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Attn: Filing Center

RE: UM 1910 —PacifiCorp's Reply Brief

PacifiCorp d/b/a Pacific Power encloses for filing in the above-referenced docket its Reply Brief.

If you have questions about this filing, please contact Natasha Siores, Manager, Regulatory Affairs, at (503) 813-6583.

Sincerely,

Etta Lockey
Vice President, Regulation

Enclosure

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

UM 1910

In the Matter of
PACIFICORP, d/b/a PACIFIC POWER
Resource Value of Solar

PACIFICORP'S
REPLY BRIEF

I. INTRODUCTION

In this proceeding, the Public Utility Commission of Oregon (Commission) directed PacifiCorp, d/b/a Pacific Power, to develop a utility-specific implementation of the resource value of solar (RVOS) that best reflects solar's value on the company's system. PacifiCorp fully implemented the RVOS elements identified by the Commission, and continues to largely support the model developed by Energy and Environmental Economics, Inc. (E3).

While PacifiCorp agrees with Commission Staff and other parties¹ that the E3 model is a flexible and useful tool for valuing a variety of resources, PacifiCorp offers the following clarifications in response to concerns raised in opening briefing:

- First, PacifiCorp's use of actual energy imbalance market (EIM) data provides the most accurate alternative for establishing energy values if the company's comprehensive partial displacement differential revenue requirement (PDDRR) approach is not adopted. Applying another utility's modeling, as Staff proposes, would be inappropriate, unnecessary, and burdensome.
- Second, PacifiCorp properly relied on specific T&D investment plans to develop a system-wide average value. Relying on an outdated marginal cost of service study would sharply overstate solar's ability to defer T&D expenditures, many of which are unavoidable.

¹ The Oregon Citizens' Utility Board (CUB), Renewable Northwest (RNW), the Oregon Solar Energy Industries Association (OSEIA), and the Oregon Department of Energy (ODOE) (collectively, Intervenors).

- Third, a hedge value of zero avoids double-counting solar’s hedging benefits, which are already incorporated into the energy element’s use of forward market prices.
- Fourth, PacifiCorp has provided ample analysis of possible environmental compliance costs in response to Staff’s prior suggestions.
- Fifth, PacifiCorp continues to support further investigation of how new technology can enhance solar’s ability to provide grid services. Any analysis must account for the ability to effectively dispatch resources to meet system needs.
- Sixth, PacifiCorp supports annual RVOS updates with new inputs derived from a single, consistent source. The most up-to-date, applicable information would be from the company’s most recently filed IRP.

II. DISCUSSION

PacifiCorp’s implementation of the RVOS fully complies with the Commission’s direction to provide *utility-specific* values for each RVOS element. Where certain RVOS elements are not addressed below, PacifiCorp believes that it fully responded to parties’ concerns in its opening brief.

A. Energy

PacifiCorp used the most accurate available information from both the company’s Official Forward Price Curve (OFPC) and hourly EIM data to create a 12 x 24 price shape for energy values. Staff continues to argue that EIM data provided “the sole source of information” for the company’s 12 x 24 price shape.² This is incorrect because, as explained in both PacifiCorp’s reply testimony³ and in PacifiCorp’s Opening Brief,⁴ the monthly shape for energy prices reflects the company’s OFPC, which was then further adjusted using hourly EIM data.⁵

² Staff’s Opening Brief at 6.

³ PAC/300, MacNeil/14.

⁴ PacifiCorp’s Opening Brief at 5.

⁵ PAC/100, MacNeil/6-7.

Staff suggests that, rather than use hourly EIM data, PacifiCorp instead use a modified version of the AURORA dispatch model, as Portland General Electric Company (PGE) proposes, to avoid relying on “historical transactions of multiple utilities.”⁶ PacifiCorp previously suggested an approach using its Generation and Regulation Initiative Decision Tools (GRID) model as part of the PDDRR methodology.⁷ Staff did not support PacifiCorp’s approach on the premise that “it is not timely to consider a different methodology that varies from the still-evolving RVOS Methodology.”⁸ While the company believes that a comprehensive PDDRR approach using GRID provides the most accurate comprehensive means of valuing solar, PacifiCorp continues to offer non-PDDRR values for each element in the alternative. But if a modeled approach is used, as Staff now suggests, the GRID model would be the appropriate tool for setting RVOS energy values for PacifiCorp because the company uses GRID, not AURORA, in its rate filings.⁹

Modifying a version of the AURORA model with the necessary inputs and assumptions to accurately reflect a market price would be both administratively difficult and not demonstrably more accurate. The AURORA model’s market prices are based on all participants’ dynamic resources and requirements, meaning that the model would need to be continually updated and adjusted to ensure that the model accurately reflects anticipated energy prices. Even with this time-intensive maintenance, all models are simplified representations of reality, and there is no evidence that a modified version of the AURORA model would yield a more accurate

⁶ Staff’s Opening Brief at 6.

