



**Portland General Electric**  
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October 18, 2022

Public Utility Commission of Oregon  
Attn: Filing Center  
201 High Street S.E., Suite 100  
P.O. Box 1088  
Salem, OR 97308-1088

**RE: Advice No. 22-24, Schedule 13 Smart Grid Testbed Pilot Update**

Portland General Electric Company (PGE) submits this filing pursuant to Oregon Revised Statutes 757.205 and 757.210, and Oregon Administrative Rule 860-022-0025, for filing proposed tariff sheets associated with Tariff P.U.C. No. 18, with a requested effective date of **January 1, 2023**:

Thirty Fourth Revision of Sheet No. 1-1  
Third Revision of Sheet No. 13-1  
Third Revision of Sheet No. 13-2  
First Revision of Sheet No. 13-3

PGE is withdrawing from the E-18 Tariff the Second Revision of Sheet No. 13-4 due to pagination.

PGE seeks to revise Schedule 13 Smart Grid Testbed Pilot to begin the first two Phase II activities. As Phase I activities have concluded and customers have been notified, this revision also removes all Phase I activities as they have ended.

With this filing, PGE is introducing the first two Phase II testbed activities: (1) Test Bed EV Charging Study, and (2) Test Bed Smart Solar Study.

The Test Bed EV Charging Study is intended to be complimentary to the existing evPulse pilot in Schedule 8 and will allow PGE to leverage vehicle telematics to further study customer electric vehicle charging behaviors and their impacts to the distribution grid. The Test Bed EV Charging Study is available to customers located within the designated study boundary who also qualify for the evPulse pilot. The additional \$20 per month incentive was determined reasonable to encourage customer enrollment and is deemed sufficient to keep customers enrolled through the duration of the study. Attachment A contains a flow chart of the various incentive pathways available under the PGE Residential EV Charging Pilot Program and demonstrates how the Test Bed EV Charging Study layers onto the existing evPulse pilot.

The Test Bed Smart Solar Study will allow PGE to study the value of leveraging inverter-based controls (UL 1741-SA/SB and IEEE 1547 2003/2018) on customer owned smart inverters to deliver distribution operations value (e.g., Volt/VAr support); address hosting capacity issues; and to modulate the proliferation of distributed energy resources within PGE's service territory both as a demand response resource for generation and distribution-level load balancing.

Customers will be incentivized to allow PGE to adjust the settings profiles applied to their inverters via collaboration with the inverter manufacturers. The customer incentives of \$250 for enrollment and an ongoing \$10 per month for continued participation were determined via a feedback forum conducted in Phase I by Energy Trust of Oregon where solar installer participants relayed the perception that a substantial upfront incentive would be required to entice customer enrollment, along with an ongoing monthly incentive to ensure participants remain enrolled

Phase I of the testbed was successful and PGE hopes to continue that success with Phase II activities.

A courtesy redline of Schedule 13 is attached.

To satisfy the requirements of OAR 860-022-0025, PGE responds as follows:

The changes do not increase, decrease, otherwise change existing rates, or impact revenues.

Please direct questions or comments regarding this filing to Casey Manley at (503) 464-8258. Please direct all formal correspondence and requests to the following email address [pge.opuc.filings@pgn.com](mailto:pge.opuc.filings@pgn.com)

Sincerely,

*\s\ Robert Macfarlane*

Robert Macfarlane  
Manager, Pricing and Tariffs

Enclosures

**PORTLAND GENERAL ELECTRIC COMPANY  
TABLE OF CONTENTS  
RATE SCHEDULES**

**Schedule    Description**

Table of Contents, Rate Schedules

Table of Contents, Rules and Regulations

**Residential Service**

4 Multifamily Residential Demand Response Water Heater Pilot

5 Residential Direct Load Control Pilot

7 Residential Service

8 Residential Electric Vehicle Charging Pilot

13 Smart Grid Testbed Pilot

14 Residential Battery Energy Storage Pilot

(C)

