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Re: Comments of Renewable Northwest regarding the adoption of rules concerning the tracking and accounting of electricity used and provided in energy storage resources, Docket UE-210183

I. INTRODUCTION

Renewable Northwest thanks the Washington Utilities and Transportation Commission ("the Commission") and the Department of Commerce ("the Department") (collectively, "the Agencies") for this opportunity to comment on the tracking and accounting of electricity associated with energy storage resources such as batteries and pumped storage hydro. We view these comments as preliminary and note that some of our responses may change as the Agencies resolve issues and questions such as how to define the "use" of electricity.

Energy storage resources will likely play an integral role in the region's decarbonization efforts and are explicitly mentioned in the Clean Energy Transformation Act as a key resource to integrate high penetrations of renewable energy into the grid. Apart from facilitating renewables integration, storage resources are also highly flexible assets capable of providing shorter-timescale services such as frequency regulation, spinning reserves, voltage control, and other essential ancillary services. In fact, energy storage resources can provide dependable capacity during periods of peak or net peak demand and can also lead to higher value for energy produced by solar and wind resources. With this context in mind, it is important to ensure that storage resources paired with and charging from clean, nonemitting generators are not penalized for providing services that are valuable to the grid and instead are incentivized and valued to

ensure that project developers have confidence to innovate and tailor these resources based on a utility's need.

The Agencies' May 3, 2021 comment request ("the Notice") mentions two primary sources of complication related to electricity used to charge and ultimately discharged by storage resources: **(a) tracking the sources of electricity used in charging storage resources, and (b) accounting for the energy losses in charging and discharging storage resources**.

Firstly, it is important to recognize that energy storage resources are not "generators" in that they inherently cannot generate electricity but can be utilized to store and deliver electricity generated by a separate specified resource or delivered by the grid. Thus, energy storage resources should not be explicitly classified as a "generator" in the Western Renewable Energy Generation Information System ("WREGIS") or any other accounting system.

Secondly, it is also important to note here that storage resources are not monolithic and can be implemented in different configurations due to their flexibility in integrating renewable energy. As of today, there are broadly two avenues in which energy storage is deployed: a) *hybrid or co-located resources* wherein the storage component is paired with renewable resources, irrespective of the type of coupling, behind a single point of interconnection and b) *standalone energy storage resources* consisting solely of the storage component behind a point of interconnection. A "hybrid resource" is defined as a combination of multiple technologies that are physically and electronically controlled by an owner/operator behind the point of interconnection ("POI") and offered to the market or system operator *as a single resource* at that POI (single resource ID). Similarly, a "co-located resource" is a resource that physically shares a POI with another co-located resource of a different type but may interact with markets *independently* from the other co-located resources (multiple resource IDs).

Finally, energy losses in storage systems associated with renewable generators bring out a potential loophole related to valuation of associated RECs and utility compliance with CETA. Namely, when Renewable Energy Certificates ("RECs") are created at the point of generation and losses occur between charging and discharging a storage resource, there may be a disconnect between the RECs associated with renewable generation and the power ultimately "used" by a utility. A similar issue was addressed in a CETA rulemaking related to "calculation of greenhouse gas emissions in electricity"[1] wherein transmission losses are kept separate from a utility's electricity generation claims for calculation of greenhouse gas content in electricity. A stakeholder discussion around developing a similar mechanism to account for energy losses

[1] Calculation of Greenhouse Gas Emission Content in Electricity.
https://ecology.wa.gov/DOE/files/c0/c08b45ae-7140-4b30-a3c2-faf8aa042651.pdf

could ensure that RECs are valued appropriately and CETA compliance is both robust and fair. We recommend this issue be addressed in a future workshop.

