PACIFIC POWER
A DIVISION OF PACIFICORP

825 NE Multnomah, Suite 2000
Portland, Oregon 97232

July 20, 2015

VIA ELECTRONIC FILING

Public Utility Commission of Oregon
201 High Street SE, Suite 100
Salem, OR 97301-1166

Attn: Filing Center

Re: Docket UM 1716—PacifiCorp's Comments on Elements for Consideration in the Resource Value of Solar

PacifiCorp d/b/a Pacific Power (PacifiCorp or Company) appreciates the opportunity to provide comments regarding the elements for consideration in the resource value of solar.

I. Background

Opened in February 2015, this docket represents the culmination of several previous dockets and legislative directives that began in 2009 with a legislative directive to establish the Volumetric Incentive Rate Pilot Program.[1] Most recently, and also at the directive of the legislature,[2] in 2014 the Public Utility Commission of Oregon (Commission) provided its report "Investigation into the Effectiveness of Solar Programs in Oregon" to the legislature. As part of that report, the Commission committed to opening "a formal proceeding to determine the resource value of solar and the extent of cost-shifting, if any, from net metering."[3] Phase I of this proceeding, currently ongoing, is intended to determine the methodology for determining the resource value of solar, beginning with identifying the elements appropriately considered within that methodology. These comments are limited to Phase I, "Resource Value of Solar," of this proceeding, and PacifiCorp looks forward to discussing Phase 2, "Utility Fixed Cost Recovery," and Phase 3 "Reliability Impacts of Solar," in later comments throughout this process.

II. General Considerations

During the scoping workshops, parties discussed overarching concepts for consideration in determining the resource value of solar. Some of these concepts started as elements but were reclassified because it was agreed that they are inherent in analyzing the elements. Staff circulated a spreadsheet of overarching concepts for consideration in determining the resource value of solar, which were included as Table 3 to the Staff Memo.[4]

---

[1] See House Bill 3039.
[2] See House Bill 2893
[3] See report at page iv.
[4] The concepts are Type of Technology, Solar PV Scale, Levelization Period, Perspectives: Utility, Perspective: Customer, Perspectives: Non-Participating Customer, Perspectives: Society, Duration and Frequency of Reassessment of Values and Methodology.

PacifiCorp agrees that many of these concepts are important to consider in developing the resource value of solar. However, PacifiCorp wishes to clarify that these concepts are inherent in analyzing the various elements of the methodology for determining the resource value of solar and should not be framed as individual elements for inclusion in the methodology. PacifiCorp agrees with consideration of all the concepts that have been identified by Staff and the parties with the exception of Concept 8 "Duration and Frequency of Reassessment of Values and Methodology" which is discussed below. Concept 8 is most appropriately considered in the context of specific applications of the methodology and the resultant values. The need for updates to a methodology or the resultant values will depend largely on how the value is being used and should be determined by the entity implementing the application. Generally, it remains unclear exactly how the methodology developed in this docket will be used in the future. The specific application of this methodology will drive which elements should be considered, which may change for each application.

III. Discussion of Elements

PacifiCorp commends Staff for clearly and concisely organizing the many elements put forth by parties for consideration as part of the methodology for determining the resource value of solar. Since the opening of this docket in February 2015, parties have recommended elements for consideration or exclusion, proposed definitions for the elements, and offered additional considerations for the elements, including recommendations on timing of consideration of a particular element or the appropriate use of an element for specific applications. To coordinate the response of parties through the workshop process, Staff created a spreadsheet containing all the proposed elements (the Elements Spreadsheet).

As an organizational tool, the spreadsheet is extremely helpful; however, the spreadsheet format limits the ability of parties to provide robust commentary on the elements. For each element contained on the latest version of the Elements Spreadsheet, circulated by Staff on July 2, 2015 as Table 2 in the Staff Summary of Scoping Workshops, PacifiCorp's response below identifies, where appropriate, PacifiCorp's proposed definition of the element, whether it should be included or excluded from the resource value of solar, and additional considerations specific to the element. For ease of reference, PacifiCorp lists the elements in the order presented on the Elements Spreadsheet.

1. Avoided Energy Impacts (Element 1)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as the cost of utility energy generation or purchases that can be avoided due to the addition of solar generation, net of incremental costs incurred. Proper valuation of avoided energy costs due to solar generation should be based on actual utility avoided costs considering operational characteristics of solar resources.

