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27 May 2016

Ontario Energy Board
Kirsten Walli
Board Secretary
2700-2300 Yonge Street
Toronto, ON M4P 1E4

Dear Ms. Walli:

Re: EB-2015-0043, Rate Design for Commercial and Industrial Electricity Customers

We are counsel to Energy Storage Ontario (**ESO**) in the above-noted matter. Please find attached ESO's comments on Board Staff's discussion paper, *Rate Design for Commercial and Industrial Electricity Customers: Aligning the Interests of Customers and Distributors*.

Yours very truly,

Lisa (Elisabeth) DeMarco

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c.15 (Schedule. B);

AND IN THE MATTER OF the Board's consultation on commercial and industrial rate design, specifically Board Staff's discussion paper, *Rate Design for Commercial and Industrial Electricity Customers: Aligning the Interests of Customers and Distributors.*

EB-2015-0043

Energy Storage Ontario ("ESO")

COMMENTS

May 27, 2016

1. We are counsel to Energy Storage Ontario (**ESO**) on the Ontario Energy Board's (the **Board's**) EB-2015-0043 process. ESO understands that the Board is undertaking this policy review of potential changes to commercial and industrial (**C/I**) electricity rate design as a result of recent and ongoing transformations resulting from significant technological advancements affecting how energy is produced, transported, and consumed.

2. The development and commercial deployment of energy storage in Ontario is, in fact, one of the significant technological advancements that has driven the thoughtful considerations outlined in the Board Staff Discussion Paper (**Board Staff Paper**) and new choices and options for both customers and distributors. ESO provides the following submissions in attempt to assist the Board in its understanding of the unique and multi-faceted benefits of storage in virtually all aspects of the electricity value chain, and the related challenges and opportunities in incorporating storage considerations into the C/I rate design regime.

3. Very generally, ESO's submissions are intended to:

   (a) provide specific recommendations on rate design for C/I customers that are considering behind-the-meter energy storage installations as a distributed energy resource (**DER**)

   (b) assist the Board in developing appropriate rate treatment for distribution connected energy storage that is not owned by or exclusive to and end use customer

   (c) differentiate bulk/wholesale energy storage from behind-the-meter energy storage assets

   (d) highlight the relevance of the policy review of Load Displacement Generation to the treatment of energy storage in C/I rate design, and

(e) ensure fair and equitable rate treatment of the benefits of energy storage directly and for customers that use energy storage to conserve, load shift, manage total energy costs, or otherwise optimize load, generation, distribution, and – by consequence – transmission.

4. ESO's submissions are organized as follows:

   (a) Background on ESO

   (b) The Value Proposition of Energy Storage

   (c) Detailed Comments on Board Staff Paper

Background on ESO

5. Energy Storage Ontario (ESO) is the industry organization representing a broad range of companies engaged in the energy storage business in Ontario. ESO is the only industry association in Canada focused on advancing the role and benefits of energy storage across the energy sector value chain, and facilitating efficient rate and market design in order to accommodate this new and advancing technological change.

6. ESO was incorporated in 2014 and has become an important information hub for energy storage in Canada, North America, and the Western world. Through networking, knowledge-sharing, advocacy, and stakeholder education, ESO is forging an increasingly efficient and effective energy storage industry that is demonstrating the value and innovation that energy storage can bring to energy systems.

7. ESO members represent the entire energy value chain from technology providers, project developers, power generators, local electricity distribution companies (LDCs), customers, and non-governmental organizations (NGOs). Together, these companies employ

thousands of Ontarians who are working to create opportunities for innovation, economic development, and jobs associated with energy storage.

8. ESO has a direct interest in the C/I Rate Design proceeding as the Board identifies supporting innovation and leveraging new technology for customers as key objectives.

9. The members of ESO have clear and unique expertise as both customers and suppliers of energy storage technologies and services. ESO believes that the rate design solutions proposed by Board Staff will be increasingly integral to energy storage companies and the optimization of all of Ontario's energy resources. ESO members wish to thank the Board for initiating this process and Board Staff for promulgating the Board Staff Paper. ESO members have, and wish to offer to the Board, their direct experience with all aspects of energy storage for both this and future matters.

The Value Proposition of Energy Storage

10. Energy storage is often called the Swiss Army knife of resources. It adds value at all points in the energy system from generation to distribution to transmission. It increases the value of the energy produced by other sources and adds capacity value to the system. There is a wide range of energy storage technologies. They include different types of batteries, flywheels, power-to-gas technology, compressed air energy storage, and pumped hydro.

11. Energy storage optimizes all the resources on the grid. It lowers greenhouse gas emissions, can help defer costly transmission and distribution system upgrades, and increases grid resilience and efficiency.