Our comments broadly discuss how CETA accounting rules might interact with the non-power attributes of electricity related to energy storage resources specifically when deployed in-front of the meter. These non-power attributes are typically represented by RECs, which are created for every MWh of renewable energy generated and delivered to the electricity grid or to eligible on-site load. Because the physical electricity we receive through the utility grid says nothing of its origin or how it was generated, RECs play an important role in accounting, tracking, and assigning ownership to renewable electricity generation and use. Also, since energy storage resources are technically not "generating" resources, accounting for the RECs generated by hybrid and co-located resources consisting of a renewable and a storage resource behind a POI may be complicated unless a framework is developed to ensure that creation, reporting and accounting for RECs are accurate, transparent, and streamlined.

Coming back to how storage resources can be associated with RECs, hybrid and co-located resources offer an interesting case study. Because the renewable component in a hybrid resource is co-located, interconnected, and able to deliver MWhs to charge the storage component, the effective energy in MWhs delivered to the storage should be eligible to generate RECs to ensure accurate accounting of renewable energy generation. Hybrid resources can be implemented in multiple configurations based on the type of coupling, the size and type of inverter(s) and whether grid charging is possible (shown in Table 1 below). Since Investment Tax Credit ("ITC") penalties due to grid-charging only occur for the first five years of operation, this structure incentivizes the operator to optimize its performance by charging the battery from the grid when market prices are lower and delivering it when the prices (or demand) are higher. The tightly-coupled configuration is the sole exception due to its inability to charge from the grid even after the ITC expires.

Table 1. Different configurations for hybrid and co-located resources.

Type of Coupling	**Location**	**Point of Coupling**	**Storage Charged from**
AC-Coupled	Co-located	Transmission/Feeder	Renewable or Grid
DC-Coupled	Co-located	Inverter	Renewable or Grid
DC Tightly-Coupled	Co-located	Inverter	Renewable only

With this context in mind, there are several considerations based on the configuration and location of the energy storage component with respect to the renewable resource that will allow

the Agencies to avoid the risk of double-counting renewable generation and ensure accurate accounting:

- Since standalone energy storage is not a "generation" resource, for the purposes of CETA a storage resource should not be registered in WREGIS as a "generation" resource capable of creating and delivering RECs unless and until it is part of a system that is capable of storing energy only from the renewable resource. Thus, electricity discharged from standalone storage should not factor into any calculations related to RECs.

- For a hybrid resource with a single resource ID behind a POI, meter or measure the output in MWhs generated by the renewable energy facility including the energy delivered to charge the storage component for the purpose of REC creation, reporting, and compliance. If the storage is capable of charging from the grid, *subtract or net* the amount of MWhs inputted into the storage from the output.

- For a co-located resource with multiple resource IDs behind a POI, meter or measure the MWhs generated solely by the renewable component at the POI for the purpose of REC creation, reporting, and compliance irrespective of whether the energy is charging the storage or not. Charging and discharging the associated storage resource should not have any effect on the amount and value of RECs since both resources can be metered separately.

Further stakeholder discussions on losses related to long-distance transmission and storage round-trip efficiency could be helpful to ensure that CETA compliance is based on an accurate accounting of the aggregate MWhs delivered at the POI, *separate* from the amount of RECs generated by the renewable energy and that charging and discharging the storage component of a hybrid or co-located resource does not have any effects on REC creation. Our responses to the questions below revolve around these key considerations recognizing that energy storage, especially battery storage, is an emerging technology in Washington and the Pacific Northwest that requires further discussion and deliberation to ensure that the Agencies' rules accurately account for these resources' characteristics and implement CETA's requirements.

