



# Oregon

Kate Brown, Governor

**Public Utility Commission**

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November 29, 2022



BY EMAIL

Portland General Electric Company

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RE: Advice No. 22-24

At the public meeting on November 22, 2022, the Commission adopted Staff's recommendation in this matter docketed as ADV 1437. The Staff Report and a receipted copy of the sheets in your advice filing are attached.

Nolan Moser

Chief Administrative Law Judge

Public Utility Commission of Oregon

(503) 378-3098

**PUBLIC UTILITY COMMISSION OF OREGON  
STAFF REPORT  
PUBLIC MEETING DATE: November 29, 2022**

**REGULAR**  **CONSENT**  **EFFECTIVE DATE** January 1, 2023

**DATE:** November 21, 2022

**TO:** Public Utility Commission

**FROM:** Nick Sayen

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

**SUBJECT:** PORTLAND GENERAL ELECTRIC:  
(Docket No. ADV 1437/Advice No. 22-24)  
Requests approval to revise Schedule 13 Smart Grid Testbed removing Phase I activities and beginning Phase II activities.

**STAFF RECOMMENDATION:**

Approve Portland General Electric's (Company or PGE) Advice No. 22-24.

**DISCUSSION:**

Issue

Whether the Oregon Public Utility Commission (Commission) should authorize the revision of Schedule 13 removing Smart Grid Testbed (SGTB or Testbed) Phase I activities and beginning Phase II activities.

Applicable Rule or Law

Under ORS 757.205(1):

Every public utility shall file with the Public Utility Commission, within a time to be fixed by the commission, schedules, which shall be open to public inspection, showing all rates, tolls and charges which it has established and which are in force at the time for any service performed by it within the state, or for any service in connection therewith or performed by any public utility controlled or operated by it.

When a utility modifies an existing tariff or schedule or files a new tariff, OAR 860-022-0025(2) requires the utility to file a statement plainly indicating (a) the increase, decrease, or other changes made with the filing, (b) the number of customers affected by the proposed change and the resulting change in annual revenue, and (c) the reasons or grounds relied upon in support of the proposed change.

OAR 860-022-0015 requires utilities to file tariff changes with Commission at least 30 days before the effective date of such changes.

In Order No. 17-386, the Commission directed PGE to establish a Testbed to explore ways to accelerate development of cost-effective demand response to meet PGE's capacity need. The Commission also directed PGE to convene a Demand Response Review Committee (DRRC) to provide guidance in developing the Testbed.<sup>1</sup>

## Analysis

### *Background*

On October 1, 2021, PGE filed its Smart Grid Testbed Phase II Proposal.<sup>2</sup> The Proposal presented six new demonstration projects as part of a five-year \$11 million effort. The Commission approved Phase II on November 30, 2021.<sup>3</sup> PGE proposes in this filing to implement two of the six Phase II demonstration projects, the Smart Solar Study and the Electric Vehicle (EV) Charging Study. In discussions with Staff, the Company confirmed it was not proposing changes to any previously-approved aspects of those projects. Instead, in this filing, the Company provides implementation-level details for two of the six already-approved pilots in SGTB Testbed Phase II. This approach is consistent with Staff's expectations of updating Schedule 13 incrementally or in a manner that will broadly allow for the demonstration projects without multiple revisions.<sup>4</sup>

This memo provides background to the SGTB, summary of the Company's proposed changes via Schedule 13, discussion of transportation electrification (TE) budget and demand-side resources, and review of stakeholder feedback/involvement. The memo concludes with Staff's recommendation to approve the Company's filing.

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<sup>1</sup> See Docket No. LC 66, Order No. 17-386,

<https://apps.puc.state.or.us/edockets/orders.asp?OrderNumber=17-386>.

<sup>2</sup> See Docket No. UM 1976, PGE's Smart Grid Testbed Phase II Proposal,

<https://apps.puc.state.or.us/edockets/edocs.asp?FileType=HAD&FileName=um1976had145212.pdf>.