2. Avoided Capacity Additions (Element 2)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as fixed costs of deferred utility generation capacity that may be displaced, or partially displaced, by the addition of solar generation. Deferrable utility generation capacity should be consistent with planned major resource acquisitions identified in a utility's integrated resource plan (IRP). Evaluation of avoided capacity additions due to solar generation should consider all operational characteristics of solar resources, including capacity contribution, accounting for potential changes in capacity contribution as penetration levels increase over time. Capacity contribution values impact planned resource acquisitions in utilities' IRPs. Any assumed avoidance of capacity additions should be aligned with a resource life or contract term. For instance, if one executes a solar contract for a three year term, and a utility IRP shows a resource need 10 years out into the future, then the solar resource should not receive value for avoiding capacity additions.

3. Line Losses (Element 3)

PacifiCorp agrees with Staff's recommendation that this element be included in load-sited solar valuations but not in a generic value of solar calculation. In docket UM 1559, parties agreed to use average line losses in the calculation of the resource value of distributed solar. Solar installations require a system reference to stay coupled to the system. The system reference has an inherent no-load losses and load losses which currently is built into an energy supplied to customer model. The line loss model should be refined to evaluate the benefits of reducing transmission losses and distribution losses due to a reduction in system loading levels as a result of the distributed generation compared to the fixed no-load losses and line losses associated with the supplied distributed generation. A properly calculated line loss valuation for net-metering should reflect the value and cost of energy generated and the cost of energy delivered. A utility scale project should be evaluated at the time of requested interconnection to assess the cost of interconnection and value of generation coupled with the loss model of the system to be interconnected.

4. Avoided Transmission and Distribution (Element 4)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as solar generation capacity required to avoid infrastructure based on peak load and solar generation profiles. Transmission and distribution systems must be sized and available to provide service at all times that solar is not available and also sized to accommodate when solar is putting excess generation on the system. Distributed small projects located in or near load areas may support local load without transmission improvements, but utility scale projects are no different in this regard from other types of generation.

5. Compliance Values: reduced RPS compliance due to reduced utility sales (Element 5)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as the value, if any, of decreased RPS compliance costs resulting from increased distributed solar generation, including the value, if any, of using distributed solar resources towards compliance with the RPS, as compared to alternative RPS compliance options.[5]

6. Security: Reliability, Resiliency, and Disaster Recovery (Element 6)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as the reliability or resiliency benefit or cost to the integration of solar. Solar resources undermine both resiliency and reliability. Any interconnected source that injects power at a location different than traditional results in limitations to reliability improvement measures.

7. Utility: Integration Impacts (Element 7)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as the cost of incremental operating reserves required to manage the intra-hour variability and hour-to-hour uncertainty in energy generation from intermittent generating resources. PacifiCorp has not yet performed its own solar integration study due to lack of actual solar generation data and relatively low penetration levels of solar resources on PacifiCorp's system. Other studies have been performed demonstrating solar resources give rise to integration costs.

8. Utility: Interconnection Impacts (Element 8)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. The Oregon regulatory framework places limits on the interconnection costs paid by the distributed generation developer. As far as those costs can be quantified they should be reflected as a reduction in the value of solar to the utility and other ratepayers. All costs not paid by the distributed generation customer should be captured in determining the value. This element should be considered when conducting an energy valuation as a cost to be reconciled.

---

[5] PacifiCorp wishes to clarify that the Oregon Solar Capacity Standard is a stand-alone obligation on electric utilities to install certain level of solar capacity by 2020. *See* ORS 757.370. Projects used to comply with the Solar Capacity Standard may also be used to comply with the Renewable Portfolio Standard (RPS), but the Solar Capacity Standard is not a "subset" of the RPS, as implied by Staff's memo. In addition, the level of solar capacity a utility is required to installed is established by rule—PacifiCorp is required to own or contract to purchase output and capacity equivalent to 8.7 megawatts—and, absent a change in the rules, will not decrease as the result of a decrease in the Company's levels of retail load. Although both the RPS and the Solar Capacity Standard encourage the development of renewable resources, each program is unique and relies on different showings for compliance (RECs for the RPS and owned or installed capacity for the Solar Capacity Standard).