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

Irrespective of its location and configuration, a storage resource is not a "generator" capable of generating electrical energy, and consequently the electrical energy delivered by storage cannot create RECs. While currently, the type or technology, value streams, interconnection, dispatch characteristics and location of resources would be informative, it is important to understand that

in a future resource mix, energy storage resources may be allowed to be more flexible. For example, energy storage devices may be required to charge from the grid, or prohibited from doing so, in order to provide specific benefits to the grid. In a highly decarbonized system (greater than 70%), the former rings true because storage resources located closer to the load may function as a better asset than even a hybrid resource located farther from load for the purpose of meeting clean energy targets. Some potentially lucrative energy services markets, such as frequency regulation, may require that energy storage devices charge from the grid on a sub-hourly basis in order to participate. While those value streams may not fit under the REC framework, storage resources should be assessed fairly in integrated resource plans to ensure that their multiple value streams are accounted for in portfolio selection. *It is important to note that while CETA puts us on a path towards achieving that system, we are not in that position yet*. Thus, standalone storage resources should not technically be permitted to generate RECs until and unless the fuel mix is significantly dominated by clean and non-emitting resources that do not themselves produce RECs.

In the case of hybrid or co-located resources which contain storage as one of the resources associated or paired with a renewable resource behind a POI, only the renewable component of that combined resource is capable of generating RECs. Pulling storage out of the REC equations simplifies the framework considerably and ensures that only electrons generated from renewable energy sources are allowed to generate the associated non-power attributes.

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?**

Since energy storage resources do not "generate" electrical energy, they should not be treated as a "generation resource" in WREGIS for the purpose of REC creation, compliance, and accounting in CETA and thus should be left out of the calculation altogether. This would avoid double-counting the RECs generated from the renewable resource and later dispatched through the storage component. For a hybrid resource with a single resource ID behind a POI, meter or measure the output in MWhs <u>generated</u> by the renewable energy facility including the energy delivered to charge the storage component for the purpose of REC creation, reporting, and compliance. For a co-located resource with multiple resource IDs behind a POI, meter or measure the MWhs <u>generated</u> solely by the renewable component at the POI for the purpose of REC creation, reporting, and compliance irrespective of whether the energy is charging the storage or not. Charging and discharging the associated storage resource should not have any effect on the amount and value of RECs since both resources can be metered separately. As mentioned previously, further discussions on losses related to storage discharge with respect to

utility's compliance obligations could be helpful to ensure that the RECs associated with the renewable energy generated and delivered to the storage are correctly accounted for.

3. **Should compliance and reporting rules related to energy storage be differentiated based on any of the following: a. The storage technology, such as battery storage or pumped hydro 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? c. The ownership of the storage resource, such as a utility subject to CETA, a nonutility operator, or a retail end use customer. If the answer to any of these subparts is yes, please explain why and provide suggested rule language.**

Irrespective of the technology, location and ownership, storage resources should not be classified as generators in WREGIS and thus should not be allowed to generate RECs. In the case of storage resources paired with renewable generation behind a POI, the rules related to accounting of non-power attributes like RECs should be addressed to ensure that only the MWhs generated by the renewable resource are capable of creating the associated non-power attributes.

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.**

While an energy storage resource can behave like a generator or like a distribution asset depending on the type of storage, where it is deployed, how it is used, and who controls it, it ***does not*** inherently generate electricity and thus should not be classified as a "generator". It behaves like a generator when it is discharging but technically it is ***only shifting the time of delivery of electricity that was previously produced*** based on how it is controlled and dispatched. If interconnected at the distribution level (especially behind the customer meter) storage may be viewed by customers as a way to increase the usefulness of renewable energy and to provide on-site reliability. Another consideration which sets apart storage is that generators generally do not consume energy (except for station service), whereas storage assets can consume a significant amount of energy to charge. The fact that storage devices both absorb and

discharge electricity makes them difficult to categorize but also essential to meeting CETA's clean energy requirements.

