ITEM NO. CA15

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: October 20, 2020

REGULAR ____ CONSENT X EFFECTIVE DATE October 23, 2020

DATE: October 12, 2020

TO: Public Utility Commission

FROM: Eric Shierman

THROUGH: Bryan Conway, JP Batmale, and Sarah Hall **SIGNED**

SUBJECT: PORTLAND GENERAL ELECTRIC:
(Docket No. ADV 1151/Advice No. 20-18)
Schedule 8 Residential Electric Vehicle Charging Pilot.

STAFF RECOMMENDATION:

Staff recommends the Public Utility Commission of Oregon (Commission) approve Portland General Electric's (PGE or Company) filing as described in Advice No. 20-18, which implements a new Residential Electric Vehicle Charging Pilot through Schedule 8, with an effective date of October 23, 2020.

DISCUSSION:

Issue

Whether the Commission should approve PGE's filing that requests the adoption of Schedule 8, which establishes a new Residential Electric Vehicle Charging Pilot.

Applicable Rule

Under ORS 757.357(3), the Commission shall direct each electric company to file applications for programs that would accelerate transportation electrification (TE). Under ORS 757.357(4), the Commission shall consider whether the program's investments and other expenditures are:

1. Within the service territory of the Company;
2. Are prudent;
3. Are reasonably expected to be used and useful;

4. Are reasonably expected to improve the Company's electrical system efficiency and operational flexibility, including the Company's ability to integrate variable generating resources; and
5. Are reasonably expected to stimulate innovation, competition and customer choice in electric vehicle charging and related infrastructure services.

Under OAR 860-087-0030, a Company must file an application with the Commission for each program that seeks to accelerate TE. OAR 860-087-0030(1) details what the Company must include in its Program application. Broadly, these requirements include:

(a) A description of the program;
(b) Data used to support the description;
(c) A description of program coordination;
(d) A description of the electric company's long-term strategy to accelerate transportation electrification in its service territory in an effective and efficient manner and how the proposed program fits within the long-term strategy;
(e) A description of program costs;
(f) A description of the expected program benefits;
(g) A description of how the electric company will evaluate the program; and
(h) A description of how the program addresses the considerations of Oregon Laws 2016, 028, section 20(4)(a)-(f).

Analysis

Background
On December 27, 2016, PGE first filed an application for TE programs as required by ORS 757.357. In that filing, the Company proposed a "bring your own charger" (BYOC) demand response (DR) demonstration project.[1]

On April 24, 2017, Staff recommended rejecting this proposal. Staff's rationale was as follows:

> PGE's proposal for a residential demand response pilot should not be approved at this time. While the program has inherent merit, there is not enough evidence in PGE's testimony to conclude that PGE has had enough experience with EV [electric vehicle] owners on time-of-use (TOU) rates and the development of specific EV time-of-use rate design. Once PGE makes a convincing showing that they have made every effort to sign up EV owners to a TOU rate, and constructed and properly funded a time-

[1] *See* Docket No. UM 1811, Portland General Electric Company, Application for Transportation Electrification Programs, Transportation Electrification Plan, December 27, 2016, p. 10.

> of-use rate program for EV drivers, Staff recommends the proposal for a demand response home charger program be resubmitted to the Commission for review. At present there is no evidence that PGE's DR pilot program will be additive to their time-of-use efforts or that such an effort will improve PGE's electrical system efficiency and operational flexibility beyond a properly designed and managed time-of-use rate offering.[2]

On February 16, 2018, the Commission agreed and issued Order No. 18-054, approving a stipulation where the stipulating parties agreed that PGE would later file a residential home charging pilot with a rebate program:

> This pilot, which PGE had originally included in its application but withdrew as part of the stipulation, includes rebates for customers installing a connected level 2 charger and going on a time-of-use rate schedule. Noting that a majority of EV charging continues to occur at home, CUB notes that this future pilot was an essential component of its support of the stipulation, and was intended to help the program application meet the criteria contemplated in SB 1547 Section 20(2)(d)-(e). The stipulating parties agree that PGE will propose this pilot within one year of Commission approval of the stipulation.[3]

On February 15, 2019, PGE re-filed a residential EV charging pilot program.[4] Staff found this proposal to violate the terms of UM 1811's stipulation. Parties negotiated a second stipulation, which the Commission approved on November 7, 2019, in Order No. 19-385. This new stipulation allowed a TOU rate to be optional and authorized a mandatory DR component:

