Public Utility District No. 1 of Klickitat County

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September 25, 2015

Mr. Steven V. King
Executive Director and Secretary
Washington Utilities and Transportation Commission
1300 South Evergreen Park Drive
Olympia, WA 98504-7250

RE: Klickitat Public Utility District's Comments on Docket UE-151069, Modeling Energy Storage in Integrated Resource Planning.

Dear Mr. King:

Klickitat PUD appreciates the opportunity to comment on the Washington Utilities and Transportation Commission's ("Commission") investigation into modeling energy storage in utility integrated resource plans ("IRPs"). We support the Commission's recognizing the many benefits of all types of energy storage technologies and exploring how best to ensure that investor owned utilities consider the broad benefits of energy storage in connection with their resource planning processes. As you are probably aware, KPUD has been investigating the development of the John Day Pool pumped storage hydro project located in Klickitat County. Our experience from those efforts provides the basis of our comments.

We believe that the WUTC has identified many of the problems associated with assessing storage, like the challenge of identifying the full range of benefits of storage to an interconnected system and determining the value of those benefits and how that value can be captured by storage developers. However, KPUD is concerned that the WUTC may be overly narrow in the perspective in which these questions are addressed. We also believe that the Commission's identified list of value propositions appears to us to be appropriate, but KPUD believes restricting the analysis to a single utility, which is what the WUTC appears to propose, is overly restrictive from both an economic and environmental perspective. We believe that at this stage of analysis and inquiry, the WUTC should attempt to determine the economic and environmental benefits of storage from the perspective of an interconnected Pacific Northwest system. We encourage the Commission to take a more holistic view of the system needs and how storage can make the system (generation and transmission) run more efficiently than what appears to be under consideration.

Based upon KPUD's understanding of the analytical challenges in fully capturing the entire value stream of storage, we think that modeling individual renewable energy resources and individual storage projects using traditional production cost analysis, will undervalue both renewable energy

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and energy storage resources. The synergies between portfolios of diverse renewable generation anticipated to exist in the region, in combination with the regional transmission systems and storage resources, should be studied in detail to assess how the PNW system is dispatched and operated differently with and without storage.

KPUD is also concerned that the WUTC may be prematurely "battery-centric" in their current approach. There are a number of technically feasible storage technology solutions that could ultimately be employed on differing time lines, in a range of capacity sizes and configurations to fill different needs of an integrated system. It is premature to focus exclusively on batteries at this point of the analytical work, as differing technologies can provide differing system benefits. We believe that pumped storage hydro should not be ignored in this effort given the magnitude of variable generation required in the West under the states' various portfolio standards and potential 111D scenarios, and the particular attributes pumped storage can provide.

Both the Argonne and Pacific Northwest National Laboratories have recently begun to do analytical work in the areas identified by the WUTC as it applies to pumped storage hydro in California and the Southwest. Vladimir Koritarov from Argonne, in conjunction with Energy Exemplar, NREL, MWH Global, Siemens and the USDOE recently produced a paper entitled "Modeling and Simulation of Advanced Pumped-Storage Hydropower Technologies and their Contributions to the Power System." The effort focused on advanced technology modeling and detailed production costs and revenue simulations at operational time parameters down to the frequency regulation level. KPUD suggests that WUTC consider this work. We would also suggest staff contact staff at PNNL in this regard as well. KPUD and PNNL discussed a PNNL effort to somewhat replicate the Argonne led effort but with a PNW perspective. PNNL has given the matter some thought which we believe they may be willing to share.

Klickitat PUD supports the Commission moving forward with developing procedures and tools for investor-owned utilities to reflect the value of energy storage in their planning and procurement processes. The staff's white paper identified several important elements to consider in order to accurately value energy storage. We encourage continuing this effort, incorporating the full range of storage technologies and the utilization of sufficiently sophisticated analytical tools to capture the full value of storage to Washington State and the Pacific Northwest system.

We appreciate the opportunity to comment.

Sincerely,

Jim Smith, PE
General Manager