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Via Electronic Filing

Public Utility Commission of Oregon
Attention: Filing Center
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Re: UM 2011 – General Capacity Investigation

PGE appreciates the information provided by Staff and other parties in this docket. PGE notes that at this stage in the process it appears there is not "a common framework of understanding by parties and stakeholders of appropriate assumptions to value capacity", nor a common understanding of the term "capacity". PGE provides the following comments to clarify PGE's position and respond to the specific questions in Staff's Request from November 15, 2019.

PGE believes that the use of the term "capacity" in this docket specifically refers to the ability for a resource to contribute to meeting resource adequacy needs, also known as generation capacity, or bulk system capacity. PGE therefore believes that the appropriate interpretation of capacity value in the context of this docket is generation capacity value. While resources may have other attributes that meet explicit system needs or provide benefits to the system (such as providing energy, flexibility,[1] and/or locational value), the value associated with these other functions are outside the scope of this docket and will be appropriately addressed in other proceedings. For example, the Investigation into Distribution System Planning (Docket No. UM 2005) is the appropriate docket for investigating locational values associated with the distribution system.

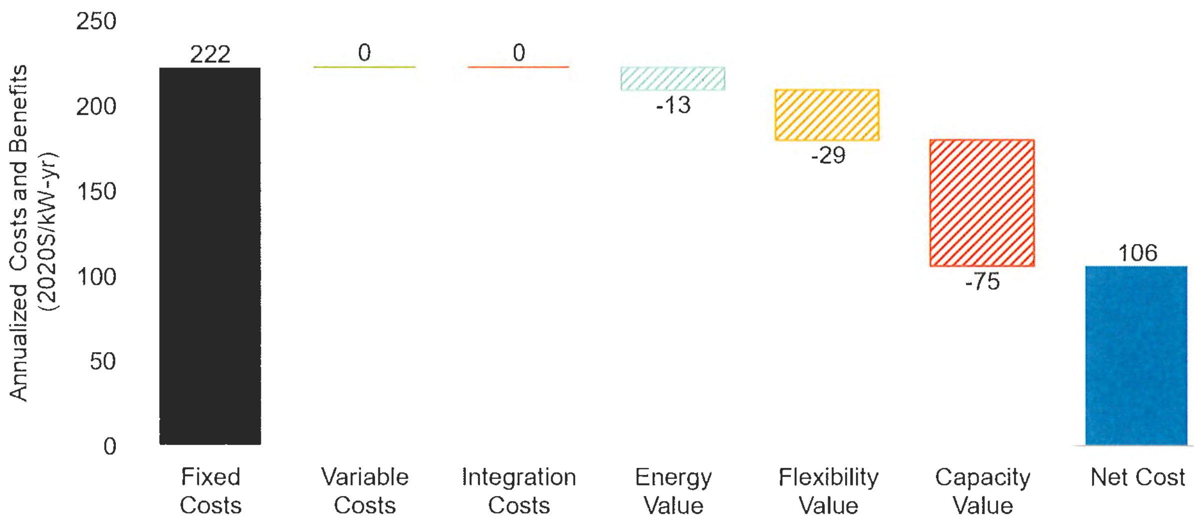
Capacity value represents the estimated dollar value of a resource's capacity contribution and is calculated based on a presumed cost of capacity multiplied by the resource's capacity contribution. In the absence of a competitive procurement process, capacity cost is estimated based on the net cost of new entry (net CONE) of a new long-term capacity resource based on

[1] For IRP planning flexibility value is a forecasted reduction to system variable operating costs due to flexible attributes of a resource. PGE notes that resources without utility dispatch control may provide little or no flexibility value. Additionally, some resources bring a net increase to system variable operating cost, which is reflected in an integration cost adder (e.g., wind and solar integration costs).

Integrated Resource Planning (IRP) methodologies. A resource's capacity contribution is also estimated based on IRP methodologies and represents the amount (MW) of an alternative resource that can be avoided by adding the resource in question while satisfying the generation capacity need. As described in Section 4.3 of PGE's 2019 IRP, PGE uses the RECAP model to assess system capacity need and the capacity contributions of resource options. RECAP is a probabilistic model that examines the coincidence of resource availability with resource needs to meet a reliability metric (for PGE, a 1-day-in-10-year loss of load expectation standard).

