BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

LC 73
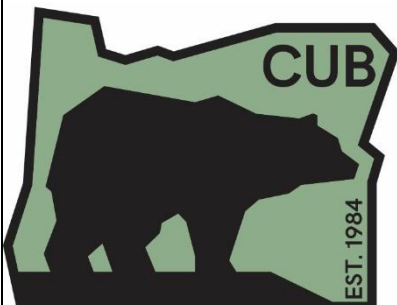
In the Matter of   )
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PORTLAND GENERAL ELECTRIC   )
COMPANY,   )
)
2019 Integrated Resource Plan.   )

OPENING COMMENTS

OF THE

OREGON CITIZENS' UTILITY BOARD

October 11, 2019

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In the Matter of	)	
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I.   INTRODUCTION

The Oregon Citizens' Utility Board (CUB) files these Opening Comments on Portland General

Electric's (PGE or the Company) 2019 Integrated Resource Plan (IRP or Plan) filed on July 19,

2019. CUB will continue to conduct discovery and review the Company's plan prior to

submission of Final Comments on November 13, 2019.

CUB applauds PGE for sincerely involving stakeholders throughout the 2019 IRP process,

including several pre-filing workshops. In its IRP, PGE's action plan is oriented towards

achieving the Company's commitment to cut its greenhouse gas emissions by more than 80% by

2050 while meeting its own resource needs. The action plan calls for obtaining a considerable

amount of customer resources, renewable resources, and market capacity through bilateral

negotiations. CUB believes that continuing to rely on carbon-intensive resources represents an

economic risk to customers and appreciates PGE's focus to reduce this risk, such as its plans to

acquire substantial customer resources as a potential alternative to new gas-fired plants. CUB's

Opening Comments will address the following:

a. PGE's Industrial Load Forecast

b. Regional Market

c. PGE's Action Plan Items

II.   DISCUSSION

A. *PGE's Industrial Load Forecast*

CUB has concerns regarding the level of industrial load forecasted in the IRP. CUB will discuss

several factors that may have contributed to what we perceive may be possible overestimation of

PGE's industrial load growth of 1.9% per year over the planning period. Our comments will

address the following:

1. Potential Direct Access Customers;

2. Green Tariff;

3. Energy Efficiency of Data Centers; and

4. Economic Drivers used in Industrial Load Forecasting.

Load forecasting is the foundation for utility resource planning, as it determines the resources

needed to meet this forecasted load. While CUB understand that no forecast is perfect,

nonetheless, accurate load forecasts are important to develop insights on the various risks that a

utility may face in the coming future while forecasting future load growth. The electric utility

world is undergoing major transformations arising from environmental regulations, decreasing

costs of renewable technologies, partial deregulation of electricity markets, and proposals to

electrify transportation and buildings. It is, therefore, crucial for utilities to have accurate load forecasts to inform their resource planning processes.

In its 2019 IRP, PGE forecasts long-term load growth in three customer rate classes, namely, the residential, the commercial and the industrial. In its reference case, PGE predicts residential sector growth to be 0.1%, the commercial sector to be 0.5%, and the industrial sector 1.9%, all on a per year basis. Evidently, the share of the industrial sector load growth, whose load growth is considerably higher than either other sector, is expected to be a key driver of system load growth long-term. In fact, the industrial load growth is much higher than the combined growth rates of residential and commercial sectors.

PGE points out that while the traditional lumber and paper manufacturing industries in its service area have declined, the future industrial load is primarily driven by the growth of high-technology sector, semiconductor manufacturing and data centers.[1]

CUB is concerned that, if the industrial load forecast is overstated, it will have further implications for the utility's RPS needs, system resource acquisition, and other investments, and PGE may seek to acquire resources that it does not actually need.

CUB believes that there may be several unaccounted-for factors in PGE's industrial load forecast that would drive down the predicted future load, if these factors were accurately quantified and accounted for.

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[1]PGE Integrated Resource Plan 2019, Chapter 4, p 91.