9. Financial: Market Price Response (Element 9)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as the impact on market prices associated with increased solar resource penetration. Any incremental source of generation needs to take into account the impact on market prices. As more distributed or utility scale solar is added to the system, it will have an effect on market prices throughout the daylight hours. Primary solar production occurs during the "shoulder hours" of load peaks meaning the majority of solar production occurs between the morning and evening peaks when energy prices are typically lower. The consequence of this is that it may create an over generation scenario and drive market prices lower or into negative territory.

10. Utility: Administration Impacts (Element 10)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as the administrative costs associated with operating programs with non-standard billing, managing incentive programs, and evaluating and processing interconnection requests. To thoroughly understand the value of solar to the utility and non-participating customers, all costs not paid by the distributed generation customer should be captured in determining the value. This element should be considered when conducting an energy valuation as a cost to be reconciled.

11. Operational Impacts (Element 11)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as the operational costs, for example, the cost of operating reserves that would be incurred to get value from solar. Better behind the meter forecasting methods and tools are required to improve generation forecasts and the scheduling and dispatch of the energy to get the most value from solar.

12. Ancillary Services and Grid Support (Element 12)

PacifiCorp agrees with Staff's recommendation that this element be included in determining a resource value of solar. PacifiCorp defines this element as additional resources and regulation capacity that must be set aside to regulate variable generation. See, e.g., PacifiCorp's Open Access Transmission Tariff charges (Schedules 1, 2, 3, 5, and 6 for network resources). Additional resources are required to forecast solar generation (especially behind the meter solar which is difficult to forecast), and additional regulation capacity on conventional generators must be set aside to regulate for the variable generation. Often evening peak loads can coincide with a drop-off in solar generation, which can reduce the amount of capacity they offset and increase the amount of regulation capacity required.

13. Financial: Fuel Price Hedge (Element 13)

PacifiCorp disagrees with Staff's recommendation to include this element in the resource value of solar. This element should be excluded from determining a resource value of solar because it is already captured in Element 1 "Avoided Energy Impacts." PacifiCorp defines this element as the costs or benefits, if any, that solar generation avoids fuel costs, including avoidance of potential volatility in fuel costs related to fuel price changes. Fuel price hedging could reduce the volatility of the forecasted fuel costs, however, PacifiCorp generally hedges only limited portions of its fuel price exposure three years into the future, so any cost savings from alternative fuel price hedging would be limited. In addition, the uncertainty associated with solar generation may result in elevated fuel prices when output is less than expected, for instance on cloudy days. Such interactions would reduce fuel price hedge associated with solar generation and are unlikely to be accounted for in the Avoided Energy Cost determination.

14. Rate Impacts: Net Metering Credits (Element 14)

Whether or not this element should be included in determining a resource value of solar depends on the context in which the value is being used. PacifiCorp defines this element as the net cost borne by other customers due to the shifting of fixed costs. Fixed costs are shifted to other customers if the rate structure under which net metering customers are compensated reflects recovery of fixed costs in volumetric rates. The bills of non-participating customers are directly impacted by the bill credits and utility incentives that are given to net metering customers, and therefore represent a cost to other customers. This element should be considered as an element of cost for non-participating customers when considering value of solar in the context of net metering or the feed-in tariff.

15. Societal: Economic Development (Element 15)

PacifiCorp agrees with Staff's recommendation to exclude this element from the resource value of solar. PacifiCorp defines this element as the economic activity related to the installation of roof top solar. It is difficult to distinguish this solar related economic development in any meaningful way from any other infrastructure development. In addition, PacifiCorp agrees that this element is beyond the scope of this docket.

16. Avoided Natural Gas Pipeline Costs (Element 16)

PacifiCorp disagrees with Staff's recommendation to include this element in the determination of the resource value of solar. PacifiCorp defines this element as avoided cost of transporting natural gas fuel supply to a future natural-gas-fired generator owned by the utility. This element should be excluded because avoided natural gas pipeline costs are specific to individual future resource acquisitions. To the extent future resource acquisitions are utilized to determine avoided capacity additions, avoided pipeline costs will be considered as part of that element and does not require separate investigation.

17. Health and Other Societal Impacts (Element 17)

PacifiCorp agrees with Staff's recommendation to exclude this element from determining a resource value of solar because it is outside the scope of this docket. The report should focus on quantifiable costs and benefits that are incurred by the utility and its ratepayers. Studies have been conducted to attempt to estimate the heath and other societal impacts of different generating resources, but the results vary widely and typically the results have little consensus. As such their applicability in regulatory proceedings is limited, as there rarely is agreement on how to quantify any potential benefits.