12. Energy storage systems have the ability to both instantly absorb excess energy from and insert required energy into the electricity grid as required. This permits the following to occur:

- storage of Ontario's persistent surplus of zero-emission base load generation capacity at night in both high value areas on the transmission grid and load centres within the distribution grid to be used during periods of high demand (not only does this maximize the value of current energy generation resources it also maximizes the use of existing transmission and distribution assets through reduced congestion in periods of high demand and variability throughout the day);
- smoothing of emissions-free energy from renewable, intermittent supply sources (thereby enhancing reliability and allowing a much greater percentage of renewables to be introduced into the electricity system);
- deploying local area microgrids that will provide communities with energy resiliency (thereby improving the reliability of local energy supply during climate change-induced and other weather events).
- facilitating significant integration of electric vehicles into Ontario without the need for significant new generation and major modifications to the distribution grid (thereby facilitating "energy storage based vehicle charging stations").

13. In general, the many values of energy storage in Ontario should be encouraged through the removal of regulatory barriers that disadvantage energy storage technologies and applications. While not the subject of this proceeding, ESO submits that such changes should include removing global adjustment charges on energy storage at the wholesale level.

14. In order to realize the many full value propositions of energy storage, the Board should also facilitate rate design that:

- enables customers to leverage new technologies, including self-generation using renewable resources;
- assists customers in managing their bills through conservation; and
- facilitates customer education through a better understand the value of electricity services including energy storage

Detailed Comments on the Board Staff Paper

15. Energy storage assets have the potential to shift a consumer from being a pure load consuming entity to a flexible, combined, load/energy service provider that is responsive to system needs. In order to achieve this available optimization of resources, the C/I rate design must recognize the value that behind-the-meter storage can play if the rate design encourages interactive "prosumers". At a minimum, ESO submits that the rate design must ensure that storage is not disadvantaged in each and all rate parameters including, without limitation, demand charges, standby charges, and any considered changes from net-load billing to gross-load billing.

16. Energy storage that operates in the wholesale market, regardless of connection at the transmission or distribution level, must compete on a level playing field alongside of other technical and market services such as expanded transmission networks, market exports, and reliability services like ancillary services. To achieve this level playing field the rate treatment of all storage assets that are not behind-the-meter solutions must be structured such that storage is not disadvantaged against other wholesale market services.

17. As an example, distribution-connected storage assets can provide an alternative to expanding system transmission infrastructure that would otherwise be required to meet the growing energy needs in Ontario's load centers. System demand charges would impair the economic viability of storage against expanded transmission networks despite storage providing the same, or higher, overall system value. Furthermore, other retail charges, like Global Adjustment, are not levied on market exports, so if storage is to compete as an alternative solution to exporting electricity at low costs we cannot impair the storage assets with retail rate treatment.

18. As an overarching principle, ESO submits that it is antithetical to shift behind-the-meter energy storage assets away from Net Load Billing for demand and related charges. This will disincent conservation, peak shaving, and demand reductions that would otherwise result in positive customer and system benefits. In contrast, Guelph Hydro, in its recent rate application, has applied to bill customers on a Gross-Load Billing basis (i.e., pre-installation of embedded resources like energy storage). ESO submits that this is contrary to the Board's current policy direction and that all embedded resources (batteries, combined heat and power (CHP), and distributed generation) should be accounted for on a Net-Load Billing basis.

19. Blanket application of standby charges for embedded storage resources can also provide perverse incentives and results contrary to the cost causation principle of rate making. When an embedded resource is not available to contribute electricity to the host-site, the power grid supplies the shortfall and standby charges are a considered a means of allocating upstream transmission and distribution costs to customers who rely on this infrastructure to back up embedded resources. However, the very nature of embedded resources offers a high level of diversity that makes wide-scale outages from the entire

portfolio of embedded resources unlikely. Despite the diversified and distributed nature of embedded resources, like storage, standby charge designs tend to allocate cost on the basis of 100% backup even if the outage on a particular distributed / embedded resource is not contributing to (coincident with) the distribution / transmission system peaks. Energy storage offers significant value to the larger distribution and transmission networks, and rate designs should define and reward this value – not tax it through the application of blunt, uniformly applicable, rate parameters like standby charges.

20. With respect to energy storage specifically, rate design changes toward gross load billing are particularly egregious because storage is deriving its total input energy from the electricity grid during off-peak periods of lower demand. On a total consumption basis, storage assets maintain the overall energy use of the network and levelize consumption to reduce peaks, enhance demand response, support ramping and black start, among other functions.