⁷ PAC/100, MacNeil 51.

⁸ Staff/300, Andrus/23.

⁹ *See, e.g., In the Matter of PacifiCorp 2018 Transition Adjustment Mechanism*, Docket No. UE 323, Order No. 17-444 at 2 (Nov. 1, 2017) (“PacifiCorp uses GRID, its production cost model that simulates the dispatch of the company’s power system on an hourly basis.”).

price shape. By contrast, the EIM data PacifiCorp proposes to use already reflects actual hourly price shifts for a market in which the company actively participates, and thus reasonably predicts future hourly price shapes.¹⁰ Staff does not explain why the AURORA model would more accurately reflect the hourly price shape for solar than actual hourly EIM data¹¹

Aside from the means of establishing an accurate hourly price shape, PacifiCorp, Staff and Intervenors agree on the company's implementation of the energy value element.¹² For instance, regardless of the hourly shape, the *average* hourly price remains tied to the OFPC,¹³ and PacifiCorp agrees with Staff that the benefits of modeling variations on hydro conditions are outweighed by the administrative burden.¹⁴

B. Transmission and Distribution (T&D) Capacity

PacifiCorp developed a system-wide average T&D deferral value based on the projected costs of forecasted T&D capacity additions.¹⁵ The company then applied a T&D capacity contribution calculated by assessing the proportion of the forecasted T&D capacity additions that would be deferrable by solar. The capacity contribution value recognizes that one megawatt of solar resource may not defer one megawatt of T&D capacity. The T&D costs and capacity

¹⁰ PAC/300, MacNeil/23 (Figure 3, showing PacifiCorp's annual market position). In the alternative, an additional option for modeling short-term market prices was recently applied in PacifiCorp's Integrated Resource Plan (IRP) Update. *In the Matter of PacifiCorp's 2017 Integrated Resource Plan*, Docket No. LC 67, PacifiCorp's 2017 Integrated Resource Plan (IRP) Update (May 1, 2018). In that case, the PacifiCorp established hourly price curves to reflect one year of day-ahead hourly market price data available from the California Independent System Operator (CAISO). *Id.* at 54. These hourly price scalars are supported by a large volume of market transactions and are even more closely aligned with PacifiCorp's operational experience.

¹¹ Staff's Opening Brief at 6 (stating that a dispatch model "is better suited to measuring the value of solar to PacifiCorp's system than a shape based on historical transactions of multiple utilities in the EIM").

¹² Staff's Opening Brief at 3-6; CUB's Opening Brief at 1-2; RNW's Opening Brief at 4-5.

¹³ PAC/100, MacNeil/12.

¹⁴ Staff's Opening Brief at 6-7; *see also* Pub. Util. Comm'n of Or., June 25, 2018 public meeting, Hearing Transcript at 62 (responding to Chair Decker's question asking whether hydro modeling "is perhaps not worth the added administrative effort," Ms. Andrus stated, "We agree with PacifiCorp on that. . . . [T]here are other places that would provide more enhanced value for RVOS.").

¹⁵ PAC/200, Putnam/2.

contribution are applied to resources throughout PacifiCorp's Oregon service territory, including areas with no forecasted T&D investment need, so these values represent a "system-wide average."¹⁶ PacifiCorp will continue to refine this value with additional data, as extrapolating from areas of known need to areas with no planned T&D investments unavoidably overstates the total T&D investments that could be deferred, particularly in the near term.¹⁷ Of the options proposed, however, PacifiCorp believes this approach produces the most reasonable system-wide average T&D deferral value because it specifically measures solar's ability to avoid or defer expected T&D costs in Oregon.

Staff objects to the use of specific forecasted capacity additions, and proposes that utilities use a marginal cost of service study (MCOSS) to establish a system-wide average instead.¹⁸ While Staff acknowledges that PacifiCorp's approach is more granular, Staff argues that a MCOSS is necessary to achieve a "system-wide" value.¹⁹ Specifically, Staff urges PacifiCorp to use PGE's approach by "estimat[ing] the amount of transmission service that could be avoided due to solar generation" and then valuing this avoided transmission service using Bonneville Power Administration's (BPA) transmission rates.²⁰

There are several reasons why PacifiCorp opposes Staff's MCOSS proposal. First, Staff has not created a record in this case to address PGE's proposed transmission deferral

¹⁶ PAC/200, Putnam/2.

¹⁷ PAC/400, Putnam/5-6 ("Additional work is necessary because the distribution capacity contribution the company used was based on the analysis of 13 substations that demonstrated a capacity need but does not factor in the remaining 258 substation transformers that do not have a capacity need, which, if factored in, would reduce the value.").

¹⁸ Staff's Opening Brief at 11.

¹⁹ Staff's Opening Brief at 12.

