

April 3, 2017

VIA ELECTRONIC FILING

Steven V. King
Executive Director and Secretary
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Drive S.W.
P.O. Box 47250
Olympia, WA 98504-7250

**RE: Docket U-161024 and UE-151069—Pacific Power & Light Company’s Comments
Draft Report and Policy Statement on Treatment of Energy Storage Technologies in
Integrated Resource Planning and Resource Acquisition**

In response to the Notice of Opportunity to File Written Comments issued by the Washington Utilities and Transportation Commission (Commission) on March 3, 2017, Pacific Power & Light Company (Pacific Power or Company), a division of PacifiCorp, submits these written comments.

PacifiCorp commends Staff and the Commission for the amount of work and detail in developing the draft policy statement on the treatment of energy storage technologies in integrated resource planning and resource acquisition. The Company looks forward to continuing to work with Staff and stakeholders to evaluate the benefits and regulatory treatment of energy storage.

A. Changing Planning Paradigms

With observed, and potential on-going advancements in the cost and performance characteristics of energy storage systems, resource planning paradigms must evolve to study how these resource alternatives might be used to reduce customer costs, improve reliability, and/or mitigate risk. Planning to serve the diverse and variable needs of our customers at the distribution level is distinct and separate from the established long-term resource planning process performed through the Integrated Resource Plan (IRP). However, advancements in the methods used to value energy storage systems at the distribution level can be applied to improve the methods used to value utility-scale energy storage systems in the IRP. Similarly, studies used to inform cost and performance of specific energy storage system technologies, traditionally performed within the IRP, can be applied to analysis of energy storage systems at the distribution level.

Pacific Power currently evaluates the economics of specific energy storage projects, with a focus on distribution-level applications outside of the IRP process. In this context, Pacific Power considered procuring an energy storage project in Washington under the Clean Energy Fund 2, but ultimately withdrew its application. A combined energy storage plus solar project is being pursued in Utah with a targeted in-service date mid-2018. In Oregon, Pacific Power is working to meet requirements of HB 2193, which will result in proposing one or more energy storage projects in Oregon.

Pacific Power recognizes that traditional IRP-modeling tools may not capture the full range of potential benefits that may be attributable to specific energy storage applications, and methods used to estimate the value of energy storage systems is still under development. The Pacific Northwest National Laboratory (PNNL) recently developed the Battery Storage Evaluation Tool (BSET), which models up to four stacked use cases. Pacific Power is also participating in the Electric Power Research Institute's (EPRI's) Energy Storage Integration Council (ESIC) on the development of a new model called StorageVET, which recently underwent alpha and beta testing. Pacific Power is already planning to leverage work being performed to evaluate distribution-level energy storage applications, accounting for benefits from different use cases, in its IRP modeling of utility-scale energy storage applications.

The Company has and will continue to work with its stakeholders through its IRP public input process to develop energy storage sensitivities and analysis to be considered in the IRP planning cycle. In the 2017 IRP, for example, Pacific Power conducted two energy storage project sensitivities, and will continue to evaluate additional benefits of energy storage within the long-term planning process.

B. Modeling Guidelines

Modeling storage in the IRP

In the draft policy statement, the Commission stated that it expects utilities to use an external model for energy storage, and noted that there are several viable energy storage modeling tools available such as the BSET. For its 2017 IRP, which will be filed April 4, 2017, Pacific Power provides two energy storage studies—one study focused on battery technologies and a bulk energy storage study that focused on pumped hydro and compressed air energy storage. The Battery Energy Storage Study conducted by DNV-GL provides Pacific Power with a catalog of commercially available and emerging battery energy storage technologies with forecasts and estimates for both performance and cost. The Bulk Energy Storage Study prepared by Black and Veatch incorporates updated information on three pumped hydro energy storage projects and a compressed air energy storage project within PacifiCorp's territory.