<sup>3</sup> See Docket No. UM 1976, Order No. 21-444,

<https://apps.puc.state.or.us/edockets/orders.asp?OrderNumber=21-444>.

<sup>4</sup> See Docket No. UM 1976, Staff Report, page 10,

<https://apps.puc.state.or.us/edockets/edocs.asp?FileType=HAU&FileName=um1976hau114337.pdf>.

In 2018, in accordance with Order No. 17-386, PGE formed the DRRC, a group of regional demand response experts.<sup>5</sup> The Company engaged the group in development of a Testbed proposal, which the Company filed with the Commission in October 2018.<sup>6</sup> On April 9, 2019, the Commission approved a new Schedule 13 that launched the Testbed.<sup>7</sup> The Testbed has been comprised of geographically limited areas served by three substations in Milwaukie, Hillsboro, and North Portland that collectively serve approximately 20,000 PGE customers. The Testbed provides a venue for small scale, localized demonstrations of demand response offerings that have potential to scale. This approach provides rapid learnings at minimal cost.

The Testbed was designed with two phases. In Phase I, residential customers within the Testbed were automatically enrolled in the Peak Time Rebates pilot and received a pay-for-performance incentive when they voluntarily reduced load in response to a day-ahead notice from PGE. The Company studied the performance of this opt-out model and explored how different customer value propositions motivated customers to participate in the pilot. Phase I was designed with the recognition that acquiring demand response resources requires not just one-time customer acquisition, but ongoing customer engagement and motivation to ensure participation in utility-called demand response events. While Phase I ended after 2021, on June 28, 2022, the Commission approved an extension of Schedule 13 from June 30, 2022, to December 31, 2022.<sup>8</sup> This allowed for additional data collection for final Phase I evaluation activities and a transition to Phase II. Phase I received its final evaluation in March 2022.<sup>9</sup>

### *Summary of Proposed Changes*

#### *1. Implement the Smart Solar Study*

The Smart Solar Study aims to enroll customers with photovoltaic (PV) arrays equipped with smart inverters (those equipped with the IEEE 1547-2018 Standard). PGE will study utilizing inverter-based controls to: deliver value to distribution operations; address hosting capacity issues; and modulate distributed energy resources both as a demand response resource for generation and as distribution-level load balancing.

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<sup>5</sup> DRRC membership includes but is not limited to Energy Trust of Oregon, Northwest Energy Efficiency Alliance, Pacific Northwest National Lab, Oregon Citizens' Utility Board, Oregon Department of Energy, Alliance of Western Energy Consumers, Northwest Power and Conservation Council Staff, and Commission Staff.

<sup>6</sup> See Docket No. ADV 859, Initial Utility Filing, Attachment A, <https://apps.puc.state.or.us/edockets/edocs.asp?FileType=UAA&FileName=uaa173123.pdf>.

<sup>7</sup> See Docket No. ADV 859, <https://apps.puc.state.or.us/edockets/DocketNoLayout.asp?DocketID=21643>.

<sup>8</sup> See Docket No. ADV 1397, <https://apps.puc.state.or.us/edockets/DocketNoLayout.asp?DocketID=23299>.

<sup>9</sup> See Docket No. UM 1976, Final Evaluation of PGE's Demand Response Testbed Project, <https://edocs.puc.state.or.us/efdocs/HAE/um1976hae155256.pdf>.

**Previously approved** – These key elements of the Smart Solar Study from the Testbed Phase II Proposal were previously approved by the Commission:<sup>10</sup>

- The three-year effort will aim for 500 participants with smart inverters, totaling over 4 MW of aggregate capacity.
- The customers will be located on three feeders: two rural feeders at or near hosting capacity limits, and one urban feeder with power quality issues.
- The Study has a budget of \$1,000,000 which covers PGE incremental staffing, a contract with the National Renewable Energy Laboratory, inverter manufacturer fees for control software integration and cloud service, a contract with the Energy Trust of Oregon for project management, customer incentives and recruitment, and third-party evaluation.