²⁰ Staff's Opening Brief at 11.

methodology, nor does Staff address the applicability of this approach to PacifiCorp's system.²¹ It would be inappropriate for the Commission to consider Staff's proposal to adopt PGE's approach for PacifiCorp given the available record.

Second, PacifiCorp's MCOSS does not provide an accurate basis for determining a system-wide average for T&D deferrals. The MCOSS includes all T&D investments, regardless of whether those investments are deferrable by solar.²² PacifiCorp will be obligated to undertake substantial T&D investments for reliability reasons that will only incidentally increase T&D capacity.²³ Given that solar cannot avoid such costs, the MCOSS would substantially overstate solar's T&D capacity deferral value.

Third, PacifiCorp's deferrable transmission investments are not appropriately valued by BPA's transmission rates. For PGE, reliance on BPA's transmission rates may be reasonable given that utility's concentrated service territory. With a dense service territory, PGE may reasonably conclude that any new resources will be off-system and will require third party transmission service. BPA's third-party transmission rates would thus be relevant to determine the value of avoided transmission costs for PGE, as increased distributed solar would avoid the cost of transporting new resources from off-system projects. In contrast, PacifiCorp has a larger, more geographically diverse, transmission system and anticipates that resources deferred by solar would be on-system, for which third party transmission is unnecessary. Third-party transmission rates are thus irrelevant to determining the value of transmission costs avoidable by solar.

²¹ Staff's Opening Brief at 11-12; *see also* PGE/400, Murtaugh/8 (describing PGE's T&D approach and suggesting using a different system-average approach in the future, using either a consultant study or a modification of PGE's Strategic Asset Management (SAM) calculation).

²² PAC/400, Putnam 4 (“[A] correlation between capital additions and increases in load does not necessarily mean there is causality.”).

²³ PAC/400, Putnam/4 (“For example, the company is required to relocate distribution lines to accommodate a road that is widened, which results in distribution investment, but is not tied to a capacity or load increase.”).

Instead, PacifiCorp considered the projected costs of deferrable T&D capacity additions, divided by the capacity added.²⁴ This yields a more accurate and utility-specific T&D value for PacifiCorp's RVOS.

Fourth, Staff appears to have confused T&D deferral value and the distribution capacity contribution. Staff states that "PacifiCorp obtained the average value of deferred T&D investment based on three specific forecasted capacity additions (T&D projects) that PacifiCorp believes are subject to deferral by solar penetration in its Oregon territory."²⁵ This characterization inaccurately co-mingles the company's T&D deferral value and the distribution capacity contribution value, which were discretely assessed. The company calculated the T&D deferral value based on forecasted capacity additions and projected costs, as described above.²⁶ The company determined the distribution capacity contribution value by evaluating 13 Oregon substation capacity projects, of which solar could viably defer one project. In that analysis, solar was able to defer 3 MW of expected substation capacity upgrade needs beginning in 2023 out of 50 MW of total need over the subsequent 10 years.²⁷ Again, the company used this analysis to determine solar's distribution capacity contribution value, and then applied it to the Oregon T&D deferral value to create a solar-specific, system-wide average of T&D deferral for Oregon.

Separately, CUB appears to confuse the scope of PacifiCorp's T&D deferral values, stating that PacifiCorp should value T&D deferrals "across its entire Oregon service territory."²⁸ As the company explained in its direct testimony, PacifiCorp properly used a system-wide analysis for transmission deferrals and Oregon-wide analysis for distribution capacity deferrals.²⁹

²⁴ PAC/400, Putnam/3.

²⁵ Staff's Opening Brief at 11.

²⁶ PAC/200, Putnam/2.

²⁷ PAC/200, Putnam/4.

²⁸ CUB's Opening Brief at 7.

²⁹ PAC/200, Putnam/2.

For these reasons, the company requests that the Commission approve PacifiCorp's implementation of a system-wide average T&D deferral value extrapolated from actual deferrable T&D upgrades. It is inappropriate to adopt a uniform approach for identifying and valuing different utilities' T&D deferrals, as Staff proposes, when those utilities are not similarly situated.

C. Hedge Value

While PacifiCorp used the five percent proxy hedge value as directed by the Commission, the company continues to urge that the separate hedging value be omitted from PacifiCorp's RVOS to avoid double-counting solar's benefits.³⁰ The energy element of the RVOS already reflects forward electricity market prices, which includes a hedging value.³¹

Staff agrees that "a more utility-specific value would be preferable to a proxy," but sees "no reasonable alternative" to the five percent value.³² Staff does not address PacifiCorp's comments that the separate hedge element double-counts solar's hedging benefits, nor does Staff otherwise address the fact that the energy element already reflects a hedge value.³³ A reasonable alternative to the five percent proxy would be to omit this separate hedging element with the understanding that solar's hedging value is already incorporated into the energy element.

