

September 25, 2015

VIA ELECTRONIC FILING

Steven V. King
Executive Director and Secretary
Washington Utilities and Transportation Commission
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Olympia, Washington 98504-7250

RE: Docket UE-151069—Pacific Power & Light Company’s Comments

In response to the Washington Utilities and Transportation Commission’s (Commission) August 7, 2015 Notice of Recessed Open Meeting and Workshop and Notice of Opportunity to File Written Comments (Notice), Pacific Power & Light Company, a division of PacifiCorp (Pacific Power or Company), submits these comments regarding energy storage modeling in integrated resource planning.

Staff’s White Paper raised many important issues regarding the barriers that Washington utilities face in energy storage development and the challenges of modeling energy storage in current planning and procurement processes. Pacific Power agrees that there is still much work to be done in exploring the issues surrounding energy storage modeling, and appreciates the opportunity to participate in these discussions.

The Commission requested written comments to address specific questions outlined in the Notice. The Company addresses each of these questions in detail below.

- A. The following list identifies some of the potential uses, benefits or “value propositions” that energy storage systems could offer to a utility. How should a utility model such benefits in an IRP or resource procurement process?**
- 1. Peak Shaving**
 - 2. Transmission and Distribution Upgrade Deferrals**
 - 3. Outage Mitigation**
 - 4. System Balancing**
 - a. Regulation/Frequency Control**
 - b. Load Following**
 - c. Energy Imbalance**
 - 5. Contingency Reserves**
 - 6. Reactive Power Support**
 - 7. Network Stability Services**
 - 8. System Black Start Capability**
 - 9. Other**

The Company participated in the Commission's August 25, 2015 recessed open meeting on energy storage in utility integrated resource planning and procurement, and found the presentation materials and associated discussion to be very informative. Consistent with its comments at this meeting, the Company recognizes that traditional integrated resource plan (IRP) modeling tools may not adequately capture the full range of potential benefit categories that can be attributable to specific energy storage system applications. Consequently, the Company plans to evaluate analytical methods and modeling tools, such as the Battery Storage Evaluation Tool (BSET) developed by the Pacific Northwest National Laboratory that can supplement traditional IRP models when assessing energy storage systems within IRP and procurement processes.

While the Company has not yet finalized a formal modeling plan to integrate supplemental analytical methods and modeling tools into its IRP and procurement processes, the Company has considered, conceptually, how this might be achieved. In its most simplistic form, supplemental analytical methods and modeling tools can be used to quantify energy storage benefit categories that are not captured in the traditional IRP modeling framework. These incremental benefits could be applied as a reduction in the cost of energy storage system technologies during the portfolio selection process. This approach may require developing generalized incremental benefit assumptions for specific storage technologies available at specific locations within the Company's system. Alternatively, incremental benefit assumptions can be developed for specific sites. This information can be reported in the IRP document and be used to better assess energy storage resources.

B. Models are available today that assign values to the many different use cases of a storage system. These models optimize the value of a storage system by selecting the service that provides the most benefit to the utility and consumers at a particular moment. What technical capability do the utilities have to perform similar modeling? Given that planning in Washington focuses on least-cost, least-risk resource analysis, how could utility resource plans best analyze and incorporate such analysis into existing IRP and resource procurement models?

The Company is working to identify potential sites where battery storage may be beneficial, focusing on sites where multiple benefit categories, including benefits associated with the Company's participation in the energy imbalance market, might apply. The Company is also working to obtain battery storage evaluation tools that can be used to evaluate specific projects. In the near future, the Company will consider both the Oregon Request for Grant Applications for utility-scale storage projects and Washington's Clean Energy Fund grant for an energy storage and/or renewable project. The Company will also be exploring options to procure an energy storage system of at least five MWh by January 1, 2020, as required by Oregon House Bill 2193.

The Company is working on developing a standardized process to evaluate energy storage projects. To this end, PacifiCorp is working to obtain the PNNL Battery Storage

Evaluation Tool. PacifiCorp has also looked at the U.S. Department of Energy (DOE) Energy Storage Computational Tool Version 1.2 (ESCT) that was developed by Navigant. The current evaluation process assumes that capital deferral is the greatest benefit category, and involves the following steps:

- 1) Analyze applicable load curves to determine how much energy storage (in MWh) is required to provide the same benefit as the traditional upgrade method. If the primary value stream is something other than capital deferral, then a different analysis may be needed to size the battery system.
- 2) Apply a cost estimating model developed by Black & Veatch to estimate the battery system cost.
- 3) Add owner's costs and other costs not included in the Black & Veatch model.
- 4) Enter battery system characteristics, costs, and associated assumptions into the DOE ESCT to produce a revenue stream.

Once this process is refined, it can be used to evaluate battery storage as an option for all applicable capital projects.

C. Utilities, as balancing authority areas, currently provide ancillary services. As balancing authorities, what ancillary services are the utilities responsible for providing? What resources do utilities currently use to provide ancillary services? What are the costs associated with using these resources to provide ancillary services, and what is the opportunity cost of using the resources to provide ancillary services? Would it be appropriate for Washington to use rates for ancillary services in organized electricity markets as a proxy for valuing the ancillary benefits of energy storage in Washington?

Ancillary Services are those generation-based services that are necessary to support the transmission of energy from resources to loads while maintaining reliable operation of a transmission system in accordance with good utility practice.

Ancillary Services normally include:

- Reactive Supply and Voltage Control from Generation Sources
- Regulation and Frequency Response
- Energy Imbalance
- Operating Reserve—Spinning
- Operating Reserve—Supplemental

Resources used to provide ancillary services are typically those that can provide quick response to changes in generation and load, i.e., those that can increase and decrease generation on an instantaneous and/or momentary basis. Hydro or fast responding thermal resources generally act as good resources for providing ancillary services.

The costs associated with providing ancillary services from resources are primarily fuel, transportation and/or transmission, operations and maintenance, and debt service including taxes. The opportunity costs for using resources to provide ancillary services can be the market opportunity or serving native load.

Using rates for ancillary services in organized markets as a proxy for valuing ancillary services benefits from energy storage may provide an approximation of the value. However, each resource or energy storage project will have their unique costs and valuing them from a market proxy may result in over or under recovery of their actual costs.

D. What additional questions should the Commission consider in the course of this investigation?

The Commission has identified a robust set of questions for this investigation. In addition to the comments above, the Company requests that the Commission allow for flexibility in how utilities evaluate energy storage resources in their IRP and procurement processes. Each utility has unique system characteristics, data, and existing modeling tools that will influence solutions for improving how energy storage technologies can be analyzed.

Pacific Power appreciates the opportunity to provide these comments and looks forward to further participating in this proceeding.

Please direct inquiries to Ariel Son, Manager, Regulatory Projects, at (503) 813-5410.

Sincerely,

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