STATE OF RHODE ISLAND PUBLIC UTILITIES COMMISSION

IN RE: DEVELOPMENT OF STORAGE TARIFF FRAMEWORKS	: :	DOCKET NO. 24-34-EL

Division of Public Utilities and Carriers
Comments in Response to PUC-Led Storage Workshop

Interconnection Tariff Framework (24-34-I)

1. Applicability

a. What constitutes the distribution system? Some existing generation facilities have purpose-built interconnection that serve no other distribution customers and may never serve additional customers. Are these distribution facilities? Does it matter if those facilities are built to connect directly to the transmission system?

b. For storage facilities co-located with facilities subject to existing interconnection tariffs and processes, should the existing tariffs control?

c. Should a single interconnection tariff for all export facilities not subject to an existing interconnection tariff be developed, or should the current focus be on storage facilities? For example, examining a tariff for additional facilities, such as microgrids, could be useful, but could be more time consuming and delay the outcome on storage interconnection.

a. The distribution system is defined in the current tariff for connecting distributed generation systems as the Electric Distribution System or EDS: ""Company EDS" refers to the distribution assets owned and operated by the Company, consistent with the Institute of Electrical and Electronics Engineers (IEEE) Standard for Interconnecting Distributed Resources with Electric Power System 1547-2003." This definition should guide the question of what facilities constitute the distribution system.

b. The current tariff should control existing storage facilities co-located with facilities subject to an existing interconnection agreement.

c. In the case of proposed changes to the operating characteristics of a system or in the case of a new Energy Storage System, a new interconnection agreement subject to the terms and conditions of the tariffs in effect at the time of the new interconnection request (or proposed change to an existing request) should control. The current docket should remain focused on energy storage given the immediate need to develop a storage interconnection framework. Given the unique nature and operating characteristics of storage assets, it is more appropriate to develop a new tariff for interconnecting storage assets separately from the existing Standards for Connecting Distributed Generation, RIPUC No.2258. Incorporating storage into the existing interconnection

standards and tariff would create increased complications and confusion which has already been exhibited in recent Petition hearings and DG interconnection disputes. The existing standards should serve as an excellent framework for the tariff and standards applicable to storage facilities. Furthermore, the preponderance of the existing standards language should be applicable with modifications and additions to address the unique characteristics of the various storage options.

3. Study Process

a. What interconnection studies should be required for energy storage resources?

i. Should the process allow for the applicant to seek alternative interconnection studies, for example one study without restrictions and one study subject to operational guidelines?

ii. If alternatives are allowed, how should alternatives be initiated and sequenced?

b. What characteristics of the facilities, such as size, location, and/or configuration, should determine the study requirements?

a. The studies required for energy storage resources should be based on the same principles guiding the existing procedures for distributed generation, recognizing the unique characteristics of energy storage, notably that these resources both export power to the electric distribution system (or transmission system) when discharging and draw power from the system when charging. New energy storage resources, whether standalone or paired with existing or proposed generators (i.e. solar PV or wind resources or other distributed generation), should be evaluated based on the proposed operational characteristics, including whether the resource will participate in wholesale markets or function solely as a retail asset. Factors such as whether a paired energy storage unit will be DC coupled with the generation source would impact how those assets would be studied and whether the addition of storage has a material impact on an existing interconnection agreement.

a.i. The question of whether the process allows for alternative interconnection studies must consider the complexity of multiple concurrent studies and balance the need to manage an already complex process for interconnection of distributed generation.

a.ii. and b. Due to the unique operating characteristics of energy storage, interconnection alternatives should be considered. This would allow for applicants to explore varying configurations to maximize benefits while minimizing infrastructure upgrades and costs. There are primarily three alternatives to consider: uncontrolled, operational restrictions where the applicant manages and directs the operation of the system, and operational restrictions where the utility manages and directs the operation of the system. The latter alternative would require utility systems to be in place such as DERMS and may be applicable in future years. Because an energy storage facility can represent both a power producing asset and a potentially significant new customer load, there will be more complex analysis required to determine the impacts on the

electric system associated with the combined new load and new power production resource, particularly for an uncontrolled interconnection. The energy storage project will also further complicate the potential cost sharing for new distribution facilities because it will be both a generating asset and a new load customer requiring much more energy supply than most distributed generation facilities. The fee structure in such situations would need to account for the increased study costs associated with this approach.

4. Costs

a. Should there be a payment schedule for interconnection costs?

i. What fees can be assessed fairly via a schedule?

ii. Which fees, if any, should depend on project scope and size?

iii. Which other interconnection costs should be collected from applicants and how?

iv. What is reasonable timing for assessment and payment of study costs and construction costs?

The fee structure should be consistent with the existing standards for distributed generation, adjusted for any unique situations (e.g. the potential allowance for alternative operating plans as described above).

b. Under what conditions, if any, should a storage facility be eligible for a reduction/credit to the interconnection construction costs? (See e.g., Tariff RIPUC No. 2243 Appendix A, Policy 3).