**Proposed in this filing** – The following are new elements proposed in this filing:

- The Smart Solar Study will run for two years, concluding on December 31, 2024.
- PGE Schedule 7 and Schedule 32 customers may be eligible to enroll if located within a testbed's geographic region as defined on the SGTB webpage, and have interconnected PV systems behind-the-meter with qualifying smart inverters as defined on the SGTB webpage.
- The targeted number of participants remains 500, unchanged from the Phase II Proposal.
- Incentives will be \$250 for enrollment and an ongoing \$10 per month for continued participation. These were determined via a feedback forum with solar installers conducted in Phase I by the Energy Trust of Oregon.

Staff notes that after the Commission approved Phase II in November 2021, work restarted in the Interconnection Modernization Investigation in Docket No. UM 2111. This included a specific workstream related to adopting the IEEE 1547-2018 Standard. In light of this, Staff asked PGE to review how these efforts relate to one another, specifically whether there is potential for overlap and redundancy. The Company responded that the efforts were complimentary. Should work in Docket No. UM 2111 lead to adoption of the IEEE 1547 Standard, then new PV arrays would be equipped with inverters with smart capabilities. Work in the Smart Solar Study will help PGE determine how to utilize those smart capabilities. Staff accepts the Company's view that the two efforts can be complementary but only insofar as PGE is fully involved in, and responsive to, the findings and direction from Docket No. UM 2111 as the activities embodied in the Smart Solar Study should reflect Commission policy direction.

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<sup>10</sup> See for further detail Docket No. UM 1976, PGE's Smart Grid Testbed Phase II Proposal, Appendix C, <https://apps.puc.state.or.us/edockets/edocs.asp?FileType=HAD&FileName=um1976had145212.pdf>.

Staff supports the proposed Smart Solar Study as it implements the parameters of the demonstration project already approved in the SGTB Phase II proposal and can help inform and prove out policy direction coming from Docket No. UM 2111.

## *2. Implement the EV Charging Study*

The EV Charging Study aims to complement the Company's existing Residential Electric Vehicle Charging Pilot (Schedule 8). The study targets a high concentration of EV charging to demonstrate the impacts of managed charging on customer acceptance, power quality, reliability, and operational flexibility of the grid.

**Previously approved** – These key elements of the EV Charging Study from the Testbed Phase II Proposal were previously approved by the Commission:<sup>11</sup>

- Through the three-year effort PGE will utilize on-board telematics as a communication channel to the vehicle, instead of the electric vehicle supply equipment (EVSE, also known as a charger). Some EV owners recharge their vehicles using a home EVSE that is network capable and can thus participate in utility charging programs. However, some home EVSE are not network capable and one manufacturer, Tesla, doesn't manufacture networked home chargers. While Tesla owners can purchase networked EVSE commonly used with other EVs, they tend not to, and are less likely to participate in utility charging programs. Tesla vehicles constitute a large portion of Oregon EV registration data, and together with non-networked EVSEs, present a major challenge to utility charging program enrollment.<sup>12</sup> Utilizing on-board telematics may allow PGE to call DR events and manage charging for EV owners with non-networked EVSEs. The Company's existing evPulse Pilot is currently testing the use of on-board telematics; the EV Charging Study compliments the evPulse Pilot as described in the bullet below.
- The Study will actively control the time, rate, and/or duration of EV charging to best respond to grid considerations while ensuring vehicles maintain minimum charge needed by participants. In contrast, current offerings, including the

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<sup>11</sup> The Study as proposed in PGE's Smart Grid Testbed Phase II Proposal also includes a Vehicle-to-Grid (V2G) component. Including the EV Charging Study component proposed in this filing, the budget was \$2.5 million and targeted 800-1,200 participants. The V2G component may be tested in the future but is not included in this filing. See for further detail Docket No. UM 1976, PGE's Smart Grid Testbed Phase II Proposal, Appendix B,

<https://apps.puc.state.or.us/edockets/edocs.asp?FileType=HAD&FileName=um1976had145212.pdf>.

