BEFORE THE PUBLIC UTILITY COMMISSION OF OREGON

AR 616

In the Matter of	:	
	:	COMMENTS OF RENEWABLE
Rulemaking related to Renewable	:	NORTHWEST
Portfolio Standard Planning Process and	:	
Reports	:	**June 30, 2020**
	:	

I. INTRODUCTION

Renewable Northwest appreciates the opportunity to comment on the meaning of "associated energy storage" in SB 1547 (2016) as the Oregon Public Utility Commission ("OPUC" or "Commission") undertakes rulemaking relating to Oregon's Renewable Portfolio Standards ("RPS"). In these comments, we address Staff's questions, ultimately recommending that the Commission adopt rule language requiring that "associated energy storage" projects eligible for cost recovery via an automatic adjustment clause be limited to storage resources co-located with RPS-eligible renewable resources such that the resources share a point of common coupling. Requiring co-location would help the Commission to avoid overly complex inquiries into resources' operating characteristics, to limit the possibility that "associated energy storage" will inadvertently end up increasing load served by greenhouse gas-intensive fossil generators, and to uphold the policy goals of the SB 1547, Oregon's RPS statute, and the greenhouse-gas emission reduction targets established in Governor Brown's Executive Order 20-04.

II. COMMENTS

In 2016, the Oregon Legislature passed SB 1547, commonly known as the "coal-to-clean" bill. Section 11 of the bill addresses "Recovery of Costs for Complying with Renewable Portfolio Standard" and, among other things, provides that:

> (2)**(a)** The Public Utility Commission shall establish an automatic adjustment clause as defined in ORS 757.210 or another method that allows timely recovery of costs prudently incurred by an electric company to construct or otherwise acquire facilities that generate electricity from renewable energy sources [*and for*]**, costs related to** associated electricity transmission **and costs related to associated energy storage**.

The Commission opened Docket No. AR 616 in April 2018 to update the rules regarding utility RPS implementation plans and compliance reporting, and to define the term "associated

energy storage" for purposes of utility cost recovery.[1] Since then, Renewable Northwest has engaged in Commission workshops in this docket, and on March 19, 2019, we filed comments in response to Staff's February 26, 2019 Request for Comment.

In our March 19, 2019 comments, we supported this rulemaking as a vehicle for defining the term "associated energy storage."[2] We further commented that "it is appropriate to establish a definition of associated energy storage that ensures utilities may recover the costs of related investments" for the high-level reason that "associated energy storage may provide net benefits and thereby reduce the incremental cost of RPS compliance."[3] However, we also noted that "not all storage is designed to support renewable energy generation and integration" and offered that, at the time, "the best method we [were] aware of to ensure that an energy storage facility is truly associated with renewable energy generation ... is use of colocation as a proxy."[4]

On June 19, 2020, Commission Staff released a new Request for Comments from Stakeholders raising four questions designed to help the Commission to define "associated energy storage." In these Comments, we respond to Staff's four questions.

1) What was the purpose of including 'associated energy storage' in the language SB 1547? What facts or policy reasons support your position?

The best evidence for the purpose of including "associated energy storage" in the language of SB 1547 is the general policy context within which that bill was passed and the specific statutory context in which the legislature included the term "associated energy storage."

As to general policy context, Renewable Northwest's testimony on HB 4036 (2016), the original coal-to-clean bill before SB 1547 became the vehicle for that bill's policy, explained that the bill "captures the will of the people to clean up our energy supply and puts us firmly on a path to grow our generous endowment of renewable energy resources to meet our needs."[5] Overall, the bill focused on phasing out the coal-fired resources that the region had traditionally relied on to meet not just energy but also capacity needs, and phasing in renewables as future resources to meet those needs -- hence the "coal-to-clean" moniker.

As to specific statutory context, again Section 11 of SB 1547 was titled "Recovery of Costs for Complying with Renewable Portfolio Standard." That section amended ORS 469A.120, which is housed within the chapter of the Oregon Revised Statutes that establishes Oregon's RPS, and which in turn is titled "Cost recovery by electric companies." The purpose of both Section 11 and ORS 469A.120 is to provide certainty for utilities that they can recover costs related to RPS implementation. Specifically, ORS 469A.120(1) provides:

> Except as provided in ORS 469A.180 (Electric companies) (5), all prudently incurred costs associated with complying with ORS 469A.005 (Definitions) to

[1] Docket No. AR 610, Order No. 18-128 (Apr. 12, 2018).
[2] Mar. 19, 2019 Comments of Renewable Northwest at 5.
[3] *Id.* at 5-6.
[4] *Id.* at 6.
[5] Testimony of Rachel Shimshak, Executive Director, Renewable Northwest, Senate Committee on Business and Transportation, Supporting HB 4036A (Feb. 17, 2016), *available at* https://olis.leg.state.or.us/liz/2016R1/Downloads/CommitteeMeetingDocument/88092.