**Standard Service Schedules**

15 Outdoor Area Lighting Standard Service (Cost of Service)

17 Community Solar - Optional

18 Income-Qualified Bill Discount - Optional

25 Nonresidential Direct Load Control Pilot

26 Nonresidential Demand Response Program

32 Small Nonresidential Standard Service

38 Large Nonresidential Optional Time-of-Day Standard Service (Cost of Service)

47 Small Nonresidential Irrigation and Drainage Pumping Standard Service  
(Cost of Service)

49 Large Nonresidential Irrigation and Drainage Pumping Standard Service  
(Cost of Service)

50 Retail Electric Vehicle (EV) Charging

52 Nonresidential Electric Vehicle Charging Rebate Pilot

53 Nonresidential Heavy-Duty Electric Vehicle Charging

55 Large Nonresidential Green Energy Affinity Rider (GEAR)

56 Fleet Electrification Make-Ready Pilot

75 Partial Requirements Service

76R Partial Requirements Economic Replacement Power Rider

**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)

PGE Advice No. 22-24

Schedule 13  
Residential Testbed Pilot Update

Courtesy Redline

**SCHEDULE 13**  
**SMART GRID TESTBED RESIDENTIAL TESTBED PILOT**

**PURPOSE**

The Smart Grid Testbed Pilot (SGTB) is a first-of-its-kind research project meant to advance Portland General Electric's (PGE) PGE's 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. Eligible customers are those in the geographical area defined by the SGTB boundary located on PGE's webpage regarding the "Smart Grid Testbed". The second phase (Phase II) of the SGTB seeks to expand upon the research Testbed Pilot will achieve these goals through marketing and planning conducted in Phase I, which concluded on December 31, 2022, to increase PGE's understanding of how customers perceive communications activities, an opt-out demand response program, and value DR so optional activities that seek to demonstrate ways that PGE may more effectively engage work with customers into perform flexible load efforts. All Phase I activities concluded December 31, 2022 services.

All eligible Testbed participants will be enrolled in an opt-out peak time rebate (PTR) in which customers may receive a rebate when they respond to PGE's notification of peak time events. Additional Optional Activities offered to Testbed participants presently include, water heater direct load control for flexible grid services and ductless heat pump controls for demand response. Additional offerings will require modification of this schedule.

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.

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).

**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.

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.



~~Direct Load Control (DLC)—A remotely controllable technology that allows the utility to modify appliance energy usage for the purposes of demand response and other flexible load services.~~

~~Direct Load Control Event—A period in which the Company will provide direct load control.~~

~~Event Notification—The Company may issue a notification of a PTR or DLC event to participating Customers. Participating Customers must choose at least one method for receipt of notification. Notification methods may include email, text, auto-dialer phone call, on thermostat display screen, or via mobile app notification. Notification may also be available on the Company's website. Prior event notification is not required for all optional activities.~~

~~Holiday—The following are holidays for purposes of the program: New Year's Day (January 1), Memorial Day (last Monday in May), Independence Day (July 4), Labor Day (first Monday in September), Thanksgiving Day (fourth Thursday in November), and Christmas Day (December 25). If a holiday falls on a Saturday, the preceding Friday will be designated the holiday. If a holiday falls on a Sunday, the following Monday will be designated the holiday.~~

~~Optional Activities—Flexible load services demonstrations, research projects, or other activities governed under this tariff.~~

~~Peak Time Rebate (PTR) Program—customers choosing the PTR program are eligible to receive a rebate by reducing Energy use during Company called events, relative to each Customer's baseline Energy use, as determined by the Company.~~

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**Advice No. 22-24**  
**Issued October 18, 2022**  
**Brett Sims, Vice President**

**Effective for service**  
**on and after January 1, 2023**

## 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.

Water Heater Direct Load Control Demonstration— Optional activity whereby customers with qualifying water heaters may opt to allow PGE to perform direct load control on the water heater. Customers will receive the credits outlined below for reduced water heater energy use during a DLC event. PGE may also provide enrollment incentives up to \$50 per customer at the company's sole discretion. Qualifying water heaters are those that PGE is able to direct load control through onboard WiFi or a native CTA 2045 port.

Ductless Heat Pump Control Demonstration— Optional activity whereby customers with a ductless heat pump are eligible to receive a smart thermostat control at no cost, as well as the credits outlined below for reduced DHP energy use during a DLC event. PGE may also provide enrollment incentives up to \$50 per customer at the company's sole discretion.

### AVAILABLE

To Residential Customers within the PGE testbed geographic region, as defined on PGE's webpage regarding the "Smart Grid Testbed".

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.

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.

### APPLICABLE

Eligible Residential (Schedule 7) Customers are automatically enrolled in the PTR portion of the Pilot, as described in the Enrollment section of this tariff. Customers within the geographic boundary of the Testbed may elect to participate in any Optional Activities for which they may have a qualified appliance or are otherwise qualified. Customers will remain on Schedule 7 and will be eligible for the incentive described in this schedule. Eligible Customers must have a Network Meter. See the Special Conditions section for additional eligibility criteria.

