ENERGY STORAGE CANADA

Clean Electricity Standard Discussion Paper Feedback

Submitted by Energy Storage Canada

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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 70 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

Energy Storage Canada (ESC) is pleased to provide comments on the federal government's Clean Electricity Standard Discussion Paper.

There is no pathway to net zero for the electricity sector that does not include energy storage. Storage has the unique ability to extract more value from existing zero-carbon assets, such as nuclear, solar, wind, tidal, geothermal, 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, system stability and empowerment of customers.

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 thermal resources; and
3. Enabling multi-service capability (e.g., capacity, energy, reliability, regulation service, operability, stability) whereby energy needs can be met using stored energy from zero carbon resources rather than fossil fuels.

No other grid resource offers this unique and flexible value proposition. As an illustration, 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.[1]

The responses below outline our views on the issues being raised in the process of developing the CES, and how energy storage can play a role in achieving the CES objective of achieving net zero by 2035.

Specific Responses to Discussion Paper Questions

Please note that some questions are skipped as ESC does not have a position on the issues raised.

General

1. **Should interim standards be included in the period before 2035?**

Interim standards will help provide certainty, thereby improving the investment climate for energy storage and other clean energy technologies.

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[1] 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. Similar savings have been found for other jurisdictions: See *State of Charge: Massachusetts Energy Storage Initiative Study*, 2016, https://www.mass.gov/doc/state-of-charge-report/download.

2. **How should the CES regulation be designed to minimize stranded capital assets and associated rate impacts?**

With respect to climate change, time is of the essence. Each investment decision made today will impact the potential to achieve the ambitious 2035 net-zero electricity sector objective. A strong, clear, and consistent national standard, with a little exemptions as possible, will help minimize stranded assets. The standard must provide a certainty for long-term non-emitting investments in the electricity sector to be successful. If the standard fails to adhere to these criteria, energy owners, operators and developers are more likely to continue operating more carbon-intensive assets, rather than planning a reasonable phase out of these assets in line with Canada's climate commitments. Further, failure to pivot towards a net-zero future now will require other measures as we get closer to the 2035 deadline, greatly exacerbating the stranded-asset risk.

Finally, if the process for developing the standard is delayed, this will heighten uncertainty and the risk of stranded assets, as market and regulatory decisions, especially around procurement, will not receive a signal early enough to avoid this dilemma.

3. **What would be an acceptable end-point emissions intensity standard to achieve the objective of the CES?**

ESC believes an acceptable end-point for the emissions intensity standard is net-zero; emissions intensity should be eliminated except for unique situations (see later comments).

4. **How do considerations differ for non-competitive electricity markets, vertically integrated utilities, etc.?**

In general, non-competitive electricity markets (e.g., remote communities, vertically integrated utilities) rely on system planning to make investment recommendations. Treatment of emission-intensive supply resources through a CES and Canada's broader climate change strategy is important inputs for system planners to make informed decisions. Where possible, the CES should support competitive pressures in non-competitive markets to support innovation, economic efficiencies, and risk mitigation. For example, non-competitive markets can utilize third-party providers for services while retaining the control and operation of assets inherent to the market structure.

Compliance flexibilities

5. **Should the CES offer compliance flexibilities?**

   a) **What kinds of flexibilities?**

The pillars of the future electricity system include safety, cost-effectiveness, reliability, and clean supply. System planners, buyers, policy makers, and market participants must balance these objectives when making investment decisions. Flexibility should be provided on potential paths to net-zero that support achieving the final objective. This may include ability to delay or shifting compliance to reflect uncertainties or unforeseen events that delay energization of key net-zero investments (e.g., longer than expected implementation of new transmission expansion). Further, flexibility can be offered to maintain reliability under extreme weather events or unique operating situations.

b) **Should the flexibilities be targeted to individual generating units? To corporate fleets of units, such as fleet averaging, etc.?**

In general, ESC believes flexibility should only be granted for specific situations where it is warranted based on unique circumstances that do not endanger investment confidence in non-emitting resources. The flexibility can be targeted at both individual generating units and fleet of units depending on the situation. For example, an individual generating unit retained to manage extreme resource adequacy events is reasonable as electricity systems approach a net-zero future. Another example is flexibility for fleet of units if large infrastructure developments are delayed through approvals or construction (e.g., new transmission line to allow flow of non-emitting generation from one region to another).

c) **What constraints or limitations should be incorporated into flexibilities?**

While flexibilities can be an effective way to accommodate unique contexts, they can also serve as loopholes. It is important to recognize that to maintain investment confidence not all projects should be accommodated or protected, and if a project will not meet the CES, it should not proceed. Flexibility measures should have a single and clear set of conditions that must be met, and the project must have a clear road map to full compliance. And such measures should be time-limited, and should not compromise the strength of the standard.