D. Environmental Compliance

Avoided environmental compliance costs are not a reasonable element of the RVOS at this time because PacifiCorp does not currently face any environmental compliance costs that could be avoided by increased solar penetration.³⁴ Nonetheless, PacifiCorp complied with the

³⁰ PAC/100, MacNeil/35.

³¹ PAC/100, MacNeil/35.

³² Staff's Opening Brief at 19-20.

³³ Staff's Opening Brief at 20.

³⁴ See PacifiCorp's Opening Brief at 26-27.

Commission’s direction to develop a placeholder value using environmental compliance scenarios from the company’s 2017 IRP,³⁵ which included constraints related to the Environmental Protection Agency’s Clean Power Plan (CPP).³⁶ At Staff’s request, PacifiCorp provided additional analysis of avoided environmental compliance costs using CO₂ prices, based on different sensitivity studies in the 2017 IRP.³⁷

In its opening brief, Staff objects that PacifiCorp based its environmental compliance value on the “cost to comply with the [CPP],” and argues that PacifiCorp’s analysis “should be replaced by carbon compliance costs used in the 2017 IRP.”³⁸ Staff believes that unspecified “emerging events regarding carbon regulations in Oregon” make this approach preferable.³⁹ As noted above, the company has already fully complied with Staff’s request by modeling the avoided compliance costs using CO₂ price scenarios from the company’s 2017 IRP.⁴⁰ Therefore, Staff’s objection is moot.

Staff also objects to PacifiCorp’s conclusion that there are no environmental compliance costs associated with market purchases during the company’s sufficiency period.⁴¹ Without explanation, Staff states that market purchases “hold a risk of compliance costs.”⁴² Given that market transactions are not associated with specific carbon values, it is unclear why Staff believes that market transactions would include environmental compliance costs.

³⁵ Order No. 17-357 at 23; PAC/100, MacNeil/36.

³⁶ PAC/100, MacNeil/36.

³⁷ Staff/200, Andrus/15; PAC/300, MacNeil/39.

³⁸ Staff’s Opening Brief at 21-22.

³⁹ Staff’s Opening Brief at 22.

⁴⁰ PAC/300, MacNeil/41; *see also* PacifiCorp’s Opening Brief at 25 (“PacifiCorp has since updated its RVOS model to incorporate Staff’s CO₂ pricing recommendations as possible future compliance scenarios.”).

⁴¹ Staff’s Opening Brief at 21.

⁴² Staff’s Opening Brief at 21.

E. Grid Services

PacifiCorp supports ODOE’s suggestion for ongoing analysis of storage systems’ possible grid services benefits, including the potential for additional benefits from combined solar and storage and smart inverters.⁴³ The flexibility of the RVOS makes it a valuable tool for assessing the benefits of a variety of resource profiles, including storage and solar/storage combinations. To accurately evaluate these resources’ grid benefits, any assessment must account for the resources’ ability to be reliably dispatched to meet system needs. While the possible benefits of smart inverters would also benefit from further inquiry, a full understanding of how to use and coordinate these technologies will be necessary before they can be effectively valued.

F. Updating the RVOS

PacifiCorp agrees with Staff and CUB that RVOS updates should be coordinated with annual avoided cost updates.⁴⁴ Staff argues that utilities should be required to use “the most recently available forward price curve” in future RVOS filings, regardless of the inputs used in each utility’s most recently acknowledged IRP.⁴⁵ While PacifiCorp supports using more up-to-date information by relying on the company’s most recently filed (rather than recently acknowledged) IRP, the company does not support updating different inputs from different sources. Regardless of the source, PacifiCorp urges the Commission to adopt a consistent source for RVOS inputs, rather than updating some values from non-IRP sources but not others. Annual updates will ensure that the most recent data, such as OFPC values, are being used, while streamlining the Commission’s review.

⁴³ ODOE’s Opening Brief at 1-2.

⁴⁴ Staff’s Opening Brief at 24; CUB’s Opening Brief at 8.

⁴⁵ Staff’s Opening Brief at 4.

III. CONCLUSION

PacifiCorp fully complied with the Commission's direction to develop utility-specific inputs to each of the RVOS elements, according to the methodology established by E3. PacifiCorp's analysis properly incorporated actual EIM data to develop the most accurate 12 x 24 price shape, relied on detailed T&D analysis to create a robust system-wide average value for deferrable investments, avoided double-counting solar's hedging benefits, and accurately reflected PacifiCorp's current lack of avoidable environmental compliance costs. Moving forward, PacifiCorp supports additional inquiry into combined solar/storage and other grid-support services, and joins Staff and Intervenors in suggesting annual RVOS updates. PacifiCorp looks forward to receiving further guidance from the Commission in its implementation of the RVOS.

Respectfully submitted this 9th day of August, 2018.



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