21. Generally, ESO supports the various Board Staff proposals that encourage consumers with behind-the-meter assets to operate differently during off-peak, low-demand periods. The Board may therefore wish to consider shifting the application of demand charges for embedded resources to apply only to energy consumers during on-peak periods and thereby encourage consumption of electricity during the off-peak, low-demand times. This would offer prosumers a direct incentive to load shift for the benefit of the consumer and the system. It would also decrease or defer the costs of distribution and transmission upgrades, with the potential to reduce Global Adjustment levies for all consumers if uneconomic market exports can be optimized for Ontario.

22. ESO also urges the Board to differentiate between behind-the-meter energy storage (to which the C/I rate design applies) and bulk/wholesale market energy storage assets

(which provide services into the IESO-controlled wholesale markets) in order to ensure that energy storage is not at a disadvantage to market exports. Bulk storage assets are service providers into the wholesale energy markets, and must therefore be excluded from the C/I distribution rate design process. Demand charges, Global Adjustment and other retail service costs are not part of the wholesale market rates that are involved in administering the wholesale energy markets and bulk market exports. ESO requests that the Board convene a future regulatory process in order to consider the rates applicable to bulk energy storage and related resources. ESO understands that bulk/wholesale energy storage that is connected to a transmission resources is not within the scope of this process.

23. **Transmission-related charges.** ESO respectfully submits that there appears to be a policy void related to transmission related charges for energy sources and hereby requests that the Board confirm that this matter will be dealt with through a separate process. Specifically, ESO requests that the Board resolve what appear to be conflicting messages around this issue:

- Board Staff Paper at p. 3 indicates that: *The way that the commodity,* ***transmission****, and other services are charged will not be affected.*

- The Guelph Hydro application, with a request for gross billing, indicates that:

> *Ontario Uniform Transmission Rates Schedule states that the billing demand for line and transformation connection services include not just a customer's net load, but also any customer load served by embedded generation facilities larger than one megawatt (or larger than two megawatts if the energy source is renewable)." "gross load billing." "issue of whether RTSRs should be applied on the basis of gross load, consistent with wholesale transmission rates, has recently arisen in rate applications. Guelph Hydro filed an application with the OEB requesting gross load billing for RTSRs for customers with LDG*

- Board Staff Paper at p. 14 indicates that peak demand on the transmission level follows a similar situation where some LDCs' peak demand is not in line with Ontario peak demand. Customers with LDG are helping reduce a LDC's peak and therefore costs towards transmission are treated accordingly. ESO submits that the same principles for demand charges should apply for transmission charges, including reduced stressors, equal savings, and therefore rate mechanisms that incentivize peak shaving, etc. with no standby charges at all of the LDC, transmission, and end-use customer level.

- Board Staff Paper at p. 5 relating to customer connects indicates that "*As customer numbers grow, these costs grow*." ESO respectfully questions the accuracy of this statement. Given the new technologies in data management and IT, and automation, is there no decrease in these base connection costs on a per customer basis? ESO is of the view that the customer connection (base charge) should decrease on a per customer basis given automation, smart meters, and related IT.

24. Board Staff note that there are actually two types of customer demand: (i) customer-specific demand used to size the equipment for customer connection (sometimes called **design demand** or connection demand) and (ii) **aggregated demand** that determines the sizes of assets that are meant to serve many customers. Energy storage facilitates reductions in both of these types of demand. Lower off-peak prices will encourage customers to make better use of existing distribution system assets and reduce the need for new capacity expansion. A price that does not differentiate between demand that drives cost and demand that does not, fails to align the interests of the customer and the distributor. ESO therefore submits that all rate design options should facilitate incentives to reduce each of design demand and aggregated demand.

25. ESO also supports the view that valuing DER should be location specific. Load control and balancing, VAR support, and frequency response are all benefits that the system requires and rates should incent in specific locations. It would therefore be prudent for the Board to provide a defined mechanism for customers with DER to provide these location-specific services. At a minimum LDCs should be required to financially demonstrate that a locational specific capital investment cannot be met through participation of "prosumers" in that region before any rate approval is provided for such a capital expenditure.

26. The design and operation of the system should be relatively indifferent to whether a customer's measurement of use at a connection represents pure load, load that is reduced by behind-the-meter generation, or load that is being reduced through conservation or active control. ESO asks that the Board confirm that this rate design process will lead to the removal of all standby charges in each LDC (Development of a Standby Rate Policy for Load Displacement Generation (EB-2013-0004)). Given that the fixed charges cover the minimum system, the stated goal is that new rate design will allow customers to use DERs such as LDGs to reduce their contribution to the actual cost drivers to the grid. Standby charges eliminate all incentives to be more efficient and conserve.