18. Capital Risk (decreased risk of capital and cost due to system impacts of solar) (Element 18)

PacifiCorp agrees with Staff's recommendation to exclude this element from determining a resource value of solar because any avoided capital additions would already be captured in others elements (for example, elements 1, 2, and 4). To the extent this element refers to future interest rate volatility, PacifiCorp believes that measuring such impacts is too speculative to define within the context of this docket.

19. Utility: Production Impacts (IRP Process: levelized cost of production over the lifetime of the project based on a n assumed annual capacity factor ($/MWh)) (Element 19)

PacifiCorp agrees with Staff's recommendation to exclude this element from the resource value of solar. PacifiCorp defines this element as the IRP-based cost of production of a solar resource, accounting for all operating costs, up-front investment costs, and performance degradation over the resource life.

20. Behind-the-Meter Production During Billing Month (Element 20)

PacifiCorp agrees with Staff's recommendation to exclude this element from the resource value of solar. The value of this element is captured under avoided capacity additions and avoided energy impacts and as such does not need to be separately evaluated.

21. Resource Need (Element 21)

PacifiCorp agrees that this element should be included in determining a resource value of solar. The value of any generation resource should be predicated on the need for the utility to acquire the resource.

22. Rate Impacts: Lost Utility Revenue (Element 22)

PacifiCorp agrees that lost utility revenue is a valid issue that needs to be addressed in the context of this docket. In the long-run, lost utility revenue affects the rates paid by non-

participating customers. Because this element is already captured in Element 14 "Rate Impacts: Net Metering Credits," PacifiCorp agrees with Staff's recommendation to exclude this element.

23. Tax Credits (State and Federal) (Element 23)

PacifiCorp agrees with the Staff recommendation to exclude this element from the resource value of solar. PacifiCorp defines this element as the cost of federal and state tax credits. Tax credits have no impact on the value of solar energy to the utility or non-participating customers.

24. DSM Alternative Impacts (Element 24)

PacifiCorp is not clear what is intended by this element. However, based on Staff's memo, it appears this element is intended to capture the impact of decreased load from solar distributed generation on the public purpose charge. To the extent retail load decreases and utility revenues decrease, public purpose charge collections may also decrease. Examination of the impacts to the public purpose charge is beyond the scope of this proceeding and should not be included in the resource value of solar.

25. Environment: Compliance Impacts (Element 25)

PacifiCorp agrees with Staff recommendation to include current environmental compliance obligations in the resource value of solar. [6] To the extent that environmental compliance obligations are known and quantifiable, it is appropriate to reflect them in the resource value of solar. To the extent environmental compliance obligations are speculative, PacifiCorp agrees with Staff's recommendation to exclude those elements from the resource value of solar.

26. Environment: Externalities (Element 26)

PacifiCorp believes that this element, including the sub-elements identified in the Elements Spreadsheet[7], should be excluded from determining a resource value of solar since this element is outside the scope of this docket and is too speculative to define within the context of this docket. The report should focus on quantifiable costs and benefits that are incurred by the utility and its customers. Studies have been conducted to attempt to estimate the environmental externalities of different generating resources, but the results vary widely and typically the results have little consensus. As such their applicability in regulatory proceedings is limited, as there rarely is agreement on how to quantify any potential benefits. Furthermore, such

[6] The Elements Spreadsheet identifies the following sub-elements to element 25: Carbon—Current, Carbon—Future, NOx/Sox/Particulates—Current, NOx/Sox/Particulates—Future, Other—Current, and Other—Future. Staff recommends inclusion of Carbon—Current, NOx/Sox/Particulates—Current, and Other—Current.

[7] The Elements Spreadsheet identifies the following sub-elements: Carbon—Societal Impacts of Carbon, Carbon-Ocean Warming and Acidification, NOx/Sox/Particulates—Societal Impacts, Avoided water usage—For Thermal Power Production, Avoided water usage—For Natural Gas Hydraulic Fracturing, Avoided pollution—Associated with Hydraulic Fracturing.

externalities are not borne by the utility and its customers; it is therefore inappropriate to include as a cost that is avoided by the utility as a result of solar installation.

IV. Conclusion

Respectfully submitted this 20th day of July, 2015.

Etta Lockey
Senior Counsel
PacifiCorp
825 NE Multnomah Street, Suite 1800
Portland, OR 97232-2135
Phone: (503) 813-5701
etta.lockey@pacificorp.com