As it relates to RIPUC No. 2243, Customers installing storage resources that meet the requirements for a reduction in the costs of "New Facilities" should be evaluated in a manner which does not discriminate based on the language in Tariff RIPUC N. 2243 with the additional consideration for the fact this energy storage facility may also be a significant new load to be served and therefore would require further consideration.

8. Other: What other main elements can stakeholders identify that do not fall within the basic tariff structure provided above?

While battery storage is a predominate storage resource, any new standards and Tariffs should recognize the very broad range of energy storage facilities which should be allowed and considered under any new standards and Tariffs. These may be residential, commercial or industrial thermal storage facilities or other forms of heat recovery and storage applications. An example may be thermal ice production facilities used to displace chilled water compressor load during peak hours. Any new tariff structure should be broad enough to allow it to encompass current known and emerging technologies.

Terms and Conditions Tariff Framework (24-34-TC)

1 Availability

a. What types of energy storage resources should be eligible for service under a Wholesale Distribution Service ("WDS") tariff?

Any energy storge resource that meets the requirements of ISO-NE to participate in wholesale markets should be eligible to participate.

b. What types of energy storage resources should be eligible for service under a retail service tariff?

Any energy storge resource that meets the definition of energy storage under R.I. Law should be eligible to participate in a retail service tariff, whether that be existing retail tariffs or any newly designed storage specific tariff/ program. This should not be limited to battery energy storage technology only.

c. Should storage facilities be considered a distinct class of customers because they have unique characteristics, warranting separate cost allocation and rates?

> **i. Are these characteristics different for similarly designed wholesale and retail storage systems?**
>
> **ii. If storage facilities should be considered a distinct class of customers, should that apply to standalone, generation-sited, or other configurations?**

Storage assets designed to solely participate in wholesale markets should be considered a distinct class of customers and should be subject to the proposed WDS. The development of new retail tariffs specifically for energy storage assets should be considered. For example, retail storage tariffs that are designed to incorporate managed charging/ discharging of energy storage resources in exchange for incentive payments to storage asset owners may prove beneficial. Such programs would require unique tariffs. Storage assets paired with distributed generation may opt to participate in existing tariffs for net metering / RE Growth with modifications to accommodate storage. Furthermore, time differentiated tariff rates could be incorporated to encourage the optimal use of storage to maximize benefits to the EDS.

d. Should the tariff availability depend on concurrent enrollment in net metering, Renewable Energy Growth, or other programs or tariffs?

> **i. Should availability allow a wholesale storage facility to be paired with generation participating in the retail market?**

Availability should not be dependent on concurrent enrollment in other programs however, these programs may need to be modified to allow energy storage to be paired with renewable energy

resources. It is unclear how a storage asset paired with generation participating in the retail market could simultaneously participate in wholesale markets.

e. Should other facility types, like microgrids, be considered at this time or should a storage tariff be the priority?

The priority should be a focus on energy storage.

2. Costs

a. Once the interconnection costs for a storage facility have been incurred, do storage facilities generally create ongoing costs to the distribution system?

- **i. Operations costs?**
- **ii. Maintenance costs?**
- **iii. Ongoing capital investment? If so, related to what (growth, modernization, asset condition, etc.)?**

Storage assets, like any source of load on the distribution system create ongoing costs including ongoing maintenance, metering costs, and potential capital expenditures. Utility cost recovery is normally embedded in the retail rate which should be a consideration if a new tariff is developed. Storage assets can also be used to reduce certain distribution system costs depending on how these assets are utilized, and those benefits would be compensated under a specific program or tariff.

b. Do responses to part a on cost causation depend materially on any of the following:

- **i. Wholesale versus retail participation,**
- **ii. Metering/wiring configuration,**
- **iii. Whether the interconnection relies on existing distribution system capacity,**
- **iv. Timing of charging and discharging,**
- **v. Electrical location of the facility, or**
- **vi. Something else?**

All the above factors have the potential to contribute to the relative impact of storage, both in terms of creating costs and deferring or avoiding cost. For example, the impact of a storage asset that is DC coupled with a solar PV system may have limited ability to reduce peak loading on a circuit on the distribution system. Likewise, storage assets participating in wholesale markets will have varying impact on distribution system costs. If properly managed, a storage asset may completely eliminate a distribution system asset requirement. This requires a firm level of resource commitment and likely utility control. The level of hourly control of a storage asset can dramatically change its cost impacts and must be taken into consideration in tariff options and the overall study assessment process and ultimate interconnection agreement.

c. All retail customers are assessed certain mandatory charges per various laws. Are there any configurations under which storage connected to the distribution system would or should be able to avoid those charges?

Storage assets participating in wholesale markets and subject to the WDS may be exempt from certain mandatory charges that are unrelated to the utility assets used to serve the storage system. The development of the WDS should take into consideration whether and to what extent such mandatory charges should be excluded from the WDS. The WDS should be a cost-based tariff and the costs allocated to the customers taking service under this tariff should follow cost causation principles.

4. Other: What other main elements can stakeholders identify that do not fall within the basic tariff structure provided above?

No Response Proposed