As PGE describes in the 2019 IRP, the capacity value of a resource is just one type of value that a resource may bring to the system. **Figure 1** shows the derivation of the net cost of a 6-hour battery from the 2019 IRP, which separately and distinctly accounts for energy value, flexibility value, and capacity value.

Figure 1. Figure 6-10 from PGE's 2019 IRP



The methodology that PGE employs to determine capacity contribution is consistent with the outcome of Docket No. UM 1719, an "Investigation to Explore Issues Related to a Renewable Generator's Contribution to Capacity." This contested case proceeding resulted in Order No. 16-326, which adopted a stipulation agreement regarding methodologies for estimating capacity contribution in IRPs. In that stipulation, parties agreed to a definition of effective load carrying capacity (ELCC) as, "the estimated additional load that can be added to a system, or the estimated benchmark resources (conventional or perfect) that can be avoided, due to the inclusion of a particular resource or group of resources with no net change in system reliability as measured by Loss-of-Load Probability or Loss-of-Load Expectation (LOLE)."[2] In Order No. 16-326, the Commission noted that utilities had been in agreement, "that they should

[2] OPUC Order No. 16-326, Appendix A at 2-3.

have flexibility in choosing the methodology that produces reasonable results for their particular system."[3]

In this docket, as in UM 1719, PGE continues to recommend that in order to provide reasonable and appropriate capacity contribution values, utilities should be able to employ the methodology suitable for their system. The needs and characteristics of systems differ and a method that is reasonable for one system may not be reasonable for another. PGE also continues to recommend that a capacity contribution methodology that is aligned with the methodology used to assess capacity need for long-term planning ensures consistency between resource evaluation and resource needs and leads to improved estimates.

This docket provides an opportunity to gather information to create a better understanding of capacity value issues. However, PGE is concerned that this type of general investigation is not the appropriate format for determining utility-specific methodologies. As in UM 1719, PGE believes that the determination of capacity value methodologies should be made through a contested-case proceeding because this will be a fact-specific inquiry for each utility.

Discussion among parties in the workshops have touched upon methodologies for assessing capacity value for avoided cost applications. PGE notes that the Commission has opened a proceeding to investigate the calculation of avoided costs for PURPA qualify facilities (QF) in UM 2000. PGE believes that issues associated with calculating avoided costs for QFs will be appropriately addressed in that investigation. PGE also notes that the procurement of resources through avoided cost methods does not provide customers with the benefit of competitive procurement processes. Competitive procurement may result in resource costs significantly below avoided cost prices. Pending the resolution of these larger issues in an avoided cost proceeding for QFs, PGE recommends that the capacity value in these applications continue to be aligned with IRP capacity contribution methodologies and capacity values.

As discussed above, PGE considers the appropriate scope of this docket to be the consideration of generation capacity (or bulk system capacity) value. In that context, PGE responds to the questions as follows.

A. <u>Which Resource Attributes are Appropriate to "Capacity"?</u>

1. Which of these capacity definitions are applicable for which types / categories of capacity, if at all?

   a. Nameplate capacity

   b. Maximum dependable capacity

[3] OPUC Order No. 16-326 at 5.

c. **Baseload capacity**
d. **Ability to meet energy needs**
e. **Effective Load-Carrying Capability (ELCC)**
f. **Peaking capacity**

Each term listed above relates to an attribute of a resource that may or may not influence that resource's capacity contribution to a system. The applicability of the attribute may vary by resource, system, and capacity contribution assessment methodology. Additional attributes may also impact a resource's capacity contribution. The information below is provided in the context of applicability to generation capacity value.

a. **Nameplate capacity** – The gross output capability of a generator as specified by the manufacturer under stated or "normal" operating conditions. The nameplate capacity is not a typical input to RECAP for assessing system capacity contribution.

b. **Maximum dependable capacity** – The maximum net output of a resource that can be depended on, typically for a specified length of time (e.g., one hour, four hours). PGE uses this attribute in modeling some hydro resources in RECAP.

c. **Baseload capacity** – Traditionally used to refer to a type of thermal resource that generated energy for a significant number of hours per year, typically had low variable operating costs, and often had longer start and minimum run times (e.g., combined-cycle combustion turbine, coal-fired generator, nuclear reactor), as opposed to peaking capacity (see part f below). This type of classification is not used in RECAP and the generalizations may no longer be as applicable as in the past.

d. **Ability to meet energy needs** – PGE is unclear what Staff intended by this term in this docket. In the context of the IRP, energy need is examined on an annual average basis and is an indicator of risk of exposure to market prices based on PGE's energy shortage to market. Unlike capacity need, energy need does not establish a minimum adequacy threshold that must be met in portfolio design.