> PGE agrees to propose a residential charging pilot, which includes rebates for customer installation of a connected level 2 home charger within one year of Commission approval of this plan. In exchange for accepting a rebate from PGE, the customer will be automatically enrolled in an EV-charging demand response pilot program. Customers participating in the residential charging pilot may also choose to go onto a time-of-use rate schedule and will be given the opportunity to do so at the

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[2] *See* Docket No. UM 1811, Portland General Electric Company, Application for Transportation Electrification Programs, Staff Exhibit, April 24, 2017, p. 4.
[3] *See* Docket No. UM 1811, Portland General Electric Company, Application for Transportation Electrification Programs, Order No. 18-054, February 16, 2018, p. 5.
[4] *See* Docket No. UM 1811, Portland General Electric Company, Application for Transportation Electrification Programs, Electric Vehicle Charging Program and Pilot, February 15, 2019, p. 13-30.

> time of application for the rebate. The EV charging rebate application process will connect to the time-of-use enrollment process with applicable information when selected by the customer.[5]

On July 15, 2020, PGE filed Advice Number 20-18. This filing increases the cap on participants from 3,600 to 5,000. Otherwise, the proposal is very similar to what was proposed last year, because the second stipulation ultimately agreed to the basic pilot design PGE proposed in 2019.

OAR 860-087-0030 Requirements
The Commission established eight requirements for a TE program application in OAR 860-087-0030(1). Broadly, the requirements are:

(a) A description of the program;
(b) Data used to support the description;
(c) A description of program coordination;
(d) A description of the electric company's long-term strategy to accelerate transportation electrification in its service territory in an effective and efficient manner and how the proposed program fits within the long-term strategy;
(e) A description of program costs;
(f) A description of the expected program benefits;
(g) A description of how the electric company will evaluate the program; and
(h) A description of how the program addresses the considerations of Oregon Laws 2016, 028, section 20(4)(a)-(f).

Staff finds that PGE's Advice No. 20-18 filing meets the requirements. PGE will provide a $500 standard rebate and $1,000 low-income rebate for customers who purchase a qualified level 2 home charging station and are automatically enrolled in an EV DR program.

The Company's objective is to sign up 5,000 customers by February 22, 2024. During this time, PGE expects to sign up an additional 1,340 residential customers in the DR program on a BYOC basis.

The research outcomes of this pilot are to: learn how to increase adoption of electric vehicles and grid-connected home charging stations by enhancing the customer's value proposition; learn how to decrease the costs to serve EV loads by minimizing bulk system capacity needs and constraints, as well as non-coincident peak loads to minimize the need for distribution system upgrades; provide PGE the learnings and

[5] *See* Docket No. UM 1811, Portland General Electric Company, Application for Transportation Electrification Programs, Order No. 19-385, November 7, 2019, p. 7.

experience necessary to efficiently scale this and similar pilots to a full-scale program; study home charging load profiles and gain awareness of charging deployments across the distribution system; and learn how to use home charging telemetry (e.g. specialized billing, such as sub-metered time-of-use).

PGE's planning relies on some key assumptions about the EV market, estimating that between Q4 2020 and 2023 there will be 17,000 new, incremental EV sales in the Company's service area. PGE assumes 7,700 will be equipped with EV home chargers that will qualify for participation in this pilot. One significant reason this number is lower than the number of EV sales is that, in addition to the broader challenges of electrifying transportation, a specific market challenge to this program is that some manufacturers' electric vehicle service equipment (EVSE) are not DR-enabled. PGE is in dialogue with these original equipment manufacturers (OEM) to resolve this problem. The market share of the DR-enabled EVSE that PGE needs its customers to purchase will be a factor in this pilot's success.

The Company has provided data supporting its description of this pilot program. Parts of this requirement were met through discovery. Through responses to information requests and holding a meeting for follow-up questions, the Company has been helpful in providing any additional information Staff needed to inform its analysis.

The Company has described the pilot program's coordination and related plans. PGE engaged with stakeholders in UM 1811, which involved extensive dialogue and negotiations. PGE has maintained this conversation with stakeholders through regular public workshops. The execution of this pilot will require coordination with auto dealers and electricians. The effectiveness of PGE's working relationship with these other EV market players will be a factor in this pilot's success.

In addition to paying rebates to program participants, this pilot will pay referral incentives of up to $100 per referral to dealers, trade allies, PGE employees, and community-based organizations. The expected level of expenditure on these payments that PGE included in its cost-effectiveness analysis is $375,000 paid to dealers. If all program participants required a referral payment, then the expenditure would be $500,000. To put that into perspective, the entire budget the Commission has authorized for PGE's Outreach and Technical Assistance pilot is $480,000.