6. **Under what conditions should offset credits available through federal, provincial/territorial, or other programs be permitted?**

Offset credits should only be permitted under robust measurement and verification criteria to ensure the offsets are achieving the equivalent emissions reductions.

7. To what extent can negative emission technologies like BECCS and DAC contribute to meeting the obligations of a CES regulation? To what extent should they be allowed to contribute to meeting those obligations?
8. **Should compliance be assessed for the electricity sector on an annual or multi-year basis?**

   Compliance may be multi-faceted with a combination of annual and multiple year basis. The reasoning would be that electricity demand, and energy production, is weather dependant and emission production will oscillate depending on weather. Using both will maintain pressure to decarbonize the electricity sector while recognizing that operation of the electricity grid requires difficult decisions on an annual basis to maintain safe, reliable, and cost-effective operation.

Alignment with carbon pricing

9. **Should the way in which electricity generation is currently treated by carbon pricing be changed to facilitate achieving NZ2035?**

In short, ESC believes that all carbon intensive generation should be fully exposed to the carbon price and their marginal costs should reflect the cost of carbon.

10. **How might the treatment of electricity under the OBPS have to change to align with the CES?**

ESC recommends that OBPS be aligned for both existing and new emission-intensive supply resources. ESC's understanding is that currently the OBPS has a flat threshold for existing generation and a declining threshold for new generation. Perversely, this means that more efficient generation may have higher marginal operating costs compared to inefficient existing generation because of the OBPS.

Further, ESC strongly recommends that the OBPS be eliminated by 2030 so that all emission-intensity generation is fully exposed to carbon pricing. Electricity supply is a real-time activity that must match demand. To achieve a net-zero electricity sector, a clear and transparent price signal for the hours when the supply mix is carbon emission intensive is required for investment, customer actions, and operational decisions. Full carbon pricing provides that signal. For energy storage resources, this also provides a clear price signal for energy arbitrage decisions and when a storage facility should discharge energy to reduce carbon emission intensive generation output.

Treatment of natural gas generation

11. **What is the role of natural gas in a net-zero electricity sector before 2035? Post-2035?**

Energy storage benefits are targeted at optimizing the full range of electricity resources, and we play a key role in any of the potential pathways to net zero.

If the pathway involves a reduction of natural gas (especially new build) there are many storage technologies that can cost-effectively displace natural gas. Storage is especially effective at solving the intermittency dilemma of renewables, particularly as solar capacity ramps down in the early evening as demand for electricity continues to peak for an average of three to four hours. As noted in a recent report from Australia's Clean Air Council[2]:

> The market is now seeing a rapid transition to battery storage systems as a replacement for gas peakers as battery technology has advanced to the point where it can provide faster response for a much lower cost. Battery solutions can serve the same role traditionally performed by gas peakers by discharging when demand (and correspondingly prices) approach peak levels and sustaining output to cover the typical daily peak duration.
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> Battery storage, known for its fast and accurate response across numerous energy applications, has improved its capability and cost-effectiveness to become the pre-eminent peaking plant solution for energy grids across the world.

[2] See https://assets.cleanenergycouncil.org.au/documents/resources/reports/battery-storage-the-new-clean-peaker.pdf.

Moreover, the economics of energy storage will continue to improve given the undeniable price trends and technological advancements of recent years.[3]

ESC does clarify that lower carbon intensive fuels such as renewable natural gas (RNG) and alternative fuels (e.g., hydrogen) are options for gas-fired generation to explore. From a storage perspective, ESC believes there is significant potential for Power-to-Gas (P2G) applications that are created with non-emitting resources (e.g., green hydrogen) or re-use emissions for net-zero applications (e.g., synthetic natural gas from industrial carbon emissions).

12. **What flexibility should be allowed to use natural gas to maintain reliability in rare and extreme weather, emergencies, or other special circumstances? Which additional operating conditions/scenarios, if any, should be given special consideration?**

    a) **If natural gas has an electricity system-support role post-2035, what are the expected impacts on the rollout of emerging system support technologies such as energy storage?**

The role of natural gas (not supplied by alternative non-emitting fuels) should be limited to unique situations and extreme weather events. In short, ESC primarily sees a role for natural gas generation as a resource adequacy standby resource for exceptional circumstances. In the long run, the role of natural gas can be fully met by energy storage. Enabling natural gas under too many circumstances will be a constraint on expanding the role of storage as a cleaner, cost-effective alternative.