1. *Potential Direct Access Customers* –

PGE includes customers with load greater than 1 MWa in their industrial customer group. "As of the December 2018 billing cycle, approximately 93% of industrial energy deliveries were delivered to customers with aggregated loads greater than 1 MWa."[2] In producing its industrial load forecast, PGE makes the implicit assumption that none of these customers would opt for direct access. CUB is concerned that PGE is not accounting for the impact of New Load Direct Access and/or a possible relaxation of the cap on direct access in the future that could affect industrial load forecasts. The direct access program allows non-residential customers to leave the utility's system and buy electricity from a competitive third-party Electricity Service Supplier (ESS) at the market rate, either on a short-term (about one year) or a long-term basis. Although the direct access customer is required to pay a transition adjustment charge, once the customer leaves the system, direct access customers would stop paying towards the fixed cost of PGE's electricity system. This would then shift those fixed costs toward the remaining cost of service customers. CUB is concerned that there is no attempt to distinguish between small commercial and industrial customers and large commercial and industrial customers in the Plan. A fundamental premise of New Load Direct Access is that the utility does not plan for new customers over 1MWa. However, PGE's forecast makes **no attempt** to exclude those customers, so PGE is planning for these customers in this IRP. PGE does not reconcile this discrepancy in this IRP.

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[2] *See* Appendix A – LC 73 – PGE Response to CUB Data Request 1.

Recommendation: CUB would like to see the effect of excluding potential direct access and New Load Direct Access customers on the Company's industrial load forecast, and how this effect would affect the action plan delineated in the IRP.

2. *Green Tariff*

Under PGE's Green Tariff program, the utility provides its non-residential customers the option to procure renewable resources from a competitive third-party provider to meet all or part of their load. Unlike direct access, which allows the customers to leave the utility's system and purchase power from third party ESSs, Green Tariff customers remain customers of the utility, remaining on the cost of service schedule. The Green Tariff customers develop their own non-emitting resource and subsequently bring that resource to the system.

The Green Tariff customers could potentially bring in enough capacity and/or energy to the system to offset the need for PGE to procure new wind resources in the near term. A considerable number of customers enrolled within minutes when PGE recently made its first offering of the new non-residential Green Impact Program. These customers essentially committed to purchasing the output of a 160 MWa renewable facility. According to the Company, there are plans to extend this program in the near future.[3]

CUB understands that PGE's IRP includes sensitivity analyses for the Green Tariff and Community Solar programs.[4] Following the analysis, the Plan states that "there is a very low likelihood that these updates would materially impact PGE's near-term capacity and RPS needs.

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[3] Clearing UP, Issue No. 1916, Aug. 23. 2019, p 9.
[4] Portland General Electric 2019 Integrated Resource Plan, p121 of 678

PGE also considered potential uncertainties related to voluntary program participation and our energy position in the design on the Action Plan."[5]

Recommendation: CUB would like to know if the material impacts referred to in this analysis have been updated following the recent expansion in their green tariff program. CUB would also like more information on how the "potential uncertainties" were included and analyzed in this sensitivity exercise.

3. *Energy Efficiency in Data Centers*

As discussed above, PGE's future resource need is largely driven by growth in the industrial sector. PGE notes that the industries dominating its current service area are high technology, and specifically, semi-conductor industries and data centers.[6]

CUB would like to comment on electricity demand by data centers based on the Seventh Power Plan of the Northwest Power Council. As noted in the Council's plan, "the custom or stand-alone data centers are a fast-growing segment of electricity load in the Northwest."[7] The demand for customer data center service is forecasted to increase by seven percent per year. The pace of growth of these data centers is even more accelerated in Oregon due to recent tax legislation (SB 611).[8] These custom data centers alone could experience a load growth of 0.3-3 percent per year by 2035.[9]

[5] Portland General Electric 2019 Integrated Resource Plan, p123 of 678
[6] Portland General Electric 2019 Integrated Resource Plan, p91 of 678
[7] Seventh Northwest Conservation and Electric Power Plan, Appendix E, p-24
[8] https://olis.leg.state.or.us/liz/2015R1/Downloads/MeasureDocument/SB611
[9] Seventh Northwest Conservation and Electric Power Plan, Appendix E, p-24

Several custom data centers exist within PGE's service territory and the Company predicts further growth in their number. While data centers can drive up energy demand considerably, there is also ongoing and established research on various energy efficiency measures these centers may adopt that can lead to significant energy savings. The Council's report estimates energy savings for "embedded" data centers in four different technology scenarios which shows that with sufficient energy efficiency adoption, annual load from these could be as low as 100MWa by 2035. The figure below shows energy savings for embedded data centers as estimated in the report:[10]

