VIA ELECTRONIC FILING

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RE: Docket UE-210183 Rulemaking to consider adoption of Markets and Compliance Requirements for the Clean Energy Transformation Act

Washington Department of Commerce May 3 Notice of Opportunity to Comment on Energy Storage Accounting Issues

Copenhagen Infrastructure Partners (CIP) submits these comments to the Utilities and Transportation Commission (the "Commission") and the Department of Commerce (Commerce) responding to the Request for Comments on Energy Storage Accounting Issues.

CIP is the project owner and developer of the 1,200 MW Goldendale Pumped Storage project located just south of Goldendale, Washington, and the 400 MW Swan Lake Pumped Storage Project located in southern Oregon.

Within their existing statutory authority, the Commission should establish rules that provide for valuation of, and create incentives for, replacing retiring thermal capacity with capacity that can store and redispatch renewable and nonemitting electricity, and replace the ancillary services provided by thermal resources. Storage must fill some, or a good portion, of that retiring capacity. As the integration of increasing amounts of variable renewable energy is analyzed, planned for and procured to meet CETA goals, we must consider the variety of storage resources that are or will become necessary – short, medium and long duration storage, distributed and bulk power storage, seasonal and cross sector storage, and customer owned storage.

This will inevitably include the need to identify, plan for, analyze, and value existing and new types of storage capacity, as well as how to best determine the timing and location of need, including consideration of unique acquisition lead times for the variety of storage resources[1] that will be needed. We recognize that the Commission has statutory authority and jurisdiction

[1] It is important to note here that our use of the term "resource" to describe the various storage types available is not intended to and does NOT equate storage resource to a generation resource. The commenters are not categorizing storage as generation for purposes of these comments as will be indicated in response to later questions.

regarding the investor-owned utilities that Commerce does not have over consumer owned utilities, and we ask that the two agencies recognize that difference when adopting (or not) the appropriate response to these questions.

Statutory Requirement to Consider Storage and Renewable Capacity

The 2019 Washington Legislature enacted the Clean Energy Transformation Act (CETA). The bill establishing CETA included RCW 19.405 and changes to RCW 19.280, which both directly and indirectly require addressing resource adequacy, reliability, integration of renewables, and addressing of overgeneration events and metrics for this transition to clean energy. As the region plans to retire thermal capacity resources, regulatory incentives (and disincentives) may ultimately determine whether enough capacity that is able to convert and dispatch variable renewable electricity is available to replace the retiring thermal capacity.

In light of, and coincident with this required retirement of thermal capacity will be the increasing deployment and use of variable renewable resources to meet the clean energy goals of CETA. In addition, CETA requires utilities to consider storage, both battery and pumped storage, in their resource planning. Storage, though not specifically called out as capacity, is the mechanism whereby variable renewable energy is converted to dispatchable renewable capacity, energy that can be dispatched at a different time than it was generated, and potentially transported through other than wires. Inherent in this conversion using storage is the loss of generated electricity in the cycling of energy through the storage process of pumping, charging or otherwise converting the electricity to capacity, dispatchability and reliability.

In addition, storage operations and technologies, and other methods of providing clean capacity, currently on the margins, on the horizon, or as yet unknown and/or developed by market forces should be expected to emerge over the ten (10) year planning horizon of the typical IRP and certainly over the twenty five (25) year horizon of CETA.

The majority of current and future renewable resources, typically wind and solar, will generate variable energy. While we have existing and developing regulatory and market mechanisms, such as Renewable Energy Credits ("RECs"), the Energy Imbalance Market ("EIM") and the Extended Day Ahead Market ("EDAM") to address the variability of renewable ***energy***, we do not have similar mechanisms for planning for, providing value to, developing, or providing compliance mechanisms to credit investments in renewable ***capacity*** and associated dispatchable energy.

In Washington State, we have no renewable *capacity* credit and no organized capacity market, yet the need for additional capacity has been identified and which must come from renewable and non-emitting resources.[2]

That need is at least implicit in CETA, which requires retirement of thermal capacity and planning for storage.This proceeding must recognize and address this coming capacity need.

[2] *See, e.g.*, Capacity Needs in the Pacific Northwest and California, ENERGY+ENVIRONMENTAL ECONOMICS (Dec. 2019).

