DOCKET NO. UM 1910
EXHIBIT: ODOE/100
WITNESS: ROBERT DELMAR

Before the
PUBLIC UTILITY COMMISSION OF OREGON

OREGON DEPARTMENT OF ENERGY

Opening Testimony of Robert DelMar

March 16, 2018

Q. PLEASE STATE YOUR NAME AND ORGANIZATION.

A. My name is Rob Del Mar. I am a Senior Policy Analyst for the Planning and Innovation Division within the Oregon Department of Energy ("ODOE"), working out of the field office in Bend, Oregon with particular expertise in solar energy. I am testifying on behalf of ODOE.

Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS.

A. I have a degree in Architectural Engineering from Drexel University and have worked in the solar energy industry for 18 years. I started my career in the private sector as a design engineer and project manager at an engineering firm in New England responsible for the design, construction and monitoring of commercial and residential solar thermal and photovoltaic ("PV") energy systems. I worked at ODOE from 2007 to 2011 as an operations analyst and policy analyst, and at Energy Trust of Oregon from 2011 to 2013 as a senior project manager in the solar program. In 2013 I returned to ODOE, working as a senior policy analyst responsible for technical and policy support for solar technologies.

Q. PLEASE PROVIDE YOUR TESTIMONY.

A**. Introduction**

ODOE's testimony is divided into comments addressed to all three utilities – with recommendations for future improvements to resource value of solar ("RVOS") calculations and suggestions for future investigations by the stakeholders concerned with the RVOS process – and comments specifically addressed to

Pacific Power ("PacifiCorp"). The general comments are offered in ODOE's testimony in each of the proceedings for UM 1910, UM 1911, and UM 1912, while the utility-specific comments are included only in the respective proceeding.

General Comments on RVOS Calculations

ODOE would like to acknowledge the hard work completed by Portland General Electric ("PGE"), Pacificorp, and Idaho Power in developing the initial RVOS calculations. It is clear in their UM 1910, 1911, and 1912 filings that considerable effort was made to develop the RVOS values and the accompanying testimony. ODOE is committed to seeing accurate and comprehensive RVOS values that undergo regular analysis and revision as described in UM 1716 and by the individual utility filings. The process of analysis and revision will ensure the RVOS maintains accuracy under future market scenarios including higher solar saturation, which may impact hourly pricing scenarios, as well as technology developments that may minimize integration challenges and increase the value of solar on the grid. In the absence of an ancillary services market, the RVOS may also provide market signals that promote the development of solar projects that use innovative technologies to support grid operations.

Integration Costs and Grid Service Value

ODOE looks forward to participating in future efforts to quantify the grid services element of the RVOS. ODOE staff is engaged in a number of activities that may support this effort, including interactions with utility and community partners regarding resiliency planning and development of technical workshops regarding battery storage systems. For example, ODOE is a co-sponsor of a resiliency demonstration pilot at Eugene Water & Electric Board ("EWEB") that will deploy solar PV and battery storage to provide multiple benefits to EWEB customers and grid services for the utility.

In the Public Utility Commission of Oregon's ("PUC") order 17-357, an invitation is extended to Renewable Northwest or other parties to develop a proposal for valuing smart inverters. ODOE would like to offer support to the PUC and other RVOS partners in exploring grid service values and recommends that the discussion also include storage systems and other potential technology advances. Below are a few examples of how advanced technologies may impact RVOS values:

Smart Inverters: Modify start-up and drop-off characteristics of PV facilities. May impact integration charges. Opportunities also exist to operate the inverters to provide reactive power, including during periods without any solar production.

Storage systems: Storage systems may modify the production profile of PV facilities, which would impact energy, capacity, and deferred transmission and distribution ("T&D") maintenance values. Storage systems may also be operated to provide additional ancillary and load arbitrage services to the grid.

Solar Trackers: Tracking systems modify the production profile of PV facilities, which would impact energy, capacity, and deferred T&D maintenance values.