The Company continues to consider how to integrate supplemental analytical methods and modeling tools into its IRP and procurement processes, and continues to evaluate analytical and modeling tools, such as the BSET, leveraging analysis of energy storage systems at the distribution level. Pacific Power recognizes that additional modeling tools and/or methods may be needed to capture potential benefits of energy storage systems, but prefers flexibility in identifying or developing these tools and/or methods. Pacific Power respectfully requests that the Commission allow for flexibility in establishing its modeling guidelines so that utilities can advance its energy storage evaluation approach while taking into consideration the potential pros and cons of specific modeling tools (i.e., cost, data, usability, availability, etc.).

Sub-hourly modeling

In the draft policy statement, the Commission raises concerns about the adequacy of traditional hourly IRP models and states that a transition to sub-hourly modeling is feasible and necessary. Pacific Power is not aware of any sub-hourly modeling tools that would accommodate the type of resource portfolio development and subsequent comparative cost and risk analysis performed

with the hourly modeling tools currently used in Pacific Power's IRP. While modeling tools may currently exist that are capable of sub-hourly dispatch analysis, PacifiCorp has observed that these tools are limited and not adequate for long-term resource planning analyses that needs to focus on a broad range of supply-side and demand-side resource alternatives over a 20-year planning horizon. At this time, it is not certain how sub-hourly modeling tools would perform (i.e., simulation run-times) if used to simulate dispatch of PacifiCorp's large and complex system over a 20-year forecast horizon. Based on Pacific Power's extensive history and experience in using simulation models to inform its long-term resource plans, the Company has found that models capable of simulating hourly system dispatch offer the most optimal balance between complexity, detail, study length, and performance.

As discussed in the Company's November 2, 2017 comments, sufficient input data must also be available to provide the most value in sub-hourly simulation models. While sufficient sub-hourly data is not currently available, Pacific Power recognizes there might be sub-hourly benefits to energy storage systems that could be evaluated in separate assessments outside of traditional IRP modeling tools that could be used to inform assumptions and assessment of utility-scale energy storage systems in the IRP. These tools may also be useful in evaluating distribution-level energy storage applications, which have to rely on very specific locational data (i.e., deferral of distribution-level upgrades) to avoid overestimating benefits.

The Company is open to exploring commercially available sub-hourly models and other methodologies to better understand how sub-hourly benefits associated with energy storage systems might influence the overall value of discrete projects, accounting for stacked benefits as discussed in the draft policy statement. It is uncertain whether sub-hourly modeling of PacifiCorp's system is reasonably achievable. If achievable, it is also uncertain whether sub-hourly models will provide reasonable/meaningful simulations of PacifiCorp's system, particularly if implemented over a 20-year planning horizon. Because of these uncertainties, Pacific Power respectfully requests that the Commission allow for flexibility in establishing sub-hourly modeling guidelines by allowing utilities to assess the potential pros and cons of specific modeling tools (i.e., cost, data, usability, availability, performance, etc.).

Stakeholder input

In the draft policy statement, the Commission expressed a need for stakeholders or IRP advisory groups to have access to the Pacific Power's analysis of energy storage project benefits from a long-term resource planning perspective. This would best be accomplished through Pacific Power's IRP public process. In that forum, stakeholders are able to provide input and request information both before and after the IRP is filed with the Commission.

C. Regulatory Treatment

The draft policy statement discusses energy storage benefits that may be difficult to quantify, such as resiliency and reliability benefits, or market transformation benefits. Pacific Power appreciates the Commission's willingness to accept a more flexible approach to evaluating these benefits for energy storage projects, but is concerned with how that uncertainty will be addressed in prudency determinations on all future resource decisions, especially if a utility is required to demonstrate that energy storage opportunities are evaluated against other options.

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Pacific Power appreciates the opportunity to provide comments on the Commission's draft policy statement and we look forward to having continued discussion about the integration of energy storage into the Company's resource planning process.

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

Sincerely,

 /s/
R. Bryce Dalley
Vice President, Regulation
Pacific Power & Light Company
825 NE Multnomah Street, Suite 2000
Portland, OR 97232
(503) 813-6389
bryce.dalley@pacificorp.com