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V. Denise Saunders
Associate General Counsel

April 6, 2018

Via Electronic Filing

Oregon Public Utility Commission
Attention: Filing Center
PO Box 1088
Salem OR 97308-1088

Re: LC 66 – Portland General Electric Company’s 2016 Integrated Resource Plan (IRP)

Dear Filing Center:

Enclosed for filing in the above-referenced docket is Portland General Electric Company's ("PGE") Reply Comments.

Thank you for your assistance.

Sincerely,

A handwritten signature in blue ink that reads "V. Denise Saunders". The signature is written in a cursive style.

V. Denise Saunders
Associate General Counsel

VDS:bop

Enclosure

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

DOCKET NO. LC 66

In the Matter of

PORTLAND GENERAL ELECTRIC COMPANY,

2016 Integrated Resource Plan.

PORTLAND GENERAL ELECTRIC COMPANY's

Reply Comments

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1. Introduction

Portland General Electric Company (PGE) filed its 2016 IRP Update with the Public Utility Commission of Oregon (OPUC or Commission) on March 8, 2018. The Oregon Citizen’s Utility Board (CUB) and Commission Staff submitted comments on the Update.

CUB indicated its appreciation for PGE’s IRP Update and the changes made in PGE’s resource plan since the original IRP filing was made. It also applauded PGE for listening to stakeholders, being willing to take its resource portfolio in a new direction and successfully executing its strategy.

Staff identified a number of observations and concerns but stated that it “sees these observations and concerns being addressed by PGE, Staff and stakeholders over the next several months leading up to the release of the 2019 IRP.” No party submitted comments suggesting that the Commission should not acknowledge the Update. In these Reply Comments, PGE provides a focused response to specific questions raised by Staff. Specifically, PGE addresses the following:

- Energy Efficiency Forecast;
- Renewable Portfolio Standard (RPS) Need;
- Decarbonization Study;
- Distribution System Planning;
- Gas Forecasts and Wholesale Market Prices; and
- Avoided Costs.

PGE agrees with Staff that the issues they raise can be addressed during the 2019 IRP stakeholder process. None of the matters raised by Staff should impact the Commission’s ability to acknowledge PGE’s 2016 IRP Update. Commission acknowledgment of the Update is needed to permit the Company to include the updated supply side resource costs and operating parameters, financial parameters, carbon offset costs, and incremental wind and solar capacity contribution values in its May 1 avoided cost update filing. Updating these numbers will allow for greater accuracy in the calculation of avoided costs and will help protect PGE’s customers from high avoided cost prices due to the use of outdated information.

2. Energy Efficiency Forecast

The IRP Update incorporated the November 2017 energy efficiency (EE) forecast provided by the Energy Trust of Oregon (Energy Trust). Staff issued and PGE responded to five data requests for additional information regarding the forecast.¹ Regarding Staff’s two main areas of questions, PGE summarizes the following from the data responses:

1. **Total Resource Cost Increase.** Staff requested information regarding the increase in total resource cost between the forecasts provided in June 2015 and November 2017. PGE does not have full visibility into the data, calculations, or methodologies used by the Energy Trust in the two forecasts, but notes that there have been changes to the Energy Trust’s processes

¹ See PGE’s Responses to OPUC Data Requests No. 143-147.

and data since the June 2015 forecast. The November 2017 forecast also uses updated avoided cost information provided by PGE. For example:

