

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

UM 1751

In the Matter of

PUBLIC UTILITY COMMISSION OF  
OREGON,

Implementing Energy Storage Program  
Guidelines pursuant to House Bill 2193.

NATIONAL GRID'S MOTION TO  
INTERVENE OUT OF TIME,  
PETITION TO INTERVENE, AND  
COMMENTS

National Grid plc ("National Grid") respectfully requests that the Public Utility Commission of Oregon ("Commission") accept this Motion to Intervene out of Time, Petition to Intervene, and Comments in the above captioned proceeding.

**Motion to Intervene Out of Time**

Pursuant to OAR 860-001-0420, National Grid hereby moves for permission to intervene out of time in the above-captioned proceeding. National Grid's Petition to Intervene is set out below.

Granting this Petition for late intervention will not unreasonably delay the proceeding, nor will it prejudice the rights of any other party to this proceeding. National Grid is considering energy storage opportunities throughout the Western United States and is interested in several energy storage opportunities within Oregon, as well as other Western states. As a result, National Grid has a direct interest in the outcome of this proceeding that cannot be adequately represented by any other party.

Under the Commission’s rules, if the Commission determines that an interested party has a sufficient interest in the proceedings, and the party’s appearance and participation will not “unreasonably broaden the issues, burden the record, or delay the proceedings,”<sup>1</sup> then the Commission must grant the petition. As noted in its Petition to Intervene below, National Grid represents that, if it is granted intervenor status, its participation will not unreasonably broaden the issues, burden the record, or delay the proceedings. Rather, National Grid merely seeks to provide additional clarification and input on issues already raised in the proceeding, and to have the opportunity to participate in the further development of Oregon’s energy storage policies.

### **Petition to Intervene**

National Grid petitions to intervene in this proceeding, and in support of this Petition, states as follows:

1. The contact information (name, address, e-mail address) for National Grid is:

National Grid plc  
Attn: Nathan Sandvig  
205 SE Spokane Street, Suite 300  
Portland, OR 97202  
[Nathan.Sandvig@nationalgrid.com](mailto:Nathan.Sandvig@nationalgrid.com)

2. The names and addresses of the persons to be included on the official service list in this docket are:

Nathan Sandvig  
Director, Business Development  
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<sup>1</sup> OAR 860-001-0300(6).

3. National Grid is a Fortune 500 company and one of the largest investor-owned energy companies in the world, with a market capitalization of over \$50 billion. National Grid has utility operations in both the United Kingdom and the United States. National Grid is actively engaged in the development of bulk transmission and bulk storage assets to enable the transition of the United States' electric system to a low-carbon grid.

4. As a company, National Grid is technology agnostic, and is considering various energy storage opportunities throughout the Western United States, including within the state of Oregon. Among other technologies, National Grid is interested in pumped storage hydroelectric projects and the ability of these projects to support other renewable energy technologies as an integration tool at the necessary scale to stabilize the variable output from renewable energy resources.

5. National Grid intends to participate as a party in this proceeding to raise any pertinent issues.

6. National Grid has special knowledge and expertise that would assist the Commission in resolving the issues in this proceeding, particularly on the subject of pumped storage hydroelectric facilities. National Grid has vast experience and expertise in balancing the electricity system and ensuring electric markets run efficiently, and this experience and expertise would provide a unique and important voice to this discussion.

7. Based on the information provided above, and in accordance with the Commission's rules of procedure, National Grid hereby requests to participate in this proceeding as an intervenor. National Grid will not unreasonably broaden the issues, burden the record, or unreasonably delay the proceeding. *See* OAR 860-001-0300.

8. National Grid therefore respectfully requests that the Commission grant its Petition to Intervene out of Time.

## Comments

Although National Grid recognizes that the Commission has already issued an order in this proceeding adopting the guidelines and requirements to implement House Bill 2193 (HB 2193),<sup>2</sup> National Grid provides these comments in response to a recent workshop held by Commission staff on January 27, 2017, wherein Commission staff requested comments on materials discussed and distributed at that workshop. Therefore, National Grid provides these comments in response to that request from Commission staff.

National Grid appreciates the opportunity to provide these comments. National Grid is very supportive of and encouraged by the Commission's proceeding and exploration of energy storage as a vehicle to overcoming the regulatory, operational, and market challenges of broader adoption of renewable energy to achieve our region's clean energy goals efficiently and cost-effectively. Taking into account the broader, highly-fragmented regional electric system beyond each utility's specific need, National Grid is particularly interested in the language of HB 2193 that waives the capacity cap of this relatively small legislative mandate if one or more electric utilities participate in procuring a storage system of statewide significance.

The Pacific Northwest Electric Power and Conservation Planning Council's ("NWPPC") Seventh Conservation and Electric Power Plan (the "7<sup>th</sup> Power Plan")<sup>3</sup> provides guidance to its member states of Oregon, Washington, Idaho, and Montana regarding which resources will ensure a reliable and economical regional power system for the next 20 years. NWPPC's 7<sup>th</sup> Power Plan, and upcoming 8<sup>th</sup> Power Plan process, is the closest proximity to a regional integrated planning process. In particular, the 7<sup>th</sup> Power Plan calls for a white paper on the "full

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<sup>2</sup> See *In the Matter of Public Utility Comm'n of Oregon, Implementing Energy Storage Program Guidelines pursuant to House Bill 2193*, Docket No. UM 1751, Order 16-504 (Dec. 28, 2016).

