



Oregon

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November 16, 2023



BY EMAIL

Portland General Electric Company

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RE: Advice No. 23-17

At the public meeting on November 16, 2023, the Commission adopted Staff's recommendation in this matter docketed as ADV 1542. 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 16, 2023**

REGULAR _____ **CONSENT** X **EFFECTIVE DATE** _____ November 17, 2023

DATE: November 6, 2023

TO: Public Utility Commission

FROM: Peter Kernan

THROUGH: JP Batmale and Sarah Hall **SIGNED**

SUBJECT: PORTLAND GENERAL ELECTRIC:
(Docket No. ADV 1542/Advice No. 23-17)
Revises Schedule 13 for implementation of Flexible Feeder and
Multifamily Bundle demonstrations in Smart Grid Testbed.

STAFF RECOMMENDATION:

Approve Portland General Electric's (Company or PGE) Advice No. 23-17.

DISCUSSION:

Issue

Whether the Oregon Public Utility Commission (Commission) should authorize the revision of Schedule 13 for implementation of Flexible Feeder and Multifamily Bundle demonstrations in the Smart Grid Testbed.

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.¹

Analysis

Background

On October 1, 2021, PGE filed its Smart Grid Testbed (Testbed) Phase II Proposal and presented six new demonstration projects as part of a five-year \$11 million effort.² The Commission approved Phase II on November 30, 2021.³ In this filing, PGE proposes to amend Schedule 13 with implementation-level details to launch two of the six previously approved Phase II demonstration projects, the Flexible Feeder and Multifamily Bundle. The Commission approved the Multifamily Bundle project plan on July 13, 2023⁴ and the Flexible Feeder project plan on October 16, 2023.⁵ The scope of both remains largely unchanged. However, at this time PGE is not implementing the Multifamily Retrofit project, one of two projects approved within the Multifamily Bundle. This filing is consistent with Staff's expectations of updating Schedule 13 after review of project plans in Docket No. UM 1976.⁶

¹ See Docket No. LC 66, Order No. 17-386,

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

² 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>.

³ See Docket No. UM 1976, Order No. 21-444,

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

⁴ See Docket No. UM 1976, Order No. 23-258, (Jul. 13, 2023),

<https://edocs.puc.state.or.us/efdocs/HAU/um1976hau165652.pdf>.

⁵ See Docket No. UM 1976, Order No. 23-376, (Oct. 20, 2023),

<https://apps.puc.state.or.us/orders/2023ords/23-376.pdf>.

⁶ See Docket No. UM 1976, Staff Report, page 10,

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

As context, in 2018 PGE formed the DRRC, a group of regional demand response experts, in accordance with Order No. 17-386.⁷ The Company engaged the group in development of a Testbed proposal, which the Company filed with the Commission in October 2018.⁸ On April 9, 2019, the Commission approved a new Schedule 13 that launched the Testbed.⁹ The Testbed was initially 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.

PGE and the DRRC designed the Testbed with two phases. In Phase I, PGE automatically enrolled residential customers within the Testbed geography in the Peak Time Rebates pilot. These customers received a pay-for-performance incentive when they voluntarily reduced load in response to a day-ahead notice from PGE. The Phase I design recognized that acquiring demand response resources requires not just one-time customer acquisition, but ongoing customer engagement and motivation to ensure participation. Phase I ended after 2021 and received its final evaluation in March 2022.

The Commission approved Phase II of the Testbed, which included six demonstration projects, in December 2021 with Order No. 21-444.¹⁰ The Phase II focus shifted to integrating customer-sited technologies into the Company's grid operations as a grid resource. Accordingly, the scope transitioned to testing discrete technology applications and outreach approaches. PGE removed the geographic constraints for some Phase II demonstration projects because the narrow geography limited the ability to target certain learning objectives.

Testbed Phase II project plan approval and implementation has operated in a two-step process. Staff first reviews detailed project plans and budgets, and the Commission considers approval in Docket No. UM 1976. Once PGE is prepared to implement the demonstration with customers, the Company submits an advice filing to amend

⁷ 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.

⁸ See, Docket No. ADV 859, Initial Utility Filing, Attachment A (Oct. 26, 2018) [https://edocs.puc.state.or.us/efdocs/UAA/uaa173123.pdf](https://edocs.puc.state.or.us/efddocs/UAA/uaa173123.pdf).

⁹ See *generally*, Docket No. ADV 859, New Schedule 13.

¹⁰ See, Docket No. UM 1976, Order No. 21-444, *Approval of Proposal for Phase II Smart Grid Test Bed* (Dec. 2, 2021) <https://apps.puc.state.or.us/orders/2021ords/21-444.pdf>.

Schedule 13 accordingly.¹¹ Table 1, found later in the memo, outlines the status of each demonstration along the two-step process.

Summary of Proposed Changes

1. Implement the Flexible Feeder Demonstration

PGE's Flexible Feeder demonstration seeks to build a 1.4 MW flexible load resource in a 2.5 square mile study area of North Portland. The Company anticipates this resource will require participation of roughly 20 percent of the area's 2,800 buildings. The research objective is to demonstrate and document the value of multiple types of distributed energy resources (DERs) and energy efficiency densely located and co deployed as grid assets.

