emissions.

However, there has been a significant gap when it comes to grid-scale energy storage. To date, grid-scale energy storage has been excluded from or ineligible for these programs either by design or inadvertently. See chart below:

Program	Dept	Eligibility
Smart Grid Program	NRCan	Proponents had to be partnered with a utility. These would tend to be smaller projects focused at the distribution level, not the transmission or bulk level.
Low Carbon Economy Challenge Fund	ECCC	Requirements specifically excluded projects generating electricity on the grid
EDC		Export only and not focused on GHG reductions
SDTC		Focused on early stage commercialization
ERPP	NRCan	Specifically excluded energy storage
Strategic Innovation Fund	NRCan	Large-scale energy storage is already commercialized technology – just not yet deployed in Canada
Green Infrastructure Fund	INFC	Required a municipal lead. In cases where a municipally owned utility wanted funding, it would be at distribution level, not grid scale

GHG Reductions and Job Creation

In keeping with the Finance Committee’s focus on “Climate Emergency: The Required Transition to a Low Carbon Economy,” energy storage makes an important contribution to this objective. Energy storage deployment can reduce GHG emissions: e.g. if 1,000 MW of energy storage displaces 1,000 MW of gas this results in significant GHG reduction. In addition, energy storage drives job creation.



According to a 2018 study by the U.S. Energy Storage Association, energy storage employment in the U.S. grew 235% from 2015-16 to 90,800 jobs. By 2025, it is predicted that close to 200,000 jobs will be created in R&D, manufacturing, project development and administration.

We believe that the deployment of large-scale energy storage represents an important opportunity for the government to deliver on its GHG reduction commitments while taking leadership in clean technology and economic development. As with other emerging technologies, energy storage facilities require higher upfront capital cost investment. However, they increase the value of all renewable technologies to reduce carbon emissions while introducing flexibility and resilience in the electricity system. Our growing Canadian energy storage industry has the potential to be a key driver of jobs, attract investment and export homegrown technology and expertise.

By reducing barriers to deployment through this type of program, Canada can become a leader in energy storage.

Regulatory and Market Issues

There is work being done, especially in Ontario and Alberta, to look at barriers and opportunities for storage in their respective electricity systems. Ontario's system operator has done work over the last few years to recognize and resolve these barriers as a way to facilitate participation of energy storage in the market.

Alberta has also explored how the characteristics of storage could benefit the province if there were more renewable sources of generation via its Energy and Ancillary Service (EAS) Roadmap) and the Alberta Utilities Commission (AUC) is also exploring innovation (including storage) through the distribution system.

In vertically integrated markets, there is work being done to explore storage (Quebec, B.C. Saskatchewan) as these jurisdictions deploy more renewables and find value in the range of services that storage can offer for integrating renewables and optimizing their systems.

Global Growth and Other Developments: FERC 841 is a Game Changer for Energy Storage

The global energy storage market will grow to a cumulative 942GW/2,857GWh by 2040, attracting US\$620 billion over the next two decades. (Source: Bloomberg New Energy Finance, November 2018) however as it stands today, Canada's contribution to this total is negligible.

In addition the US. energy storage is poised to expand rapidly in 2020 due to a Federal Energy Regulatory Commission (FERC) ruling (FERC 841) that mandated system operators and regional transmission organizations in the U.S. to develop participation models for energy storage. FERC 841 is a game-changing initiative in the market as it creates channels and compensation for energy storage to operate fairly in markets alongside traditional players.



Not only does this have influence on the Canadian market, but Canada can learn a great deal from how these plans are being implemented.

Results of Proposed Program

An Emerging Energy Storage Program would promote the development of Canadian emerging technologies – such as offshore (underwater) storage, flywheels, and batteries – as well as technologies available in other countries but not yet in Canada – such as grid-scale variable-speed pumped storage and compressed air.

Canada has a number of emerging and innovative storage technologies ready for export and domestic markets. The United States is currently reaping such benefits, with energy storage jobs increasing 235% from 2015 to 2016, for a total of 90,800 direct jobs. By 2025, this number is estimated to grow to nearly 200,000.

For an investment of \$200 million, a new program in Canada would result in

- Creation of 4,000-6,000 new jobs. These include construction jobs and also subsequent supply chain capacity and expertise;
- Investment of over \$2,4 Billion; and
- Cost savings to the grid of \$34M annually; and
- Reduction in GHGs of 500,000 tonnes, equivalent to taking nearly 100,000 cars off the road.¹

Conclusion

By establishing an Emerging Energy Storage Program that focuses on large-scale, grid-connected storage, the government would be able demonstrate important leadership in carbon reduction, economic development and job creation.

¹ Figures derived from *35 x 25: A Vision for Energy Storage* (Nov. 2017), Energy Storage Association.