PGE's long-term strategy is to electrify other sectors of the economy with a special focus on the transportation sector. This pilot may help accomplish that. A strategic consequence of this pilot may be the signal to EVSE manufacturers to sell products that are DR-enabled. EV buyers in the Company's service territory who buy products that

are not DR-enabled will encounter a path-dependent exclusion from PGE's EV DR program.

The total program cost is $16,986,000 (nominal), $11,451,000 (NPV), not including the participants' cost of $9,950,000 for the rest of the EVSE installation cost.[6] Order No. 19-385 set a $1 million budget for the other pilot, a non-residential charging program, but the Commission left the size of the residential program's budget open. At roughly 17 million dollars, this pilot will be considerably more expensive. The relative difference in size can be seen to reflect the relative difference in energy outlays. The vast majority of EV charging happens at home. Therefore, the number of residential charging ports can be expected to exceed the number of non-residential ports. Additionally, this program is more than just a rebate program, as it has a DR component that adds cost and years to the length of the program. These expenditures will be stretched out over fourteen years.

This program will come with a third-party project evaluator that will conduct modeling, data analysis, interviews of pilot staff, survey participants, and interviews of dealerships and trade allies. Set into two phases, the first phase will produce a report next year (2021). The second phase will produce a final report in the spring of 2024. The results of the final evaluation should help inform the Commission's decision whether to authorize this pilot to become a permanent program. Staff is concerned the timing of this final report might come too late. If the Company ultimately seeks to make this pilot a permanent program, the final project evaluation should be released before or at least when PGE files an advice letter for the program application.

This pilot's $3.2 million administrative cost might require later prudence scrutiny. The Commission approved $580,000 for project evaluation of UM 1811's first three pilots: Outreach and Technical Assistance, TriMet, and Electric Avenue. This residential charging pilot proposes to spend $400,000 for the evaluation of only one.[7]

Similarly, the Company is requesting four new full-time equivalent positions, three temporary information technology positions in the pilot's first year and a product manager. Since this is one of many pilots that PGE will be running, Staff wonders why the marginal increase in labor from this pilot cannot be carried more by the Company's existing IT and product development personnel. Staff expects synergies to emerge across programs and will look for such overhead to be shared across pilots. A prudence review will need to explore the allocation of such cross-cutting support staff in more depth in future rate cases. Staffing inefficiencies might explain why the Company's own

[6] A customer's portion of the installation cost after receiving a standard rebate, amounts to eight percent of the price of a new Chevy Bolt, one of the less expensive electric vehicles.
[7] PGE. Email from Christopher Pleasant to Eric Shierman, October 7, 2020.

estimate of this pilot's cost-effectiveness finds it barely "breaks even." Staff expects the economic use of overhead to be explored more as part of future program updates.

The benefits the Company estimates come from avoided capacity costs and added revenue. PGE expects the DR component of this pilot to reduce peak demand by 2.6 MW when the DR component reaches 5,885 participants in year five, but that is not a net reduction. The rebate component is assumed to have put 4,289 EVs on the road in that year, increasing peak demand by up to 3.4 MW. Therefore, on net, there is no reduction in capacity need.

The actual net impact of this program on capacity is uncertain because some of the Company's assumptions may have underestimated or overestimated the incremental capacity need. This filing assumes 20 percent of program participants will be on Schedule 7's TOU option. The current percentage is 0.3 percent, therefore the Company's estimate may be underestimating the average capacity requirement.[8] Additionally, the capacity requirement of the new EVs may be overestimated, because many of the EVs participating in the rebate program would have been purchased regardless of the rebate program's existence.

Cost-Effectiveness
Overestimating the number of EVs that are in the Company's service territory *but for* the existence of the rebate program is the methodological problem of attribution. PGE has asserted attribution should not be included in cost-effectiveness calculations.[9] A consequence of that choice would be leaving the increase in capacity need undefined. However, in this filing, PGE has not left that number undefined. By totaling the capacity requirement of every rebate participant, PGE is assuming an attribution of 100 percent. That appears unreasonably high, underestimating this program's net impact on system capacity need. Assuming an attribution of 100 percent would also have the effect of overestimating the benefit from new revenue.