The Commission approved key elements of the Flexible Feeder demonstration with Order 23-376.¹² The two and a half year effort will aim for DER adoption and enrollment at 580 buildings with flexible loads including solar smart inverters, battery energy storage, electric vehicle charging, smart thermostats, and smart water heaters. The project has a 10 percent energy efficiency goal across treated sites and aims to achieve the target via incentives for weatherization and efficient versions of connected devices such as heat pump water heaters and heat pumps for space conditioning.

The demonstration has a \$4,272,550 budget which covers PGE project coordinator staff, customer incentives, customer outreach and engagement, demand response software and controls, technical support, and a third-party evaluation contract. PGE and co-applicants Energy Trust of Oregon (Energy Trust), Community Energy Project (CEP), Northwest Energy Efficiency Alliance (NEEA), and the National Renewable Energy Lab (NREL) won a competitive \$6.65 Million Department of Energy (DOE) "Connected Communities" grant for the SmartGrid Advanced Load Management & Optimized Neighborhood (SALMON) project which provides significant funding leverage and increases the research scope of the Flexible Feeder.

In this filing, the Company introduces the following new elements:

- The Flexible Feeder will conclude on August 31, 2026.
- PGE Schedule 5, 8, 14, and 25 customers may be eligible to enroll if located within the project boundary found on the Testbed webpage.

¹¹ See e.g., 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* (Nov. 29, 2022) <https://edocs.puc.state.or.us/efdocs/UBF/adv1437ubf124252.pdf>.

¹² See for further detail Docket No. UM 1976, Order No. 23-376, (Oct. 20, 2023), <https://apps.puc.state.or.us/orders/2023ords/23-376.pdf>.

- Customers who wish to enroll in Schedule 13 to participate in the Flexible Feeder demonstration will remain on the underlying tariff and automatically revert upon closure of the Flexible Feeder demonstration.
- PGE provided Attachment A which details the go-to-market Flexible Feeder energy efficiency incentives and flexible load enrollment plus monthly participation incentives.¹³ Schedule 13 flexible load incentives are additional to those available on the underlying tariffs.

Unlike the underlying tariffs, Schedule 13 enrollment gives PGE the ability to schedule events at any time and outside programmatic seasons. This provides PGE the flexibility to test different flexible load use cases. In conversations with PGE, Staff notes that customers retain the ability to opt out of events, receive advanced notice about events, and benefit from increased enrollment and participation incentives.

The incentive levels for the Flexible Feeder demonstration are not codified within Schedule 13. This decision is intentional and consistent with Commission treatment of incentive levels for PacifiCorp's demand response programs¹⁴ and the spirit of the Testbed to learn quickly and test various approaches. Staff notes that PGE does not have plans to alter incentives. If the need arises to adjust incentives based on customer uptake, PGE discussed a process to review changes with the DRRC, notify enrolled customers, and make the changes publicly available on the website.

Staff supports the proposed Flexible Feeder demonstration as it implements the parameters of the detailed project plan already approved in the Testbed Phase II proposal.

2. *Implement the Multifamily New Construction Heat Pump Water Heater Systems demonstration within the Multifamily Bundle*

The Multifamily New Construction demonstration explores scaling flexible load hot water systems. A key project learning objective is to understand processes and behaviors of multifamily housing developers related to water heating equipment selection. PGE will also evaluate and characterize the performance of the CTA-2045 communications technology for calling flexible load events in new multifamily buildings. PGE experienced connectivity issues with water heaters connected to Wi-Fi and to a lesser extent, cellular networks. CTA-2045 is anticipated to resolve these performance challenges.

¹³ Docket No. ADV 1542. *Advice No. 23-17, Schedule 13 Smart Grid Testbed Pilot Update*, Attachment A, (Oct. 12, 2023), <https://edocs.puc.state.or.us/efdocs/UAA/uaa17650.pdf>.

¹⁴ See Docket No. ADV 1383. Staff report, p. 4-5, (Apr. 25, 2022), <https://edocs.puc.state.or.us/efdocs/HAU/adv1383hau165518.pdf>.

Key elements of the Multifamily Bundle from the Testbed Phase II Proposal were previously approved with Order No. 23-258.¹⁵ Through the three-year effort PGE will explore scaling flexible load hot water systems in multifamily, new construction projects. PGE will study a central heat pump water heater (HPWH) serving an entire low- to moderate-income multifamily housing project and unitary HPWHs serving individual units within a market-rate multifamily new construction project. Between the central and unitary projects, PGE expects participation of over 100 multifamily units. PGE will use universal control module devices connected to CTA-2045 ports to control participating HPWHs.

The Multifamily New Construction HPWH has a budget of \$750,000 split between a central system HPWH study and a unitary HPWH systems study, \$385,000 and \$365,000 respectively. The budget covers: PGE incremental staffing; subcontracting to the Northwest Energy Efficiency Alliance; equipment, software, and controls; customer incentives; third party engineering support; and a third party evaluation, report, and consulting support.