Conventional Storage and Lack of Market and Regulatory Valuations and Metrics

Conventional storage can be thought of as a process, molecule, facility, or resource that is "charged" through the input of energy, then "discharged" when that stored energy is needed. Examples include pumped storage, battery storage, compressed air storage and electrolytic hydrogen. That charging and discharging cycling comes at a net loss of energy in the conversion to dispatchability. The current statutes do not account for let alone value these losses, but it should, and in a manner that provides value to that conversion.

For example, in a hypothetical pumped storage project with an 80% efficiency cycling rate, 100 megawatt-hours of variable renewable energy is used to pump a certain amount of water uphill, making that water available and dispatchable for generating renewable electricity. With 80% efficiency, 80 MWhs are available as dispatchable energy in this example. The 20% loss of energy is a cost (and benefit) of converting variable energy to available dispatchable energy plus ancillary services. The recovery of that 20 MWh requires adding 25% back to restore the equivalent energy used to charge[3], which is the equivalent of adding 25% to the cost of that MWh when competing in the market for that energy at that time. Looked at another way, 1.25 MWhs generated by a variable renewable resource would yield 1 MWh of dispatchable renewable energy. These same assumptions and calculations for cycling efficiency would be relevant for battery storage or any other storage resource such as compressed air storage or hydrogen.

RESPONSES TO QUESTIONS

1. **What information regarding the use of storage in meeting its CETA requirements should be included in the utility's CETA compliance report?**

   Utilities should report the type and characteristics of each storage resource owned or contracted by the utility, including the charging and discharging (dispatch) of electricity used to serve load. This will allow an average round trip efficiency calculation and at least a calculation as to the amount of capacity provided by the storage resource. These data may also become more important for future resource adequacy analyses for the region as storage resources become more ubiquitous in the transition to 80%, then 100% clean energy.

2. **How should the energy used and provided by energy storage resources be accounted for to ensure that nonpower attributes of renewable generation are not double counted? What compliance and reporting requirements would assure verification and prevent double counting?**

First and foremost, storage resources should not be considered generation for CETA compliance or other accounting purposes. Renewable Energy Credits (RECs) are generated at and measured in MWhs generated by the original generation. Storage does not create "new" electricity, it stores previously generated electricity for redispatch at a different time, and possibly a different location. Storage may provide ancillary services, depending upon the storage type, but these

3 20MWh / 80MWh = 25%.

services, while providing value to the grid, are not necessary for a utility to account for to demonstrate CETA compliance.

Therefore, no additional compliance or reporting requirement is necessary.

3. Should compliance and reporting rules related to energy storage be differentiated based on any of the following:

We see no compliance requirements for storage in RCW 19.405, while planning for storage is now included in RCW 19.280, including "*An assessment of methods, commercially available technologies, or facilities for integrating renewable resources, including but not limited to battery storage and pumped storage . . .*"[4]. CETA also contemplates storage and renewable resources as the preferred new resources to meet CETA requirements[5]. Each storage resource will provide different and potentially distinct values to grid operations, thus if the Commission or Commerce adopts reporting protocols for energy storage resources, we would suggest type, location, charging and discharging characteristics, and other services that may be provided by that resource.

a. The storage technology, such as battery storage or pumped hydro storage?

As stated earlier, each storage resource brings its own characteristics to grid operations. Battery storage may be interconnected on the distribution or transmission system, third party, utility or customer owned, short or medium duration, and other characteristics, while pumped hydro is likely bulk power, connected to the transmission system, and likely owned or subscribed to by multiple utilities. In addition, each storage resource brings additional grid services unique to the type of storage.

b. The location of the storage resource within the grid, such as collocated with a generating resource, interconnected in the transmission or distribution system, or at a retail customer's premise?

Yes, for storage that is grid connected for reasons as stated earlier. However, if storage is located behind a retail customer's meter, that storage will be included in a utility's load either or both through net metering reporting or demand response reporting[6].

c. The ownership of the storage resource, such as a utility subject to CETA, a non-utility operator, or a retail end use customer.

Ownership should be reported, as the ownership may determine how the electricity is treated under CETA.

[4] RCW 19.280.030(1)(e)
[5] RCW 19.405(3)(c)
[6] RCW 14.405.020(11) and other demand response planning requirements for utilities.

4. For a storage resource that is interconnected in the power grid, one possible approach to compliance is to treat it like a generating resource. The storage resource would be registered in the Western Renewable Energy Generation Information System (WREGIS). It would retire RECs for the renewable electricity used to charge the storage device and report verified data on discharge of electricity into the grid. WREGIS would create renewable energy credits (RECs) for the electricity discharged into the grid. If it used a combination of renewable and fossil sources for charging, a multi-fuel calculation would be applied to ensure that RECs are created only for the renewable portion of electricity generated into the grid. Please comment on the advantages, disadvantages, and necessary elements of this approach.