<sup>12</sup> As of July 2022, Oregon EV registration data showed Tesla vehicles constituted approximately 32 percent of the EV market. See Oregon Electric Vehicle Dashboard, ZEV Registrations data, accessed November 16, 2022, <https://www.oregon.gov/energy/Data-and-Reports/Pages/Oregon-Electric-Vehicle-Dashboard.aspx>



evPulse Pilot, operate as traditional demand-response programs, with the simplistic in-comparison goal of shaving peak load.

- The Study has an initial budget of \$872,200 for PGE incremental staffing, licensing for the telematics platform and vehicle control, customer incentives, simulation of dispatch value based on grid conditions, customer recruitment, and third-party evaluation.

**Proposed in this filing** – The following are new elements proposed in this filing:

- The EV Charging Study will run for two years, concluding on December 31, 2024.
- Schedule 7 customers may be eligible to enroll if located within a testbed's geographic region as defined the SGTB webpage, and have a qualifying EV as defined on the SGTB webpage and a Level 2 EVSE. Customers must also first enroll in Schedule 8.
- The targeted number of participants is 500.
- Incentives will be \$20 per month for continued participation. This amount is in addition to incentives customers are eligible for from participating in Schedule 8 and or the evPulse pilot.

Staff provided feedback to PGE that the relationships between the proposed EV Charging Study, the existing evPulse pilot, and the existing Smart Charging Program were not sufficiently clear. Staff requested clarity on relative program eligibility, incentives, communication channels, and rate schedules, and encouraged the Company to consider creating a visual aide. In response to this request, the Company developed Attachment A, depicting how the EV Charging Study layers onto the existing offerings, and the various incentive pathways available to customers under the PGE Residential EV Charging Pilot Program.<sup>13</sup> Staff has included Attachment A at the end of this memo. Staff appreciates PGE's time and effort responding to Staff's feedback.

Staff supports the proposed EV Charging Study as it implements the parameters of the demonstration project already approved in the SGTB Phase II proposal.

#### *Interrelated Planning Areas*

Staff notes three related and complementary types of planning. Staff broadly characterizes these as: 1) Grid interaction and optimization, addressed in Flexible Load Planning; 2) Grid infrastructure to enable specific, programmatic investments and activities, addressed in Distribution System Planning; and 3) TE infrastructure and programmatic activities, addressed through TE Planning.

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<sup>13</sup> See Docket No. ADV 1437, Initial Utility Filing, Attachment A, <https://edocs.puc.state.or.us/efdocus/UAA/uaa104736.pdf>.

Grid integration of EV load can fall between two categories: it can be seen strictly as an expenditure on flexible load (a demand-side resource), or it could be integral to an infrastructure measure (a TE Budget expenditure). Staff believes utilities should have the flexibility to place EV grid integration expenditures in either the TE Budget or a demand-side resource budget. But in doing so, utilities must avoid duplicating the accounting of these expenditures through a clear delineation of expenditures.

Going forward, the scope of the TE Budget should be limited to an electric company's activities that support the adoption of electricity as a motor fuel. Incremental expenditure on generation and distribution infrastructure to serve EV load will generally be covered in distribution system planning dockets. Staff notes that in this filing, the program and budget approvals behind the proposed tariff changes originated in the Clean Fuels Program, the Residential EV Charging Pilot, and the Smart Grid Testbed. This is an example of how TE planning can interact with demand-side resource policy.

#### *Stakeholder Feedback/Involvement*

PGE has coordinated extensively with the DRRC to develop and design Phase II demonstration projects, as the Company has since 2018, and per the Phase II Testbed Proposal approved in Order No. 21-444. Examples of this include marketing strategies, vendor partnerships, technology systems, and eligibility conditions.

#### Conclusion

Staff supports the proposed revisions to Schedule 13, removing Phase I activities and implementing the Smart Solar Study and the EV Charging Study. The revisions accurately represent the parameters of the demonstration projects already approved in the SGTB Phase II proposal. Staff notes that to satisfy the requirements of OAR 860-022-0025, PGE states the following regarding the filing: The changes do not increase, decrease, otherwise change existing rates, or impact revenues.