   A resource must be capable of providing some amount of energy in order to contribute to meeting capacity needs and therefore, the capacity contribution of a resource is impacted by its ability to provide energy. For example, a resource that can provide 100 MW for two hours per day will likely have a lower capacity contribution value than a similar resource that can provide 100 MW for six hours per day.

e. **Effective Load-Carrying Capability (ELCC)** – As defined in UM 1719, the ELCC of a resource is "the estimated additional load that can be added to a system, or the estimated benchmark resources (conventional or perfect) that can be avoided, due to the inclusion of a particular resource or group of resources with no net change in system reliability as measured by Loss-of-Load Probability or Loss-of-Load Expectation (LOLE)."[4] ELCC is typically expressed as a percentage based on the net output (maximum or annual average) of the incremental resource. A resource's ELCC value is an output from a capacity contribution calculation. PGE reports ELCC values for resource options in the IRP based on analysis using the RECAP model.

f. **Peaking capacity** – Traditionally used to refer to a type of thermal resource that generated energy for a limited number of hours per year, typically had high variable operating costs, and often had short start and minimum run times (e.g., simple-cycle combustion turbines, duct burners, reciprocating engines). This type of classification is not used in RECAP.

Many other resource attributes, which are not listed above, are applicable to assessing capacity contribution. For example, in RECAP, the capacity contribution of a thermal resource is typically impacted by the following attributes: resource unit size, monthly capacity based on average temperature, forced outage rate, and forced outage distribution. Wind resources are typically characterized by hourly generation profiles that are based on either historical actuals or synthetic generation data calculated based on historical wind data. The type of information that is used to determine the capacity contribution depends on the particular characteristics of that resource and capabilities of the model being used. Section I.3 of PGE's 2019 IRP describes the RECAP model, including inputs for different resource types.

As discussed above and in UM 1719,[5] capacity contribution is a function of both a resource's attributes and a system's characteristics. A specific resource may have a different capacity contribution when evaluated for one utility's system than when evaluated for another utility's system.

2. To what extent should flexibility and/or ability for the utility to dispatch a given resource (or resource category) be considered? In other words, should it be treated as a distinct capability or type/category of capacity, or as an enhancement to that resource's capability / capacity offering?

When evaluating capacity value as defined in these comments, the ability of a utility to dispatch a resource may impact the capacity contribution and should be considered in analysis. A non-dispatchable resource may provide a contribution to meeting capacity needs, but the ability to dispatch the resource may increase the capacity contribution. To the extent that there are restrictions on how a resource may be dispatched, this is reflected in the resource characterization in RECAP. For example, the resource characterization for a dispatchable

[4] OPUC Order No. 16-326 at Appendix A, pg 2-3.
[5] UM 1719, PGE's Opening Testimony, Olson at 10.

customer storage resource is different than that of non-dispatchable customer storage resource in RECAP. The resource characterization for a dispatchable customer storage resource accounts for the ability of the utility to dispatch that resource during the hours of highest expected need. Whereas the resource characterization for a non-dispatchable customer storage resource reflects the charging and discharging behavior that the customer may choose based on their desired outcomes, for example, for a lower bill.

The dispatchability of a resource also affects the flexibility value provided by that resource, which is separate and distinct from the capacity value. While the capacity value reflects the potential savings associated with avoiding procurement of a resource to meet generation capacity needs, flexibility value reflects the potential to reduce system variable operating costs while meeting operational flexibility needs, like ramping and operating reserves. This is discussed in Section 6.2.2 of the 2019 IRP.

3. **Similarly, how should potential ancillary services offered by a resource or resource category be considered? Do they represent a distinct category of capacity? Or an enhancement to the available capacity offered by a given resource?**

The ability to provide ancillary services is an attribute of a resource and can affect the value of a resource to a system, but does not affect capacity value as defined in these comments. PGE captures the value of the ability to provide some ancillary services within the flexibility value (see Section 6.2.2 of the 2019 IRP).