Figure E - 49: Possible range of loads for embedded data centers
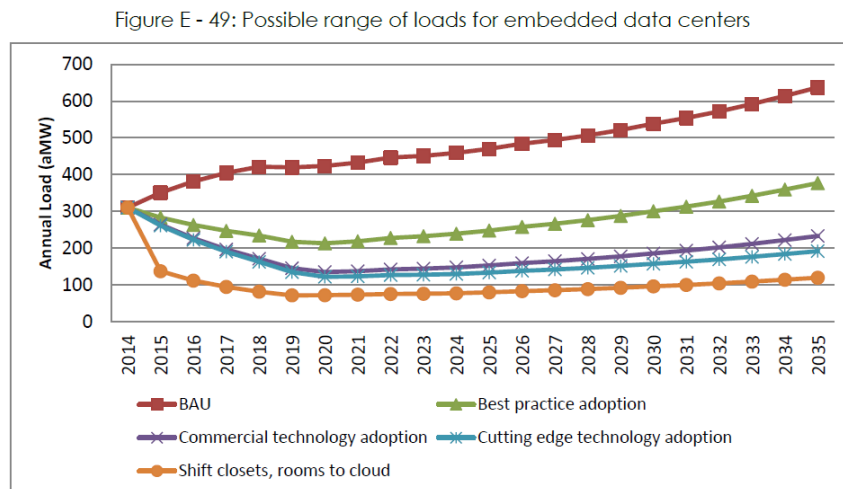
It is not clear from PGE's IRP if the Company and the ETO have explored sufficient energy efficiency opportunities in either embedded (which is typically included under the commercial sector load) or custom data centers (which is typically included under the industrial sector load) or both.

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[10] Seventh Northwest Conservation and Electric Power Plan, Appendix E, p-54

Recommendation: CUB believes that PGE's future IRPs should study this further given the significant energy savings potential of data centers.

4. *Industrial Load Economic Drivers*

PGE uses Real US Gross Domestic Product (GDP) as the main economic driver of its industrial load.[11] As pointed out by the company, PGE's service territory has undergone a structural transformation from being dominated by traditional lumber and paper industry to being primarily characterized by high-technology, including semiconductor manufacturing and data centers. CUB is concerned that US GDP is not reflective of this transformation that has happened in PGE's service territory. Typically, a utility's top-down load forecast models include macroeconomic indices for its entire service territory. Some frequently used indices include Gross State Product (GSP), Gross Metropolitan Product (GMP), GDP at the county level, GDP by industry sectors, price of electricity and so forth.[12] For example, PacifiCorp's 2017 IRP,[13] Appendix A, pg14, shows they included forecasts for Oregon's non-farm employment as the main economic driver for their industrial load forecast. The industrial landscape in Puget Sound Energy's (PSE) service territory is similar to PGE's. PSE uses manufacturing sector employment and also recent trends and projections in retail rates as drivers in their industrial load forecast model.[14] CUB believes that, in the light of current business practices from peer utilities in the region, the inclusion of service area macroeconomic variables as well as retail rates may improve the performance of the industrial load forecast model in PGE's IRP.

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[11] Portland General Electric, Integrated Resource Plan 2019, Appendix D, p256 of 678.

[12] "Load Forecasting Case Study" (2015), Eastern Interconnection States' Planning Council, Tao Hing (University of North Carolina, Chapel Hill) and Mohammad Shahidepour (Illinois Institute of Technology), Chap 1, p17. https://pubs.naruc.org/pub.cfm?id=536E10A7-2354-D714-5191-A8AAFE45D626

[13] http://pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2017_IRP/2017_IRP_VolumeII_2017_IRP_Final.pdf

[14] Puget Sound Energy Integrated Resource Plan. 2017, Appendix E, p-3. https://pse-irp.participate.online/

Recommendation: Based on the above comments CUB would like to make the following

recommendations:

a. Separate out the industrial load from the total load forecast and conduct specific risk
    analyses.

b. Provide additional analysis on the likelihood of current industrial loads greater than
    1MWa on PGE's system switching to long-term direct access over the planning period.

c. Provide an estimate of the renewable capacity and energy brought into PGE's system by
    green tariff customers and include these resources in the resource plan.

d. Have an in-depth energy efficiency analysis conducted for custom data centers.

e. Use alternative economic drivers in their industrial load forecast model, that capture the
    industrial landscape and trends in PGE's service area.