27. Board Staff invited comments on how any of the options will be affected by large amounts of net metering (Board Staff Paper at p. 12). While ESO has addressed this extensively, it warrants highlighting the fact that net metering electricity that is produced from renewable sources will not reduce the cost drivers by the customer, due to the intermittent nature of resources used for net metering. Customers will still require both localized and aggregated distribution connection to meet their maximum load. The variability in power output to the

grid can impact the locational specific power quality and require further capital investment or participation from prosumers (p. 34) to fully be integrated.

28. **Flexible Demand Charges.** In order to benefit from reduced demand charges, ESO supports the view that customers with net metering should be required to meet specific demand profiles (injecting, consuming)/power quality outputs, that will result in no additional costs to other customers. The use of storage with these intermittent electricity sources could allow these customers to fully utilize net metering and reduce their impact on the grid, while not impacting other customers.

29. **Demand rates for Large Customers.** Board Staff have not proposed demand rates for GS<50 customers and have tried to keep the options for this rate class simpler and usage based. Specifically, ESO agrees that new technologies in energy management, including the deployment of smart meters, third-party applications, and many energy management providers, allow these customers to take advantage of distribution charges based on their demand without requiring a high level of understanding, active participation, and allows them to be price responsive. As such, billing based on demand will allow these customers to reduce their impact to the grid more precisely, like any other C/I customer. Rate designs for these customers should also be based on demand and not on volumetric usage, with the same rationale applied to fixed charges being based on the minimum design.

30. **Minimum Bill Approach.** Board Staff requested stakeholders that favour a minimum bill approach, to provide comments on preferences for the underlying rate design. ESO submits that a minimum bill will only benefit customers who can either conserve or net meter and remove all incentives for reducing peaks (<50 KW). It does not align the customer with reducing their peak with aggregated distribution costs (coincident peaks).

Further ESO submits that a minimum bill approach could limit the customer from adopting new technologies, and conservation strategies.

31. **Non-coincident Peak (NCP) Rates.** Board Staff requested comments on whether the NCP rate should be a monthly maximum or some kind of ratchet that would reflect an annual peak (p. 25). While ESO agrees that the NCP rate should be based on a monthly maximum as it provides the customer with the incentive to reduce their peak on a monthly basis, there is a need to better understand the ratchet method. Generally, customers with LDG and net metering may reduce their demand, and be provided with the incentives to perform at a high rate of availability. However appropriate design is required to ensure that this does not lead to high demand charges during peaks. ESO generally agrees that

> *[t]his rate is closely linked to cost drivers. It ensures that a customer pays for fixed customer costs, customer connection and contribution to peak capacity. The intent is to eliminate the need for specialized charging for distributed generation or net metering since the underlying distribution rate is recovery from customers according to their use. The peak demand rate would reward customers for generation on-peak but also charge them for use when their generator was down for maintenance or repair.*

32. Option 5b provides a narrow peak to match a specific distribution peak. ESO submits that energy storage is ideal to help reduce the impact of the Ontario "duck curve" by using solar energy during the middle of the day to charge and reduce distributer peaks later in the afternoon/evening. The peak outlined in this option would provide the correct market signals. Allowing LDCs to move the peak may be acceptable if such a move is supported by sufficient and reliable data and a reasonable time lag for customers to modify their operations.

33. Option 6b provides the possibility of off-peak demand being free of demand charges. ESO agrees with this structure, particularly given Ontario's unique challenges with surplus baseload generation, excess zero emission power production at night, and the related

negative pricing and other suboptimal remedies that have been crafted in attempt to address these inefficiencies.

34. **Credits for Distributed Energy Resources.** ESO agrees that LDCs should implement DER to reduce or defer required wires upgrades. To the extent feasible customers and providers should own and operate DER assets, as they are most likely to be lowest cost. LDCs may contract for the services or assets without requiring customers to absorb all capital costs in rates. Similarly, LDCs may wish to work with third-party aggregators in order to provide lower costs and allow more customer participation (reduced learning curves, energy management costs). ESO respectfully requests that, consistent with the Distribution System Code and the IESO license provisions relating to planning, the Board require LDCs to consider and include DERs in all capital planning, and project/service procurements.

35. Similarly, LDCs should provide customers with enhanced asset and system planning information to allow customers/energy storage providers to identify opportunities to optimize the system. LDCs should also be provided incentives for implementing DERs that provide the same or greater returns, with lower overall costs (consistent with the mechanisms implemented by Con-Ed, NYSIG). In this manner, the Board may wish to consider rate models that do not stipulate LDC sole control of storage assets, but rather LDC/customer shared control of assets to ensure system optimization from both the supply and demand sides of the energy equation.

36. In summary, ESO submits that the Board should, consistent with its actions in demand-side management and best rate design principles, ensure that the C/I rate design results in optimization of the system and not stagnation. In order to do so, it should ensure that

valuable DER resources including energy storage are both facilitated and incented – not prejudiced – by rate design.