PGE's capacity assessment includes the obligation to provide spinning and supplemental (non-spinning) contingency reserves. Resources do not need to be capable of providing contingency reserves to provide capacity. Resources that can provide non-spinning reserves but are not dispatched under normal operating conditions (for example, PGE's Dispatchable Standby Generation (DSG) units) can contribute to meeting the portion of system capacity needs associated with non-spinning reserve obligations. The resource characterization of DSG in RECAP reflects this limitation.[6]

4. **Are there distinct types of capacity that could be separately compensated, assuming that adequate information, communications and control systems are in place? For example, should capacity that has the following capabilities be considered distinctly:**
   a. **Available to meet system Resource Adequacy (RA) needs?**
   b. **Available to meet system flexibility needs?**
   c. **Available in a certain time frame?**
   d. **Available in a certain location?**

[6] See Appendix F of the 2019 IRP.

As detailed above, PGE specifically identifies capacity value as corresponding to a resource's ability to contribute to meeting generation capacity or bulk system capacity needs. Resources may have additional attributes or capabilities that can provide other benefits to the system and may bring additional value, but these value streams are distinct from capacity value. More specifically, in reference to the list above:

a. The term "resource adequacy (RA) needs" typically refers to the need to have adequate generation capacity to meet a planning reliability metric such as an LOLE standard or a planning reserve margin. In this context, capacity value is encompassing of the value associated with meeting RA needs.

b. Different resources bring different flexibility benefits and costs to a system. PGE captures flexibility value in a separate and distinct value stream from capacity value. Please see PGE's response to Question No. 02 in this response.

c. The time frame (e.g., hours or months of availability) in which a resource is available to provide capacity is an important resource attribute that is considered in determining capacity contribution. PGE considers this as part of the resource characterization in RECAP.

d. The location of a resource may impact a resource's capacity contribution in that it may impact resource attributes such as wind generation profiles or temperature dependent maximum dependable capacity. PGE considers these impacts as part of the resource characterization in RECAP. Some resources may also have locational value, which encompasses impacts on the transmission and distribution systems as a result of locating the resource at a specific location on the grid. Locational value is separate and distinct from capacity value and is out of scope for this docket.

PGE illustrates how capacity value, flexibility value, and locational value can be characterized distinctly, but considered together in evaluating the value of a resource in Chapter 6 of the 2019 IRP. See also Figure 1 in these comments.

5. **Utilities and stakeholders have already submitted a good deal of relevant information in the form of presentations and workshop participation. Staff appreciate these contributions and will continue to draw upon them, and interested parties do not need to file the same presentation materials again. However, are there other comments pertinent to the questions asked in Phases I and II (i.e. "What is Capacity," and "How do we value Capacity today?") that you would like to share with all parties, to clarify, deepen, or add nuance to your position or understanding of these issues?**

PGE would like to further respond to this question when answering part B of Staff's question list. As an initial matter, PGE would like to clarify and correct the characterization of PGE's positions in 'Staff's Observations from Phases I and II'.[7]

Staff's implication that "the only resources with capacity value are dedicated, reserve generation assets available to put energy onto the system at any given time"[8] is incorrect. Resources that are not dispatchable continue to provide capacity value by reducing the expected needs to acquire capacity resources while still achieving forecasted loss of load expectation standards. For this reason, PGE's planning process assigns capacity value to all resource types, including wind and solar, that are not able to provide energy at any given point in time.

Staff's suggestion that PGE does not credit 'financial and contractual resources' with capacity value is unclear. To clarify, physical supply-side and demand side resources do provide capacity value whether conveyed through contract or ownership. Financially settled transactions that do not include physical power delivery do not have capacity value. On a procurement basis, PGE does not credit capacity value to uncommitted purchases of physical power when those deliveries a) are not tied to a physical generating asset or portfolio; and b) can be voluntary excused through payment of financial damages.[9]

Thank you for your assistance. If you have any questions, please do not hesitate to call me.

Sincerely,

for Erin E. Apperson
Assistant General Counsel

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[7] See Staff's Request for Public Comment Nov 15 2019.
[8] Staff's Request for Public Comment Nov 15 2019, page 2 of 6.
[9] In the IRP, PGE does allow a limited quantity of market purchases to contribute to PGE's capacity assessment. The quantity of market purchases during summer and winter peak hours in the IRP is based on a study examining regional resource adequacy (see External Study E in PGE's 2019).