One outcome of this investigation should be to determine how the benefits of advanced technologies are distributed within the RVOS. One possibility would be to identify the additional value advanced technologies bring to each discreet element within the RVOS. Another option would be to group all of the benefits into a bonus value, which may or may not be the grid services element already identified but currently set at zero. There may be value in identifying a market-based bonus associated with advanced technologies to help facilitate their adoption. There are, however, complications such as how location-specific benefits should be considered and what to do when advanced technologies become common practice. These complications should be considered but not necessarily resolved until future RVOS proceedings.

Advanced technologies may also impact the negative value of integration costs. The integration charges are developed through utility integrated resource plan ("IRP") processes using variable integration value assessments based on acknowledged integration studies. For the purposes of the RVOS, it may be helpful to evaluate the integration charge with the aim of identifying opportunities to reduce the cost through strategic technology adoption.

Capacity

In previous comments under UM 1716, ODOE stated that it may be beneficial to conduct a sensitivity analysis on certain elements to determine the impact of different modeling assumptions. The capacity values may be a good opportunity to conduct such an analysis. In the PacifiCorp filing under UM 1910, the avoided generation capacity rate goes from $12.20/MWh under the standard 2015 IRP methodology to $17.96 under the partial displacement differential revenue requirement ("PDDRR") methodology. This represents an increase in the capacity value of almost 50% and warrants further discussion regarding the cause of the discrepancy.

Also in UM 1910, PacifiCorp describes the methodology for developing a capacity contribution value using a west-side fixed tilt solar resource and a representative utility scale solar profile for Lakeview, Oregon. PacifiCorp also describes that a single capacity contribution value is unlikely to be a reasonable representation for all solar resources. This is especially true in Oregon given the dramatic variations in climate and the recent expansion in the use of single axis trackers for utility scale systems in central and eastern Oregon. In the past year, the Solar Development Incentive program administered by Business Oregon announced 148.5 MW of new solar capacity in the state. Of the 148.5MW of new capacity, 141.9MW (95%) will utilize single axis trackers. Given the prominence of single axis trackers and the likely disparity between capacity values for fixed tilt west-side resources and east-side tracking resources, an analysis should be completed to determine the difference to capacity RVOS values between the two scenarios.

Storage

PacifiCorp indicates in its UM 1910 errata to direct testimony filing[1] that the value of a flexible resource such as batteries is greater when it is available to cover variations from the system as a whole, rather than using it to manage variations from a single solar resource so as to avoid integration charges. ODOE agrees that this is a valuable distinction to consider. While storage resources may provide more value if they are dispatched against system requirements, rather than to smooth the output of a single solar resource, there is not currently a market signal for discrete grid services to support development of standalone storage resources. Conversely, there is a market signal, however small, to couple storage with solar in the form of reduced interconnection capacity charges associated with the facilities.

Community solar projects may also result in solar plus storage installations where the batteries may be operated to provide grid services and backup power in the event of an emergency. Solar developers are approaching small cities in PacifiCorp's territory, such as Cottage Grove and Coburg, with the aim of increasing the resiliency of the community in the event of a natural disaster. Given the likelihood of additional solar plus storage projects in Oregon, ODOE believes there is good reason to further evaluate the impact of these systems within the RVOS. Batteries coupled with solar projects may impact multiple elements within the RVOS, including hourly energy and capacity values, deferred T&D equipment

---

1 http://apps.puc.state.or.us/edockets/edocs.asp?FileType=HTB&FileName=um1910htb144141.pdf&DocketID=21118&numSequence=16

investments, integration costs, and grid services. Developing strategies to evaluate storage benefits within the RVOS complements the PUC staff report under UM 1857[2] recommending that PacifiCorp develop methodologies to co-optimize the benefits that storage systems can provide.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

[2] PUC UM 1857 Staff Report filed on 9/22/17
http://edocs.puc.state.or.us/efdocs/HAU/um1857hau172350.pdf