#### **PROPOSED COMMISSION MOTION:**

Approve Portland General Electric's (Company or PGE) Advice No. 22-24.



## PGE Residential EV Charging Pilot Program

### Smart Charging Program

Incentives:  
\$25 Seasonally (up to twice per Year)

#### Level 2 EVSE purchase Rebate

Incentives:  
\$500 or  
\$1000 (Income eligible)

#### Bring Your Own Charger Rebate

Incentives:  
\$50 (one time)

Communication via L2 EVSE

#### evPulse

Incentives:  
\$50 (one time)

#### EV Charging Study

Incentives:  
\$20 per month

Communication via Telematics  
(Tesla)

Schedule  
8

Schedule  
13

The EV Charging Study incentives layer upon the existing Smart Charging Program incentives and will be available to qualifying evPulse customers located within the demonstration boundary.

EV Charging Study participants can qualify for a maximum incentive of \$630:

- 4x \$25 seasonal Smart Charging Program incentive (twice per year)
- 1x \$50 evPulse enrollment incentive
- 24x \$20 monthly EV Charging Study incentive

**PORTLAND GENERAL ELECTRIC COMPANY  
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RATE SCHEDULES**

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(C)

**SCHEDULE 13  
SMART GRID TESTBED PILOT**

(C)

**PURPOSE**

The Smart Grid Testbed Pilot (SGTB) is a first-of-its-kind research project meant to advance Portland General Electric's (PGE) collective understanding and development of demand response (DR) to gain insight into how PGE could provide a demand-side resource at scale in lieu of traditional supply-side resources. The second phase (Phase II) of the SGTB seeks to expand upon the research and planning conducted in Phase I, which concluded on December 31, 2022, to increase PGE's understanding of how customers perceive and value DR so that PGE may more effectively engage customers in flexible load efforts. All Phase I activities concluded December 31, 2022.

(C)

To achieve these goals, PGE is piloting both the Test Bed Smart Solar Study (Smart Solar Study) and Test Bed EV Charging Study (EV Charging Study) demonstration projects.

(C)

(D)

(N)

Smart Solar Study: PGE will leverage customer owned "smart inverters" (those equipped with the IEEE 1547-2018 Standard) to assess the value of inverter-based controls to deliver distribution operations value (e.g., Volt/VAR support); address hosting capacity issues; and support orchestration of Distributed Energy Resources (DER) together with distributed solar and storage to minimize grid export. PGE will recruit customers with qualifying equipment by offering an upfront incentive in addition to an ongoing monthly incentive for continued enrollment throughout the project duration (January 2023 – December 2024).

EV Charging Study: PGE will communicate with qualifying customer-owned electric vehicles (EV) to control the time of EV charging, while ensuring that the vehicles meet the operational needs of participants, and will evaluate customer acceptance of charge rate, charge time and Location-based Price Signals. Research in this project area will focus on improving understanding of the technical paths for charge management, costs, performance, and limitations. Customers within the EV Charging Study test bed with qualifying electric vehicles will opt in to receive an ongoing monthly incentive throughout the project duration (January 2023 – December 2024).

(N)

**DEFINITIONS**

IEEE 1547-2018 Standard – The standard that establishes the criteria and requirements for interconnection of distributed energy resources with electric power systems and associated interfaces.

(N)(D)

Electric Vehicle Service Equipment (EVSE) - The device, including the cable(s), coupler(s), and embedded software, installed for the purpose of transferring alternating current electricity at 208 or 240 volts between the electrical infrastructure and the EV.

(N)(D)

**SCHEDULE 13 (Continued)**

DEFINITIONS (Continued)

Location-based Price Signals – The notification that a specific utility rate is being offered to a customer determined by their location an eligible territory, allowing the utility to drive customer participation to achieve specific load shifting or load reduction goals of the area or feeder.

