BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1911

In the Matter of	)	
	)	
IDAHO POWER COMPANY	)	OREGON DEPARTMENT OF ENERGY
	)	OPENING BRIEF
Idaho Power Company Resource	)	
Value of Solar	)	
	)	

General Comments

This brief addresses grid services values and the related discussion of solar-plus-storage. The Oregon Department of Energy ("ODOE") acknowledges that it is premature to quantify many of the potential benefits of advanced technologies in the current resource value of solar ("RVOS") calculations. These comments are therefore meant to inform future iterations of the RVOS. ODOE is committed to seeing accurate and comprehensive RVOS values that undergo regular analysis and revision as described in UM 1716.

Grid Services Values

In PUC order 17-357, the Public Utility Commission ("PUC") extended an invitation to Renewable Northwest or other parties to develop a proposal for valuing smart inverters. ODOE would like to take this opportunity 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. That discussion should include:

1. Smart Inverters: Smart inverters modify start-up and drop-off characteristics of PV facilities, and may impact integration charges. Opportunities also exist to operate

inverters so that they would provide reactive power including during periods without solar production.

2. Solar Trackers: Tracking systems modify the production profile of PV facilities which would impact energy, capacity and deferred T&D maintenance RVOS values. A sensitivity analysis to evaluate the impact of solar trackers could be accomplished with the existing RVOS model by imputing modified production curves.
3. Storage: Storage systems co-sited with solar projects impact several aspects of the RVOS and will be addressed in further detail below.

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 benefits into the grid services element which could be applied as a bonus for systems utilizing advanced technologies.

Advanced technologies may impact the negative values associated with integration costs. The integration charges are developed through utility 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 potential of different emerging technologies to reduce integration costs. This will in turn support strategic and cost effective technology adoption.

There may be value in identifying a market based bonus associated with advanced technologies to help facilitate their adoption. There are however complications to a bonus approach, such as how location specific benefits should be considered and what to do when advanced technologies become common practice. ODOE recognizes that quantifying all of the values associated with advanced technologies is not plausible in the current RVOS proceeding

but should be considered in future RVOS proceedings as sound data is available to inform the calculations.

Storage

There are several factors which justify consideration of storage systems within the resource value of solar. Storage systems modify the production profile of PV facilities which would impact hourly energy, capacity and deferred T&D maintenance values. This impact could be evaluated within the current RVOS model and may become more critical in future scenarios with higher solar adoption or expanded western energy markets which may result in negative trends in midday energy and capacity values. Storage systems may also be operated to provide additional ancillary services to the grid. In the absence of an ancillary services market the RVOS may provide market signals that promote the development of solar projects that use innovative technologies to support grid operations. Developing strategies to evaluate storage benefits within the RVOS also complements PUC staff comments under UM 1857 encouraging the development of methodologies to co-optimize the benefits that storage systems can provide.

Value Benefits of Solar plus Storage

Storage systems have demonstrated value in reducing integration challenges of solar energy facilities in other markets. There are also financial benefits of co-siting solar plus storage which will likely result in market driven solar plus storage systems in Oregon before standalone storage systems are financially viable. In other more mature markets solar plus storage projects are frequently being bid together. Examples include the Excel Energy bid in Colorado[1] announced in January of 2018, and the recent Nevada Energy bids[2] which included proposals

[1] https://www.greentechmedia.com/articles/read/record-low-solar-plus-storage-price-in-xcel-solicitation#gs.wH2VkwA

[2] https://www.utilitydive.com/news/nv-energy-23-cent-solar-contract-could-set-new-price-record/525610/

with capacity payments for capacity. Additional financial benefits of siting storage with solar include the following:

1. Reducing solar integration charges: These may include integration and utility imposed facility study costs charged on a capacity basis.
2. 30 percent federal Investment Tax Credit ("ITC"): Batteries qualify for the federal ITC so long as a minimum of 75 percent of their charging is from a solar facility.
3. Reduced Construction Costs: Coupling a battery storage system with a solar facility reduces the installed cost of storage when compared to standalone systems. The solar-coupled systems benefit from savings on labor and interconnection costs when piggybacked onto a larger solar project. In the Xcel bids in January, standalone storage systems had a median bid of $11,300 per megawatt-month. Less than six months later Nevada Energy bids for storage systems coupled with utility scale solar projects came in below $8,000 per megawatt-month. This significant reduction is attributed to the financial benefits of co-siting the storage facilities with larger solar facilities[3].
4. Reduced energy losses: Direct DC charging improves the efficiency of grid connected storage systems by eliminating half of the round trip efficiency losses.

Conclusion

To summarize, in addition to smart inverters, other advanced technologies coupled with solar facilities, including storage systems, could impact RVOS values such as hourly energy, capacity and deferred T&D maintenance values. These values could be calculated using the current RVOS models given revised inputs to describe modified solar facilities production profiles.

[3] https://www.greentechmedia.com/articles/read/nevada-beat-arizona-record-low-solar-ppa-price#gs.SbKc9eQ)

Oregon currently lacks the market forces to drive commercial development of standalone storage systems and this is likely to remain true for the foreseeable future. Coupling storage systems with solar facilities provides several important financial advantages and will likely drive early commercial development of storage systems in Oregon. As we strive to meet Oregon's ambitious renewable energy goals, and as prices for storage systems decline, it is important to accurately determine their value to better understand the best time to make energy storage investments.

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Respectfully submitted,

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