<sup>3</sup> See *NWPPC Seventh Conservation and Electric Power Plan*, available at: <https://www.nwcouncil.org/energy/powerplan/7/plan/> (the "7<sup>th</sup> Power Plan").

value stream of energy storage and its role in the power system, including transmission, distribution, and generation.”<sup>4</sup> NWPPC notes that, “One of the potential constraints to extensive storage development is the ability of the developer and/or investor to capture and aggregate the full value of the storage system’s services in a non-organized market and transform interest and overall system need into revenue streams and project funding.”<sup>5</sup> Therefore, like the effort being undertaken by NWPPC to further investigate the full value of energy storage, National Grid believes the Commission’s analysis and guidelines in this proceeding should also take into account the full value of energy storage, including things like portfolio effect for an optimized regional system, ability to provide different types of balancing services such as regulation up, regulation down, frequency or voltage regulation, life-cycle benefits and costs associated with specific storage technologies, and costs associated with equipment degradation and replacement.

Combining cost-effective, technologically proven, environmentally sound, utility-scale energy storage integrated with renewables holds great promise to enable the regional transmission grid to transition the electric system to a low carbon grid. Specifically, National Grid believes that 21<sup>st</sup> century hydropower and proven “closed-loop” pumped storage hydropower can serve as an important tool to unlock the greater value of existing and future renewables and best manage the massive operational challenges created by Oregon and California’s 50% Renewable Portfolio Standard and beyond.

The Western United States has several very attractive, viable “closed-loop” sites strategically located with convenient access to the western bulk transmission system (*i.e.*, AC-DC Interties). These sites are particularly suitable for pumped storage. For example, Swan Lake in southern Oregon and the JD Pool Project in southern Washington are two examples of sites

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<sup>4</sup> *Id.* at Chapter 4, ANLYS-16.

<sup>5</sup> *Id.*

that are particularly attractive for closed-loop pumped storage hydroelectric projects. Pumped storage hydroelectric projects provide many benefits, including critical grid reliability and balancing services, carbon-free flexible capacity, and significant economic development for the region.

While the Commission's staff has indicated some desire for this process to be technologically neutral, National Grid is concerned that, at this juncture, the discussion has become essentially a battery discussion and is ignoring other storage technologies such as pumped storage hydroelectric facilities. National Grid urges the Commission to take steps to assure that this important storage discussion does not prematurely focus on battery technology.

While battery storage should play a role in Oregon's energy storage future, National Grid believes that batteries should be carefully considered against other storage and generation alternatives, such as pumped hydro storage. Further, it is imperative that the Commission consider the full value of the different types of storage technologies. For example, when comparing batteries and pumped hydro storage facilities, the Commission should consider technology degradation and life-cycle issues. Some sources suggest that batteries tend to degrade at a much faster rate than pumped storage facilities, thus requiring significant repair or replacement costs every 5-10 years.<sup>6</sup> Additionally, upon replacement of degraded facilities, there is a potential for significant environmental costs associated with the waste and disposal of batteries that are beyond repair or unable to be reused.

A recent study by Lazard compares the relative costs and benefits of the different storage technologies. In particular, Lazard released an update to its "Levelized Cost of Storage" analysis that looks at the comparative costs per megawatt hour ("\$/MWh") for different types of storage

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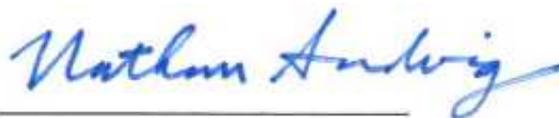
<sup>6</sup> See, e.g., Lazard, *Levelized Cost of Storage Analysis 2.0* at 9, available at: <https://www.lazard.com/media/438042/lazard-levelized-cost-of-storage-v20.pdf>.

technologies.<sup>7</sup> Lazard’s analysis concludes that, for purposes of large-scale storage systems to incorporate into the transmission grid (which Lazard defines as those aimed at improving grid performance and assisting with the integration of utility-scale renewable resources), pumped storage hydro facilities outperform batteries when considering both: (1) the levelized cost of storage for each technology, and (2) the capital costs associated with each type of facility.<sup>8</sup>

As a follow-up to the Commission’s workshop held on January 27, 2017, National Grid would like the opportunity to participate in the agenda for any future workshops. National Grid’s participation in future workshops would allow it to contribute its valuable expertise and experience to the workshop. More specifically, National Grid’s participation would allow it to educate the Commission and its staff on storage issues generally, and pumped storage hydroelectric issues specifically, as well as the specific proposed projects in the region, and provide more information about this mature technology, its value to the grid, and benefits. Additionally, National Grid is willing to hold a separate educational meeting with the Commission or its staff, if that would be helpful.

Dated this 7<sup>th</sup> day of February, 2017.

Respectfully submitted,



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Nathan Sandvig  
Director, Business Development  
National Grid plc

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<sup>7</sup> *Id.*

<sup>8</sup> *Id.* at 11, 17 (comparing costs in the “Transmission System” scenario for different types of storage technologies).