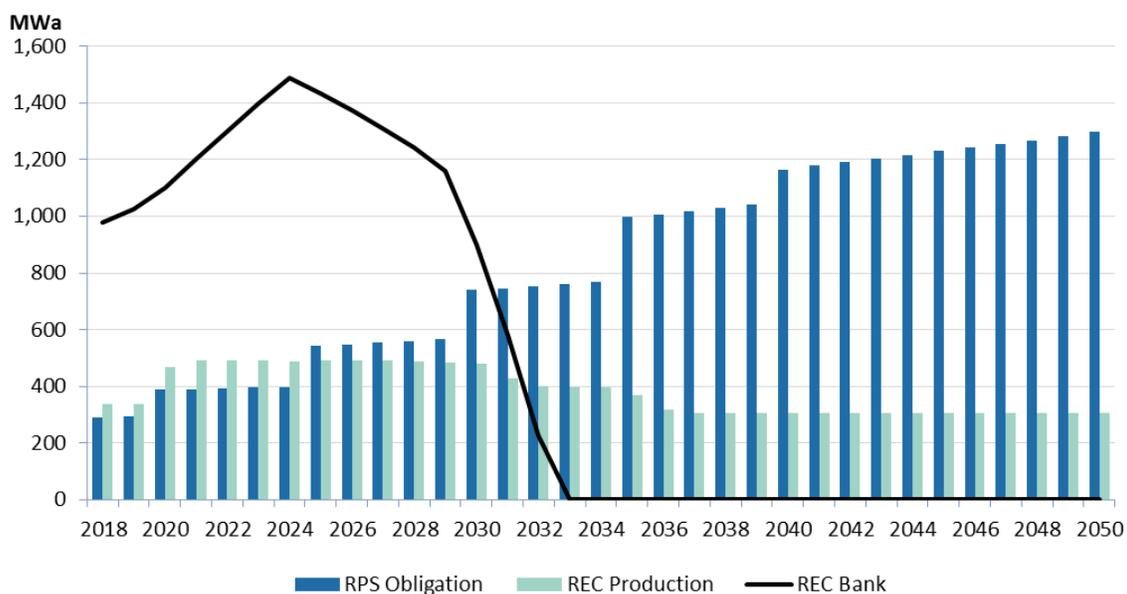
- The first year of the capacity deferral credit changed from 2020 to 2018.
 - The 10% conservation adder was applied to two additional elements.
 - The capacity deferral credit was updated to include an adjustment for line losses.
 - The treatment of emerging technology was updated.
2. **Partial EE Forecast.** Staff requested additional information regarding the forecasts for residential lighting transformation and the mega project adder and their inclusion in the IRP Update. PGE understands that the lighting transformation forecast estimates the impact of market trends outside of Energy Trust’s programs and that the mega project adder forecasts additional savings through 2037 based on the average of savings associated with unexpected large projects that occurred during the recent years of economic expansion. PGE incorporated these items as a sensitivity to the need assessments in the IRP Update. For simplicity, the sensitivity did not adjust load to account for any potential transformation embedded in the trending, nor to account for any additional load potentially associated with unexpected large projects.

3. RPS Need

With respect to PGE’s update to its RPS needs, Staff’s comments included requests for additional information related to three topics. These are discussed below.

1. **PGE’s use of banked RECs relative to generated RECs for RPS compliance.** PGE addressed Staff’s questions regarding this topic in its response to OPUC Data Request No. 149, in which it provided the following figure (Figure 1) showing an updated version of PGE’s projected REC bank graphic, using the data included in the IRP Update.

FIGURE 1: PGE’S PROJECTED REC BANK (2018-2050)



2. **PGE's sufficiency/deficiency period.** Staff requested an update to PGE's sufficiency/deficiency period. PGE currently expects the next adjustment to the Company's resource sufficiency period to occur at the conclusion of the upcoming Renewables Request for Proposals (RFP).
3. **Revised glide path analysis.** PGE believes that a detailed glide path analysis is out of scope for this IRP Update because the Company is not proposing changes to the actions acknowledged in the 2016 IRP. However, for informational purposes, the Company conducted a high level analysis of how the update to its load forecast impacts the incremental nature of its acknowledged RPS action. PGE's updated load forecast results in an incremental RPS need of 860 MWa in 2040, which is slightly lower than the long-term need identified in PGE's Revised Renewable Action filing (921 MWa). The 100 MWa RPS Action would represent 11.6% of this updated long-term need, an increase of less than 1% relative to the fraction identified in PGE's Revised Renewable Action filing.