> 469A.210 (Goal for community-based renewable energy projects) are recoverable in the rates of an electric company, including interconnection costs, costs associated with using physical or financial assets to integrate, firm or shape renewable energy sources on a firm annual basis to meet retail electricity needs, above-market costs and other costs associated with transmission and delivery of qualifying electricity to retail electricity consumers.

Following SB 1547, ORS 469A.120(2)(a) includes "associated energy storage" as an RPS-related cost recoverable via a special mechanism called an "automatic adjustment clause." This context makes it clear that "associated energy storage" as it appears in SB 1547 and ORS 469A.120 must be "associated" with RPS-eligible renewable resources.

That background, though, raises the question of what it means for storage to be "associated" with a renewable resource. Turning to more technical considerations, the term "associated energy storage" used in conjunction with renewable energy resources essentially requires the energy storage system to be paired with the renewable energy system either physically or operationally. The hybrid resources that are currently available on the market typically can be realized in four different configurations, each having its own operational and physical characteristics. These configurations are described here:

1. *Independent*

This resource type typically does not have a point of common coupling[6] meaning that the renewable energy system and the energy storage system are not situated at the same site. The energy storage system can be charged from the grid directly or through a "virtual" renewable resource via bilateral market transactions.

2. *AC-Coupled*

This resource type involves physical co-location of the renewable resource and the energy storage system and shares a point of common coupling on the AC grid either on the transmission or feeder level. Because both resource elements -- renewable and storage -- do not share any components, the storage can still act as an "independent" resource meaning it can charge from the renewable resource and the grid.

3. *DC- Coupled*

This resource type also involves physical co-location of the renewable resource and the energy storage system but differs from AC-Coupled system in the point of common coupling. Here, the renewable resource and the energy storage resource are coupled on the DC side of a shared bi-directional inverter, a configuration that allows the storage to be charged from the renewable resource as well as the grid.

[6] Point of common coupling or "PCC" means the point where the generating facility's local electric power system connects to the electrical company's electric system, such as the electric power revenue meter or at the location of the equipment designated to interrupt, separate or disconnect the connection between the generating facility and electrical company/utility. The point of common coupling is the point of measurement for the application of IEEE 1547, clause 4.

4. *DC Tightly Coupled*

This resource type is similar to the DC-Coupled system with the only difference being that the bi-directional inverter is replaced by a uni-directional inverter to only allow charging from the renewable resource to be considered for the Investment Tax Credit (ITC).

The values and the costs of hybrid resources usually depend on their coupling characteristics. Greater physical or operational coupling usually leads to greater value in shifting renewable energy to peak load times by storing that energy in the storage resource. Similarly, greater physical or operational coupling also generally leads to lower costs due to simpler application of ITC eligibility criteria. The full ITC, currently 26%, may only be applied to a developer's capital expenditure on a hybrid system if the storage is charged "primarily" from renewable energy resources. The ITC allows upto 25% grid charging with prorated rates then applied to the "26%" tax credit[7] depending on how much energy is charged from renewables. A hybrid system is thus eligible to reduce 19.5-26% of its total capital expenditure based on the proportion of storage capacity charged from renewable energy. Independently located hybrid resources are not allowed to capture this tax credit unless proven contractually, which we understand to be a fairly complex and uncommon practice. Co-located resources thus provide benefits both operationally and financially by easily shifting renewable energy from low load hours to high load hours and the allowing for easy application of tax credits that reduce financial burden on utilities and thus, ultimately, customers.

2) Should the administrative rules require 'associated energy storage' to be located on the site of a renewable resource? What legal or policy reasons support your position?

Renewable Northwest recommends that the rules require "associated energy storage" to be co-located with a renewable resource or resources in order to qualify for the automatic adjustment clause.