Information the Company has filed indicates this is an unreasonably high assumption. In the Company's initial UM 1811 filing, for example, Navigant, the consultant PGE hired to conduct the cost-effectiveness assessment of the first three TE programs, found PGE's overall impact to raise the number of EVs in its service territory by 3.4 percent.[10] If the Company has reason to believe a residential rebate program will have a higher rate of

[8] *See* Docket No. ADV 1151, PGE Schedule 8, Adv. No. 20-18, Residential Electric Vehicle Charging Pilot, PGE Response to OPUC Information Request No. 008, October 2, 2020, p. 1.
[9] *See* Docket No. UM 1811, Portland General Electric Company Application for Transportation Applications, PGE's Transportation Electrification Compliance Filing per Order no. 18-054, February 15, 2019, p. 12.
[10] *See* Docket No. UM 1811, Portland General Electric Company Application for Transportation Electrification Programs, December 27, 2016, p. 14.

attribution, PGE should present a basis for this belief. This research question can also be taken up by the project evaluation's survey of program participants. The survey could ask: "If this rebate program did not exist, would you still have purchased an electric vehicle?"

Societal benefits are notably absent from the Company's cost-effectiveness analysis of the rebate component of this pilot. PGE has asserted the need to include societal benefits in TE cost-effectiveness.[11] If the social cost of carbon and the monetary value of improved local air quality is higher than the state and federal subsidies for buying an EV, this exclusion would have underestimated the benefit of the rebate component of this program.

Staff finds assumptions the Company has made in its cost-effectiveness analysis of the DR component of this pilot may underestimate the net benefit of a residential EV DR program. The preferred portfolio of PGE's 2019 IRP does not plan to acquire a simple cycle natural gas plant. Instead, PGE plans to hold a non-emitting RFP for a capacity resource. So $103 per kW-year is likely too low a cost for capacity. A more accurate proxy resource for comparison might be a six hour lithium ion battery whose avoided cost has a price range of $150 kW-yr to $250 kW-yr. Additionally, the administrative costs of the DR component have expenditures unique to starting up the pilot that may significantly decline in a long-term analysis of this pilot as a permanent program.

With a benefit/cost ratio of 1.23 on an NPV basis, PGE estimates a net benefit for the rebate portion of this pilot program. This will be true if the benefits of the electric vehicles that exist, but for the payment of this program's rebate, are greater than the total cost of the rebate program. With a benefit/cost ratio of .48 on an NPV basis, PGE estimates there will be no net benefit of the DR portion of this pilot. This will be true if the estimated value of capacity and administrative costs are accurate. When both components are added together, PGE estimates the benefit/cost ratio of this pilot to be 1.04, barely breaking even. This is a different result than PGE's estimate of the cost-effectiveness of the Company's 2019 residential EV charging pilot, which found a combined NPV benefit/cost ratio of .71 and a $3.9 million loss.[12]

Because this is an application for a pilot, cost-effectiveness itself is an aspect of the program that will be learned. Staff has found aspects of the Company's cost-effectiveness method to both underestimate and overestimate both benefits and costs, but these discrepancies need not prevent this pilot from moving forward. To be consistent with the Commission's prior decisions in UM 1811, Commission approval of

[11] *Id*. at p. 82.
[12] *See* Docket No. UM 1811, Portland General Electric Company, Application for Transportation Applications, *Electric Vehicle Charging Pilot Program Proposal* UM 1811, February 15, 2019, page 9.

this pilot would be made before the methodology of cost-effectiveness has been decided. If the Commission is called upon to decide to graduate this pilot into a permanent program, then a definitive cost-effectiveness assessment will become necessary. Before that happens, Staff will be holding public workshops to discuss a range of issues, including cost/benefit analysis.

Reason for Staff Recommendation
In Order No. 19-385, the Commission gave partial approval to a residential charging pilot that meets the terms of the stipulation. Staff finds the details of PGE's proposed Schedule 8 to meet those terms. Additionally, the Company's application satisfies all program requirements detailed in OAR 860-087-0030.

Staff is hopeful this pilot will show a long-term residential charging program can be cost effective. Additionally, there are three valuable deliverables that could come out of this pilot. First, this pilot will send signals to OEMs that their home EVSE products need to be DR-enabled. Second, PGE's advice letter explicitly states the Company will be studying the feasibility of offering an EV-only TOU option. This has been a priority for the Citizens' Utility Board and Staff has been supportive of this in UM 1811 and UM 2033. Third, the Company's next TE plan can be informed by preliminary analysis of observed residential EV charging behavior.

Conclusion

Staff recommends the Commission approve Schedule 8, PGE's residential charging pilot.

PROPOSED COMMISSION MOTION:

Approve PGE's filing as described in Advice No. 20-18, which implements a new Residential Electric Vehicle Charging Pilot through Schedule 8, with an effective date of October 23, 2020.