(N)(D)  
| |  
(N)(D)

**AVAILABLE**

Each demonstration area will have a different and distinct project boundary based on research conducted in Phase I. PGE customers may be eligible to enroll in the SGTB demonstration projects if located within a testbed’s geographic region as defined on PGE’s Smart Grid Test Bed webpage.

(N)

Each SGTB Phase II demonstration project will have different and distinct applicability as is defined on PGE’s Smart Grid Test Bed webpage. An overview of the customers eligible for the demonstration projects is as follows:

Smart Solar Study: Eligible Schedule 7 and Schedule 32 customers with interconnected photovoltaic (PV) systems behind the meter with qualifying smart inverters as defined on the SGTB webpage may elect to enroll in the project.

EV Charging Study: Eligible Schedule 7 customers with a qualifying EV as defined on the SGTB webpage and a Level 2 EVSE may elect to enroll in the project.

(N)  
(D)  
(N)

**ENROLLMENT**

Qualifying customers can enroll in the Smart Solar Study and EV Charging Study demonstration projects through the Smart Grid Test Bed webpage until December 31, 2024. Unless PGE terminates these demonstration projects, customers will remain enrolled for the entire project term. Each demonstration project within the SGTB Phase II will be subject to its own enrollment cap of a maximum of 500 participants for the Smart Solar Study and a maximum of 500 participants for the EV Charging Study.

(N)  
(D)  
(N)

**INCENTIVES**

Customers participating in a demonstration project within the SGTB will continue to pay all fees and charges associated with their currently enrolled rate schedule. Customers can qualify for the following incentives based on the demonstration project(s) enrolled:

(N)

**SCHEDULE 13 (Concluded)**

INCENTIVES (Continued)

Smart Solar Study

Eligible participants will receive a \$250 incentive paid at time of enrollment and will receive an additional ongoing incentive of \$10 per month while enrolled. The monthly incentive will begin at the month of enrollment after the tariff effective date and will continue through the end of the demonstration period (December 2024) unless the customer chooses to unenroll.

To remain enrolled in the project and to continue to receive monthly incentives, the customer must maintain the connection of their smart inverter to their WiFi network and must continue to allow PGE to communicate with their system via the manufacturer's interface.

EV Charging Study

Eligible participants will receive an incentive of \$20 per month while enrolled. The monthly incentive will begin at the month of enrollment after the tariff effective date and will continue through the end of the demonstration period (December 2024) unless the customer chooses to unenroll. Customers must first enroll in Schedule 8 and remain enrolled in the EV Charging Study demonstration to continue to receive monthly incentives.

**SPECIAL CONDITIONS**

1. The Customer may unenroll from the Smart Grid Test Bed demonstrations at any time. If a Customer unenrolls, the Customer is not eligible to re-enroll during the pilot period.
2. At any time, PGE can interact with customer-owned equipment with intention to remotely adjust the device settings in accordance with project goals.
3. The participant will retain ownership of the PV system equipment and is responsible for all maintenance, replacement, and disposal costs.
4. Customers already enrolled in the Solar Payment Option are not eligible for the Smart Solar Study demonstration.
5. Incentives may be provided in an on-bill credit on the Customer's next monthly billing statement or by check issued by Energy Trust of Oregon.
6. PGE is not responsible for any direct, consequential, incidental, punitive, exemplary, or indirect damages to the participating Customer or third parties that result from performing direct load control on a participating appliance.
7. PGE shall have the right to select the schedule and the percentage of the Customer's appliance(s) to cycle at any one time, up to 100%, at its sole discretion.
8. PGE will defer and seek recovery of all pilot costs not otherwise included in customer prices.

**TERM**

Phase II of the Smart Grid Test Bed concludes on December 31<sup>st</sup>, 2027. The Smart Solar Study and EV Charging Study pilots will conclude on December 31<sup>st</sup>, 2024.

(T)

(N)

(D)

(N)

(C)(M)

(C)(M)(D)