Storage resources should technically *not* be registered with the WREGIS because they do not have the ability to generate electricity by itself but can deliver electricity generated previously by storing and dispatching at a later time period. Specifically in the case of standalone storage, the origination of electricity that is charging the storage is impossible to identify. If we consider the physics of the system, once electricity is generated from a power plant and supplied to the grid through a substation and eventually via transmission and distribution lines, they are essentially electrons- indistinguishable and equal in all aspects. Because they are indistinguishable, the source of electricity used to charge the storage resource is nearly impossible to determine. Additionally, a storage resource charging from the grid may have double-counting implications since a share of the energy used to charge a storage system may come from renewable resources which already have a REC associated with that MWh of electricity. Thus, standalone energy storage resources should not be classified as a "generator" of energy and RECs. For hybrid or co-located resources wherein the storage is capable of grid-charging, irrespective of the coupling, RECs are only created when a renewable resource generates electricity and should be measured accordingly. This would preclude the storage resource from being registered in WREGIS.

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

RECs will be created for each MWh of electricity generated using renewable energy sources irrespective of whether that electricity is delivered directly to the grid or being used to charge a storage resource behind a common POI. As mentioned previously, there are multiple configurations of co-located resources wherein a renewable generating facility shares a point of interconnection with the storage.

Coming to the second question, referring to the previous discussions on the different configuration of co-located and hybrid resources, for storage resources that are able to charge from both the renewables and the grid in a co-located setting i.e. with multiple resource IDs, solely allowing and accounting for REC created for the renewable generation would ensure an appropriate accounting of RECs. Thus, storage charging from the grid would not have any impact on the number of RECs created by the renewable resource because it is not part of the non-power attribute calculation. For hybrid resources with a single resource ID, if the storage is

capable of charging from the grid, *subtract or net* the amount of MWhs inputted into the storage from the output to calculate the RECs.

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?**

No comments on this for now.

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?**

In the case of both hybrid and co-located resources, month and year vintage information would be sufficient to ensure that renewable energy claims are accurate since only the renewable component is "generating" electricity and its associated RECs. Typically, month and year information allows enough flexibility to account for the operational characteristics of these resources.

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?**

Since there is no practical way in which we can decipher the source and composition of electricity being used to charge standalone storage resources at any point of time, there isn't a conceivable avenue to verify, document, and calculate the portion of electricity that is renewable or nonrenewable. Allowing standalone storage facilities to generate RECs based on approximate calculations would lead to a convoluted and incorrect path of accounting and complying with the stipulations stated in CETA. In the case of hybrid and co-located resources, our previous responses provide detailed information regarding the calculation of RECs.

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?**

There are multiple states or jurisdictions with specific rules related to storage accounting pertaining to co-located or hybrid resources. One such example is California Energy Commission's RPS reporting guidebook[2] which states:

> energy storage technologies, including pumped storage hydroelectric, are not inherently renewable as they are not dependent on the use of a renewable energy resource. However, an energy storage device may be considered an addition or enhancement to an eligible renewable facility that is either integrated into the renewable facility or is directly connected to ensure that any input from the grid is accounted for.

It also states that "a facility certified as RPS-eligible may include an electricity storage device if it does not conflict with other RPS-eligibility criteria, but the storage unit itself will not be separately certified."

Additionally, regarding pumped-hydro resources, it states that:

> Energy storage technologies using pumped storage hydroelectric may qualify for RPS if 1) the facility meets the eligibility requirements for conduit hydroelectric, small hydroelectric, or incremental hydroelectric facilities, and 2) the electricity used to pump the water into the storage reservoir qualifies as RPS-eligible. The amount of energy that may qualify for the RPS is the amount of electricity dispatched from the pumped storage facility.

III. CONCLUSION

Energy storage resources will likely play a pivotal role in achieving the mandatory standards set by Washington's Clean Energy Transformation Act. The characterization of such resources in a fair and scientific manner will be essential to ensure that any rulemaking related to these resources is appropriately designed. We look forward to engaging further as the "use" conversation unfolds and in the upcoming workshop on this issue currently scheduled for June 22, 2021.

[2] California Energy Commission : RPS Eligibility Guidebook Ninth Edition. https://www.energy.ca.gov/programs-and-topics/programs/renewables-portfolio-standard/renewables-portfolio-standard-0

Sincerely,

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