Long-term load forecasts should accurately reflect future uncertainties that are accounted for as

the Company plans to build its system over time. For instance, the High and Low Need scenarios

used in PGE's Portfolio Analysis provide a range of potential outcomes for the Company in

terms of resource planning. Any change in the Reference Case load forecast will therefore have

an impact on the range of portfolio choices that PGE would face. PGE might end up with a

different glide path as a result, and that in turn would impact PGE's action plan to procure these

resources. For instance, PGE's 2019 IRP action plan calls for customer resource actions in

response to Energy Trust of Oregon's (ETO) cost-effective energy-efficiency forecasts. ETO

uses PGE's long-term load forecast as one of the inputs that goes into these energy efficiency

calculations. Load forecast is an essential input to scale measure level savings to a utility service territory.

Secondly, PGE's near-term renewable action is largely driven by the Company's future RPS needs. SB 1547 places RPS requirements at 50 percent of retail sales by 2040. Future retail sales are determined by the long-term load forecast. An overestimated load forecast would mean overestimated future retail load and that would escalate the Company's future RPS requirements.

Further, PGE's action plan includes capacity actions such as staged bilateral negotiations for existing capacity and RFP for non-emitting resources for remaining needs. PGE envisions its capacity action as a staged process that is flexible enough to accommodate future uncertainties triggered by changes in load forecasts and economic conditions. PGE's resource needs in the long-term shape their action items in the near-term. Eventually customers are going to pay for these resources. Hence it is imperative that the Company load forecast is as accurate as possible in order that to captures future resource needs and uncertainties that PGE is planning for in its IRP.

Finally, a study by Corvallo et. al (2016)[15], finds that utilities with a larger share of industrial load in their mix generally had the largest forecast errors. According to them, the highly elastic and lumpy nature of industrial customer load could be contributing factors along with the high uncertainty related to the entry and exit of industrial customers from the utility's service area.

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[15]Juan Pablo Carvallo, Peter H. Larsen, Alan H. Sanstad, Charles A. Goldman, October 2016, "Load forecasting in Electric Utility Integrated Resource Planning" (LBNL-1006395), Energy Analysis and Environmental Impacts Division, Ernest Orlando Lawrence Berkeley National Laboratory.

The same study also points out that PGE has historically overestimated their average annual growth rate of net system load and their forecast errors are among the highest among other load service entities (LSEs) examined in the Northwest. The table[16] below is a snapshot from the study:

Table 13 **PGE**

Period	LSE-Projected AAGR	Actual AAGR
2007-2014	1.78%	0.23%
2009-2014	2.10%	0.09%
2012-2014	2.30%	-0.18%

Recommendation: CUB suggests that PGE address the issues pointed out in these comments and work on improving their industrial load forecast.

B. Regional Market

PGE's IRP does not include a discussion of regional markets. CUB understands that PGE is examining the possibilities of joining a to-be-created regional day-ahead market. The IRP would be an appropriate place to discuss the role of markets. While regional markets do not change the need for a utility to have the capacity and energy resources to serve its expected load, regional markets could affect resource planning directly by the following:

1. Reserve Margins. In theory, participating in a regional market with more and varied resources should reduce the need for a utility to carry reserves. Markets allow utilities to share reserves over a wider footprint. For example, one reason utilities carry reserves is to handle a catastrophic failure at a large generating plant. Since it is unlikely that all utilities within a defined market would experience catastrophic

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[16] *See supra* note 12.

failure at the same time, a regional market should reduce the amount of reserves each individual utility must maintain, since the market makes other utilities' reserve resource available.

2. Flexible Loads and Resources. PGE often discusses flexibility within this IRP. The analysis clearly demonstrates the need for flexible loads and resources and the benefit of flexibility. CUB would expect that a regional market would both contribute flexibility and add value to flexible resources–PGE could purchase or sell flexibility within the market. PGE's IRP should explain whether a regional market could reduce PGE's need for flexible resources and/or whether it would increase the value of flexible loads and resources.

3. Resource Dispatch. PGE's IRP attempts to model dispatch of their system in order to meet load. The IRP tests different resource portfolios to determine which will bring the best value of cost and risk. However, a regional market will fundamentally change the dispatch of resources. Examining how resource portfolios perform in a regional market would be informative and could influence the Company's portfolio selection.