A storage resource should not be considered a generating resource. If the charging of the storage resource required retirement of a REC and reissuance on the discharge cycle, storage would be penalized by the loss of that proportion of the REC that was diminished through the round trip efficiency drop. This would penalize storage rather than value that loss as a conversion to capacity and dispatchability.

CETA does not include storage as a generating resource, the definition of a REC does not include electricity redispatched from a storage resource. Tracking the electricity attributes through the round-trip storage cycle may be necessary for fuel mix reporting, Clean Fuel Standard reporting and determination of the Carbon Intensity (CI), and perhaps to integrate with the recently adopted Cap and Invest law, as well as determining system capacity, reliability and resource adequacy calculations.

For purposes of CETA integration with these other statutes, we would suggest a pro-rata allocation of these attributes: the percentages of renewable, nonemitting and fossil sources for charging are the same proportion in the discharge cycle, reduced proportionally according to the round-trip efficiency drop. We do advocate for providing value to that drop (again prorated equally) as that conversion from a variable electricity resource into a dispatchable resources.

5. For a storage resource that is collocated with a renewable generating facility:

a. Should the storage accounting rules specify that RECs are created based on the amount of electricity generated or on the amount of electricity delivered into the grid?

To maintain consistency, a REC should be counted as generated, prior to roundtripping through a storage resource. Any round trip through the storage resource should be reported separately, and thus able to be measurable and transparent as to the capacity and other values that storage provides, in addition to not diminishing the value of the REC prior to injection into the grid.

b. How should power from the grid used to charge the storage resource be accounted for?

Exactly the same as for collocated generation and storage – for Fuel Mix and other reporting needs, generation should be accounted for prior to cycling through a storage resource, and capacity and other services provided by storage should be valued and accounted for separately.

6. For a storage resource located at a retail customer's premise, should the electricity used to charge the resource be included in the load of the utility for purposes of CETA? If the storage resource returns electricity to the grid, should this electricity be subtracted from the load of the utility for purposes of CETA?

We assume this question to be read as the storage resource is behind the customer's meter. To the extent that a retail customer is able to provide electricity back to the grid, it is either through a net metering tariff or demand response transaction with the utility. Net of those two, i.e. the net electricity delivered to a customer's meter should be considered load.

7. Use of a storage resource will result in electricity being delivered to load at a different time than the electricity was generated. WREGIS creates RECs with a vintage specified as month and year. Is month and year vintage information sufficient to ensure that renewable energy claims are accurate and that double counting of renewable generation does not occur? If not, what vintage detail should be required and why?

Yes – based on our responses to the other questions, we do believe the current vintage reporting is sufficient. A temporal change in the redispatch of electricity from storage is the value of storage, ie. dispatchable capacity and ancillary services. If any vintage detail is required on the discharge cycle, it should be for determining and providing for the value of that temporal difference between generation and redispatch.

8. If a storage facility operator charges an energy storage facility with a combination of renewable and non-renewable electricity, what verification, documentation, or calculation requirements would ensure that the output of the storage resource is accurately accounted for as renewable or non-renewable?

CETA does not require verification or documentation for storage resources other than planning requirements in the IRP process. However, for other statutes and studies such as Clean Fuel Standard, Cap and Invest and reliability and RA analyses, we assume that this data will be necessary and collected. The fuel mix of electricity delivered to load under WA law is reported each year and will be used for the other statutes. It seems appropriate to assign the discharging electricity the same level of reporting required of the charging electricity, diminished proportionally by the round trip efficiency drop on a reporting level currently required under Washington law.

9. Are there any energy storage accounting requirements used by other jurisdictions or by voluntary programs or protocols that the Commission should consider, either as guidance in adopting rules for CETA or to avoid potential conflicts in approaches?

CONCLUSION

CIP appreciates the opportunity to provide these comments to the UTC and Commerce. The questions raised by the Commission and Commerce are timely and complex, and to some extent still incomplete and evolving. Ultimately, we would request that the state agencies bring parties together in a post Covid world to analyze, discuss and further refine the answers to these complex questions. We believe storage is a vital and necessary component of the transition to a clean energy grid and strongly urge the rules adopted encourage the deployment, valuation and procurement of storage resources.

For any questions or clarifications, please contact:
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Respectfully submitted,

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