California has been more affected by extreme weather and wildfires than perhaps any other jurisdiction in North America. Yet its approach to emergency grid preparedness, as reflected in recent procurements and the Governor's 2021 Emergency Proclamation, relies on energy storage procurement and other clean energy options, and not on new natural gas.

    b) **If natural gas has a role in generation post-2035, what are the expected impacts on the penetration of nascent generation technologies like SMRs, geothermal electricity, etc.?**

See above

Treatment of industry, private generation and remote generation

13. **How should the CES treat electricity generated by cogeneration units that is sold to the electricity system? Should the CES apply fully to cogeneration units by 2035 or should it phase-in its application to cogeneration units after 2035?**

[3] Costs for battery storage have plummeted 90% over the past decade, and the U.S. National Renewable Energy Laboratory forecasts a further cost reduction in battery storage deployment of between 28 and 58% by 2030. Bloomberg's 2021 Global Energy Storage Outlook states, "This is the energy storage decade. We've been anticipating significant scale-up for many years and the industry is now more than ready to deliver."

14. **What are the benefits of applying a CES to industrial generation units? What are the challenges of doing so? Of not doing so?**

This would help maximize the GHG reduction impact of the CES, as it would help capture the potential of energy storage to reduce emissions from a range of facilities including cogeneration. Storage plays a similar role to combined heat and power facilities, by taking excess electricity supply and diverting it to where and when it is needed most. Further, energy storage combined with cogeneration applications or industrial generation units can increase the flexibility and operability of these units. This reduces excess emissions and can assist in the transition to a net-zero future.

Applying the standard to industrial users would help create further demand for energy storage and other technologies, spurring clean energy innovation.

15. **How should the CES consider electricity generation in remote, northern, and Indigenous communities?**

In southwestern Ontario, the proposed Oneida Energy Storage Project, one of the world's largest battery storage developments, is just one example of how Indigenous communities are poised to benefit significantly from changes to the electricity system that the CES can incent. Hybrid solar+storage systems, such as in Gull Bay, YT, are also illustrative of clean alternatives that have been developed in partnership with Indigenous communities.

For remote, off-grid, diesel-dependent communities, the net-zero solution is often renewables-powered microgrids, for which storage is an essential component to ensure reliability and efficient operation. Long duration storage may be especially important for these islanded systems.

In setting the CES's level of ambition and time frame, the government should fully take into account the current costs of existing systems – including the cost of transporting fuel (sometimes by air), or the cost of building new transmission lines that might be needed to connect a community or strengthen an existing connection to the grid. It should also take into account the full benefits of cleaner alternatives, and the role that storage can play in strengthening the resiliency, reliability, and efficiency of remote systems at a lower cost. While these benefits may not directly reduce GHGs, they are the key to unlocking the broader solutions that can.

16. **How should the CES consider distributed energy resources?**

DER will play an important role in the transition to net zero. Storage can expedite this transition by optimizing DER deployment. This is an example of where the federal government can work closely with provincial regulators to take best practices and apply them nationally. In the U.S. the Federal Energy Regulatory Commission Order No. 222 removes key barriers to DER (including energy storage) competing in energy services markets.

Assumptions made in the design of the CES, and the appropriate level of ambition for the scale and time frame for GHG reductions, should include the removal of such barriers in Canada.

Treatment of biomass

17. If CO_2 emissions from biomass combustion are not counted towards compliance under a CES, to what degree might biomass generation increase?
18. What types of biomass are suited to electricity generation? What are their characteristics with respect to regenerative life cycle, non-CO_2 GHG emissions, and land use characteristics?
19. What emissions reporting and compliance requirements for biomass generation should be considered to ensure that nature is protected and land-based emissions do not increase?

Other questions

20. **What additional investments are anticipated to be necessary to achieve NZ2035 to help ensure affordability for consumers?**

Federal support is needed to ramp up technologies that are competing with incumbent players in the electricity market – a market that was largely designed with those incumbent players in mind.

Support for energy storage, on par with current and planned support for SMRs, CCUS and hydrogen, is necessary if storage is to play the full role that it needs to – a role that includes optimizing these other emerging technologies.

A key challenge for achieving the NZ2035 objective is changes to electricity market design and system operation. Integration of energy storage resources and DER aggregation in wholesale markets are required. Additional investment in system operator tools should be a priority for both of these requirements. Further, investment in distribution system operations (e.g., outage management systems, new economic dispatch capabilities within the distribution system) to maximize the benefits of DERs, including distributed and behind-the-meter energy storage, is critical.

21. What role could existing and expanded energy efficiency programming play in helping to meet new demand as they transition towards net-zero 2035? What are the constraints for additional efficiency measures? Technological? Policy? Other?
22. What other factors should the government consider in developing the CES?

Should you have any questions, please do not hesitate to contact the undersigned at jrangooni@energystoragecanada.org

Sincerely,

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