4. Enabling Studies, Portfolio Ranking, and Scoring Metrics

PGE appreciates Staff's comments regarding enabling studies, portfolio ranking, and scoring metrics. The Company looks forward to working with Staff and stakeholders to address these and other questions in the 2019 IRP process and appreciates the engagement received to-date.

Regarding the **Decarbonization Study**, PGE will continue to work with Staff and stakeholders in the 2019 IRP public process to identify how the learnings from the study can help us understand the potential challenges and opportunities in achieving a 100% clean and renewable energy system.

5. Distribution System Planning

PGE appreciates Staff's positive comments in regard to distribution system planning (DSP), noting Staff's encouragement of the collaborative activities undertaken thus far. In the foundational series of meetings between PGE and Staff, PGE has made efforts to inform Staff on existing distribution planning principles, from engineering and funding perspectives. These meetings have also been utilized to keep Staff abreast of developing studies, initiatives, and project justification methodologies to support the evolution of distribution resource planning (DRP).

In comments, Staff raised a concern about the lack of emphasis on addressing transparency in distribution planning investments and activities in the IRP Update. While distribution system planning (DSP) is discussed in the IRP Update in Section 2.5.1, it is not a focus of the Update. The Commission's directions regarding DSP are for the next full IRP. Staff's comments acknowledge that PGE and Staff have made significant progress in this area² and PGE looks forward to continued work with Staff in the upcoming months.

² Staff's Comments at 8.

6. Gas Forecast and Wholesale Market Prices

In comments and data requests, Staff requested additional information regarding gas price forecasting and the decision to use a ten percent increase/decrease in hydro generation for the hydro scenarios.

The IRP Update uses an improved methodology for extrapolating gas prices after the end of the Wood Mackenzie long-term forecast in 2035. The extrapolation calculation in the 2016 IRP utilized the growth rate from the Wood Mackenzie forecast for 2033-2035 based on a recommendation from Wood Mackenzie. In later forecast updates, this methodology created large variations in the extrapolated prices for the outer years as Wood Mackenzie revised the 2033-2035 growth rates. PGE therefore looked for fundamentals-driven longer-term forecasts that could be used instead. The IRP Update calculation applies a growth rate post-2035 based on the average of the growth rates from two longer-term forecasts that extend through 2047 and 2050. This provides a more reasonable estimate of long-term growth rates in the outer years and will also likely provide more consistency between forecasts. This change and other minor updates are detailed in PGE's Response to OPUC Data Request No. 150.

Regarding the hydro scenarios, PGE used a ten percent increase/decrease because it is approximately one standard deviation of the reference case hydro generation.³

7. Avoided Cost Data

In commenting on the overnight capital cost of utility scale solar, Staff may have mistakenly referenced a technology curve provided by Black & Veatch (B&V) and compared it to the values in the IRP Update. PGE notes that the B&V report included in the 2016 IRP was used to inform thermal and storage resources. Solar costs were based on the DNV GL report provided in Appendix M of the 2016 IRP. It also appears that Staff may have confused forecasted cost changes due to different commercial operation dates (COD) and changes that occur between vintages of resource cost studies. This may have led to inaccurate conclusions about the data. As shown in Table 7 of the IRP Update, for a solar resource with a 2021 COD, the overnight capital cost declined by approximately 23% between the 2016 IRP and the IRP Update.

As discussed throughout the Update process, PGE is seeking acknowledgment of the IRP Update in order to update the following items in the May 1 avoided cost filing (in addition to the regularly updated items): supply-side resource costs and operating parameters, financial parameters, carbon offset costs, and incremental wind and solar capacity contribution values. All of these items were shared with stakeholders in advance of the filing of the IRP Update on March 8, 2018. The refreshed information provides a better estimate of cost and value and encompasses items that increase prices as well those that decrease prices.

³ See PGE's Response to OPUC Data Request No. 151.

8. Conclusion

For all of the reasons discussed in the 2016 IRP Update and in these Reply Comments, PGE respectfully requests that the Commission acknowledge its 2016 IRP Update at its April 24, 2018 Public Meeting.

DATED this 6th day of April, 2018.

Respectfully submitted,



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