### 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.

### **INCENTIVES CHARGES AND CREDITS**

Customers participating in a demonstration project within the SGTB~~this Pilot~~ will continue to pay all fees and charges associated with their currently enrolled rate schedule. Customers can qualify for in Schedule 7.

~~Participants in PTR and/or an Optional Activity will receive the following~~ incentives based on the demonstration project(s) enrolled~~credit for reducing Energy Usage during a PTR or DLC Event:~~

~~Credit 100.00~~ ¢ per kWh

~~To receive the Credit, the PTR Participant must reduce the home's overall energy use relative to the Customer's baseline energy use during a PTR event. The Optional Activity Participant's appliance must respond to the DLC event and reduce load during the DLC event to receive the credit.~~

~~Credits may be calculated based on actual savings or estimated based on engineering estimates.~~

~~Events will not be called on Holidays or weekends.~~

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**Advice No. 22-24**  
**Issued October 18, 2022**  
**Brett Sims, Vice President**

**Effective for service**  
**on and after January 1, 2023**

## SCHEDULE 13 (Concluded~~tinued~~)

### ~~PEAK TIME REBATE (PTR) EVENT~~

~~The PTR program has two event seasons: summer (the successive calendar months of June through September) and winter (successive calendar months of November through February). PGE will not call PTR events on weekends or Holidays. The Company will call PTR events only in event seasons. Prior to each season, the Company will remind the enrolled Customers that they are on the program, that they may participate in PTR events, and ways to be successful.~~

~~The Company initiates PTR events with an event notification to participating Customers the day prior to the PTR event. Participating Customers must choose at least one method for receipt of notification: email, text, or another available option. The Company will not call PTR events for more than two consecutive days. Reasons for calling events may include but are not limited to: Energy load forecasted to be in the top 1% of annual load hours, forecasted temperature above 90 or below 32, expected high generation heat rates and market power prices, and/or forecasted low or transitioning wind generation.~~

### ~~DIRECT LOAD CONTROL EVENT~~

~~Direct Load Control Events occur in 5 minute increments during an event period between one hour to five hours. The Company may call multiple events per day but will not exceed five cumulative hours for the day. During Direct Load Control Events the Customer may allow the Company to control their enrolled appliance for the duration of the event. The Customer has the option not to participate in each event by opting out. The Company may initiate Direct Load Control Events with Event notification prior to the event, but Event notification is not required.~~

### ~~PTR ENROLLMENT~~

~~Eligible Customers within the PGE testbed geographic region will be automatically enrolled in PTR. Customers will be notified of the program, their enrollment and option to unenroll, by mail or email. In the program notification, PGE will also advise Customers how to be successful on the Pilot. The Customers will be enrolled prior to the term of the Pilot; eligible customers starting new service in the Testbed will be enrolled shortly after the start of service. Unless this Pilot is otherwise terminated, participating Customers will be enrolled for the entire pilot term.~~

### ~~OPTIONAL ACTIVITIES ENROLLMENT~~

~~Eligible Customers those within the Testbed geographic region and with a qualified appliance or who are otherwise qualified have the option to enroll in additional demonstration or research projects. PGE will attempt to identify customers with qualified appliances or who are otherwise qualified to make them aware of the program. Customers may unenroll from the program at any time.~~

### 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. PTR at the next regularly scheduled meter reading. If a Customer unenrolls ~~from PTR~~, 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.
- 2.4. ~~Customers already enrolled in thea demand response offering are not eligible to participate in PTR. This includes, Schedule 4, Schedule 5, Time of Use under Schedule 7, Schedule 215, Schedule 216, Schedule 217, and the DLC option of this tariff. In addition, Solar Payment Option or Schedule 203 Net Metering Service are not eligible for the Smart Solar Study demonstration. this Pilot.~~
- 3.5. ~~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. at the next billing statement after the event season ends.~~
- 4.6. ~~PGEThe Company~~ 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.
- 5.7. ~~PGEThe Company~~ 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.
6. ~~Customers with interconnected energy storage are only eligible for PTR if the energy storage system is controlled by the Company and not the Customer.~~
- 7.8. ~~PGEThe Company~~ 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.

~~This Pilot concludes December 31, 2022.~~

PGE Advice No. 22-24

Schedule 13  
Residential Testbed Pilot Update

Attachment A