Finally, CUB notes that examination of regional markets in an IRP could lead to a conclusion that the expansion of regional markets is part of a least cost/least risk resource plan and would allow PGE to include taking actions in support of expanding regional markets into its action plan. Broader participation is larger regional markets could also defer the need to build new resources to meet forecasted load, which could lead to great savings to customers.

C. PGE's Action Plan

i. Customer resource actions: PGE plans to acquire "all cost-effective energy efficiency which is forecasted by the Energy Trust of Oregon to be 157 MWa on a cumulative basis by 2025."[17] PGE also seeks to procure "all cost-effective and reasonable distributed flexibility" via winter and summer demand response programs, dispatchable standby generation and utility controlled customer storage. These add up to 493 MW on a cumulative basis.[18] CUB appreciates PGE's Smart Grid Test Bed pilot and believes the program is innovative and has the potential of bringing in cost-effective capacity resources into PGE's system. *Recommendation*: CUB recommends that the Commission acknowledge PGE's customer resource actions.

ii. PGE proposes to conduct a Renewables RFP in 2020, seeking up to approximately 150 MWa of RPS-eligible resources to enter PGE's portfolio by 2023.

In PGE's last IRP, CUB was supportive of the renewable glide path associated with the 50% IRP. While we are still supportive of the glide path, CUB's concern with the load forecast makes it difficult to endorse the proposed renewable acquisition. The renewables capacity that PGE has proposed to acquire in its IRP would be used to fulfill its RPS needs. The RPS need is dependent on an accurate load forecast and at this time CUB is not certain whether PGE's load forecast correctly estimates the annual average rate of industrial load growth for the long-term planning period.

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[17] Portland General Electric, Integrated Resource Plan 2019, p 33 of 678.
[18] Portland General Electric, Integrated Resource Plan 2019, p 33 of 678.

Recommendation: CUB has no recommendations at this time. We would like to hear the Company's response to the issues we raised regarding the industrial load forecast before filing our final comments.

iii. PGE proposes to conduct a staged bilateral negotiation process for existing capacity in the region. PGE would update the Commission and stakeholders on the status of these negotiations and also, conduct an RFP for non-emitting resources to meet its remaining capacity need.

CUB's recommendation: CUB recommends that the Commission acknowledge PGE's capacity action.

III.   CONCLUSION

CUB appreciates PGE's efforts in designing the IRP and for engaging stakeholders in the process. The Company's Plan certainly reflects its commitment towards providing clean renewable energy to its customers. CUB commends the Company for commissioning the decarbonization study for its service area.

CUB has mixed views regarding its Action Plan:

a) CUB supports the Company's plan to acquire all cost effective and reasonable customer resources. CUB recommends acknowledgement of PGE's Customer Resource Action.

b) CUB also backs PGE's plan to engage in bilateral market transactions for regional capacity and hence recommends acknowledgment of PGE's capacity action.

c) CUB is not convinced that PGE's load forecast is accurate. Since the renewable glide path is based on this forecast, it is unclear that the plan necessitates acquiring

150aMW of renewable resources. Currently CUB does not have any recommendation regrading PGE's renewables action.

d) CUB also recommends the Company examine the benefits of joining a regional market.

CUB looks forward to PGE's response to the issues raised in these opening comments.

Dated this 11th day of October, 2019

Respectfully submitted,

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July 10, 2019

TO: Sudeshna Pal
               Citizens' Utility Board

FROM: Jay Tinker
               Director, Rates and Regulatory Affairs

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PORTLAND GENERAL ELECTRIC
LC 73
PGE Response to CUB Data Request No. 001
Dated June 26, 2019

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Request:

On Page 220 of Appendix H, PGE states that the long-term models have "three forecast groups based on revenue class: residential, commercial, and industrial". Please provide answers to the following:

    a. **Does the industrial customer group include industries with load greater than 1aMW?**

    b. **What percentage of industrial load is customers with load greater than 1aMW?**

Response:

    a. Yes, the industrial group includes industries with load greater than 1 MWa.

    b. As of the December 2018 billing cycle, approximately 93% of industrial energy deliveries were delivered to customers with aggregated loads greater than 1 MWa. Note that in PGE's long-term forecast models, "industrial" is defined as load in Revenue Classes 4 and 5.