

To: Ata Rehman, Director, Grid Planning & Operations Engineering, AESO

From: Justin W. Rangooni, Executive Director, Energy Storage Canada (ESC)

Date: August 31, 2020

Re: Proposed ESC Bulk & Regional Tariff Design Position Paper for Energy Storage Resources

Context

- The Alberta Electricity System Operator (AESO) published in the summer of 2019 an Energy Storage Roadmap that detailed an assessment of the potential benefits and integration activities for energy storage resources in the Alberta electricity market.¹
- The Energy Storage Roadmap identified updates to the bulk & regional tariff design for appropriate treatment of energy storage resources and hybrid resources (i.e., generation resources sited with energy storage).
- In 2020, the AESO launched the Bulk & Regional Tariff consultation to review and consider changes in tariff design to respond to market evolution requirements including integration and fair treatment of energy storage resources.

Energy Storage Resources are Unique Market Participants

As described in the AESO energy storage roadmap, energy storage resources are a unique asset that will require market design changes to integrate energy storage resources fairly and equally into the Alberta electricity market. Energy storage resources are first and foremost a utilization tool to increase the efficiency and effectiveness of the electricity system. While energy storage can act as a load, energy storage is not an end-use customer that ultimately consumes electricity produced by generators. The natural operation of energy storage is to consume during lower price off-peak hours and produce during higher price on-peak hours. This operation decreases the average wholesale electricity price for customers and the strain on the existing transmission system. Changes to the bulk & regional tariff should reflect the uniqueness of energy storage resources and not result in additional costs that must be borne by end-use electricity customers.

Treatment of Energy Storage Resources in Other Jurisdictions

The tariff treatment of energy storage resources in other jurisdictions are a function of the established market design fundamentals. Our consultant, Power Advisory LLC, completed a high-level review of other jurisdictions and concluded that energy storage participating in wholesale

¹ <https://www.aeso.ca/assets/Uploads/Energy-Storage-Roadmap-Report.pdf>

markets are generally treated as a supply resources and have limited exposure to system costs. For example, most jurisdictions do not appear to apply transmission service costs and limit the exposure of ISO admin fees depending on services used (see chart below).

Table 1: Summary of Energy Storage Treatment in Select Other Jurisdictions

Jurisdictions	Treatment	ISO Admin Fees	Transmission System Costs	Station Power
ERCOT	Unique Wholesale Storage Load	Applied based on consumption	None	Yes, not for charging
CAISO	Supply	Must pay grid management fees	None	Yes, not for charging
MISO	Supply	Applied based on services used	None	Secure own supply
SPP	Supply	Applied based on services used	None	Yes, not for charging
PJM	Supply	Applied based on services used	None	Yes, not for charging
NYISO	Supply	Yes, depends on participation model	None	Yes, not for charging
ISO-NE	Supply & Load	Yes	Yes	Secure own supply

Proposed Energy Storage Tariff Treatment in Alberta

The Alberta tariff treatment for energy storage resources should follow the best practices of other jurisdictions:

- **Energy storage should be treated as a supply resource.** The primary objective of energy storage is to shift energy injection to higher value hours.
- **Energy storage should pay ISO admin fees based on the services being used.** Energy storage can use and provide a variety of services therefore ISO admin fees should be applied based on the actions of energy storage resources. The ISO admin fees may be influenced by the energy storage participation model if Alberta decides to use multiple participation models (e.g., standalone and hybrid).

- **Energy storage should pay, and be paid, based on wholesale electricity prices (i.e., AESO pool price).** Energy storage is dispatchable and able to participate in the real-time energy markets. Energy storage should pay the variable costs of the Alberta electricity system and the real-time wholesale electricity price is the most accurate representation of variable costs. Energy storage should fund the cost of interconnection akin to a supply resource.
- **Energy storage should not pay transmission system costs.** The transmission system is designed based on peak load flows and is essentially a fixed cost. Energy storage improves the efficiency of both the electricity market and the grid by shifting consumption from on-peak hours to off-peak hours. Shifting consumption reduces the current and future strain on the transmission system and increases the effectiveness of the existing transmission system. The transmission system should be funded by end-use customers. Energy storage is an intermediary market participant (i.e., energy consumed is injected later for end-use consumption). Applying transmission system costs to energy storage will increase the cost for services provided by energy storage to the detriment of end-use customers (e.g., like a fuel tax).

Further, transmission charges for storage devices will reduce market efficiency by distorting charge/discharge decisions. Unless instructed by the AESO for specific service provision (e.g., frequency response), energy storage will not consume when the transmission system is constrained. Instead, energy storage will increase the utilization of the existing transmission assets, defer the need for new transmission system investments and lower the cost of electricity service for end-use customers.

The ISO Tariff currently includes two opportunity rates (i.e., Demand Opportunity Service (DOS) and Export Opportunity Service (XOS)). Both services assume market participants may be consuming during constrained transmission system hours and would need to be curtailed by instruction from the AESO. Each service is charged based on an energy rate, which is detrimental to energy storage economics and would be added costs past on to end-use customers. The energy production shifting focus of energy storage does not result in consumption during constrained hours; therefore, neither DOS or XOS is an appropriate alternative for energy storage. If transmission system constraints occur, energy storage is a curtailable resource that can cease operation if required, or potentially offer service needed to resolve the constraint (e.g., increase consumption to reduce regional congestion during low load/high local generation system constraints).

- **Ensure fair treatment for loss reduction of energy storage operation.** Losses in the Alberta electricity market are applied as charges or credits based on location and power flow expectations. Energy storage operation will influence the losses expected in the Alberta power system. The ISO Tariff should review the losses calculation methodology and ensure fair treatment for energy storage operation will be maintained