While it may not be strictly *necessary* to require associated energy storage to be located on the site of a renewable resource, it is essential that the operational characteristics of the hybrid system are clearly defined in order to support Oregon's climate and energy policy. To do so without invoking co-location as a proxy could be overly complex and challenging. As mentioned previously, storage systems may be located away from the renewable resource as long as a utility can clearly provide detailed operational characteristics demonstrating that they are being charged from renewable energy through either the grid or virtual bilateral market transactions. Storage that is not operationally tied to a renewable resource can charge from available fossil fuel energy, a result that would be counterproductive to the policy and practice of the RPS as well as potentially increasing costs to customers due to unavailability of federal tax credits.

Additionally, co-located hybrid resources provide several operational benefits. Firstly, co-located resources can reduce project costs since these systems use common Balance of System (BoS)

[7] Federal Tax Incentives for Energy Storage Systems. https://www.nrel.gov/docs/fy18osti/70384.pdf.

components like power inverters and converters. Secondly, co-located resources (DC-coupled) can also take advantage of otherwise lost "clipped" energy due to interconnection limits by storing it for later use and low-voltage harvesting periods when inverters cannot generate enough power from the renewable energy resource. Thirdly, co-located resources provide project construction synergies including shared permitting and siting costs and shared interconnection agreements. Increased transmission utilization by co-located hybrids can also reduce transmission costs.[8] Finally, co-located resources provide a better technical understanding of the storage charge/discharge characteristics and the eventual operation of the hybrid resource to meet peak loads or provide ancillary services. Recent analysis from the National Renewable Energy Laboratory (NREL)[9] has proven that the benefit-cost ratios of hybrid resources increase as the level of coupling increases, with DC tightly coupled systems showing the highest benefit cost ratios. Co-location also leads to 8-10% reduction in capital costs compared to independently sited systems. Given that the definition of "associated energy storage" in this proceeding is tied to utility cost recovery, it is particularly appropriate to focus on the relative costs of different hybrid configurations.

Renewable NW believes that co-locating storage with renewable resources provides operational and financial benefits that outweigh the benefits from independently location of storage and renewables, especially given the intent behind SB 1547, the RPS, and more recently Governor Brown's Executive Order 20-04 centering greenhouse gas reduction as a key policy consideration for the Commission. Independent location leads to significant questions as to how and when a storage resource is charged, leading to other operational and contractual complexities as well as risks and uncertainties associated with the potential to charge from fossil fuel energy. These risks could be avoided if the Commission establishes rule language requiring co-location for "associated energy storage" and further addressing operational characteristics to ensure charging from renewable resources. This approach would be beneficial for project developers, utilities, and customers.

3) How else might energy storage be connected to renewable energy resources?

As discussed previously, energy storage may be independently located away from the renewable energy resources and be charged via grid energy "virtually" from a specific source via bilateral market transactions. Unless sourced from a specific bilateral market transaction, it would be difficult to determine the exact source of the energy, i.e. whether it is from a renewable resource or not. This result not only could undermine Oregon's climate and energy policy goals but also could create uncertainty and added complexity in proving eligibility for tax credits and could prevent off-peak and clipped energy from being stored (a use case that is possible when the renewable resource and storage system are co-located).

[8] Gorman et al 2020. *Motivations and options for deploying hybrid generator-plus-battery projects within the bulk power system.*
[9] Denholm et al 2017. *Evaluating the Technical and Economic Performance of PV Plus Storage Power Plants* https://www.nrel.gov/docs/fy17osti/68737.pdf

4) Besides co-location, what metrics are available for determining if energy storage is associated with a renewable energy resource?

Physical co-location of renewable energy resources with energy storage does not explicitly define the resulting hybrid resource's operational characteristics or qualify it for the tax benefits available to hybrid resources. The most suitable metric available for determining the "association" is the point of common coupling also referred to as point of interconnection. The point of common coupling can either be on the AC side of the inverter, i.e. transmission or feeder, in the case of AC-coupled systems or can be on the DC side of the inverter in the case of DC-coupled systems. Requiring co-located resources with a point of common coupling would ensure that an associated storage system eligible for cost recovery via an automatic adjustment clause is most likely to be charged from an RPS-eligible renewable resource and would provide tangible support for its eligibility to apply for the sizable ITC.

III. CONCLUSION

Renewable Northwest thanks the Commission and Staff for consideration of these comments and looks forward to continued participation in the RPS rulemaking process.

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