In this filing, the Company introduces the following new elements:

- The Multifamily Bundle will run for two years, concluding on December 31, 2025.
- Schedule 13 enrollment eligibility is open to multifamily new construction projects that install qualifying HPWH equipment and where the accounts associated with water heating receive service under either Schedules 7 or 32, depending on how the building is metered.
- Participating multifamily new construction property owners are eligible for upfront incentives of \$1,800 per unitary HPWH and \$1,000 per unit served by a central HPWH. Property owners will sign a participation agreement with PGE.
- New HPWH equipment will be enrolled in PGE's Multifamily Residential Demand Response Water Heater Pilot, Schedule 4, to enable on-going participation incentives.

Staff notes that the Multifamily Bundle included a Multifamily Retrofit demonstration with an approved budget of \$500,000. In this filing, PGE determined the Multifamily Retrofit as proposed does not align well with the Testbed focus. The Company noted that adoption of flexible load-ready equipment is naturally occurring via building code requirements and thus PGE's intervention with incentives would not support further uptake. PGE aspires to use the technical learnings from the Multifamily New Construction HPWH demonstration to inform a relaunch of the Multifamily Water Heater

¹⁵ Docket No. UM 1976, *Smart Grid Testbed Phase II Proposal: Single Family and Multifamily Demonstration Supplement*, Appendices F and G, (May 17, 2023), <https://edocs.puc.state.or.us/efdocs/HAH/um1976hah92111.pdf>.

Pilot (Schedule 4). PGE did not propose alternative investments for the Multifamily Retrofit funding, instead stating an intent to develop and share next steps with the DRRC.

While Staff supports the role of the Testbed to be dynamic, Staff has concerns that discontinuing the Multifamily Retrofit project leaves certain learning objectives unanswered. In particular, the project was intended to drive learnings about working with existing affordable housing providers and how best to adopt and enroll efficient, connected flexible load devices during stock turnover. Though CTA-2045 is required on all new water heaters in Oregon, it is unclear that affordable housing will adopt more efficient HPWHs. The absence of a Multifamily Retrofit demonstration also leaves efficient, connected heating and cooling technologies untested in existing affordable multifamily buildings.

Staff remains highly supportive of improving equitable participation in PGE's flexible load programs and the resultant potential for energy burden reductions. Staff recommends PGE reach out to individual DRRC members in a proactive and consultative format, as opposed to PGE first developing a proposal and seeking feedback. Additionally, Staff recommends consulting affordable multifamily housing experts outside the DRRC. One of the fast-tracked investments from the Portland Clean Energy Community Benefits Fund (PCEF) is \$60 million for clean energy in regulated multifamily affordable housing.¹⁶ PCEF and collaborators may be additional experts to consult in PGE's reconsideration of a Multifamily Retrofit demonstration.

Staff supports the Schedule 13 implementation changes for the Multifamily New Construction HPWH demonstration as it implements the parameters of the detailed project plan already approved with Order No. 23-258.

Overall Testbed Status

Staff notes that PGE initially intended to bring forward implementation level details for the Single Family Bundle which was approved on July 13, 2023.¹⁷ PGE delays the inclusion of the Single Family Bundle, citing a need to conduct additional outreach and collaboration with potential building partners before finalizing an incentive package. Staff understands this delay and expects launch to occur early in 2024.

¹⁶ See *PCEF Climate Investment Plan*, p. 24, (Aug. 2023)
<https://www.portland.gov/bps/cleanenergy/climate-investment/documents/pcef-climate-investment-plan/download>.

¹⁷ See Docket No. UM 1976, Order No. 23-258, (Jul. 13, 2023),
<https://edocs.puc.state.or.us/efdocs/HAU/um1976hau165652.pdf>.

Table 1 summarizes the status of Testbed demonstrations. To date, PGE has not introduced detailed project plans for two demonstrations within the Testbed Phase II, the Vehicle-to-X (V2X) demonstration and the Commercial and Industrial, Municipal Flexible Load and Resiliency demonstration. Those two demonstrations plus the Single Family Bundle all require approval of Schedule 13 changes for implementation. Phase II of the Testbed concludes on December 31, 2027, so Staff anticipates additional 2024 filings to propose advancement of the outstanding three demonstrations via the review and approval process.

Table 1: Status of Testbed Demonstrations

Demonstrations			Detailed Project Plan	Schedule 13 Amendments
1	Flexible Feeder	Years 1-2	Submitted and Approved	N/A
		Years 3-5	Submitted and Approved	Submitted and Pending Approval
2	Managed EV Charging/V2X	Managed EV Charging	Submitted and Approved	Submitted and Approved
		V2X	Not Submitted	Not Submitted
3	Smart Solar		Submitted and Approved	Submitted and Approved
4	C&I, Municipal Flexible Load & Resiliency		Not Submitted	Not Submitted
5	Multifamily Bundle		Submitted and Approved	Submitted and Pending Approval
6	Single Family New Construction Bundle		Submitted and Approved	Not Submitted

Stakeholder Feedback/Involvement

PGE 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. PGE continued to provide updates on both the Flexible Feeder and Multifamily Bundle during quarterly DRRC meetings and invited questions and feedback. The DRRC reviewed and provided feedback on PGE’s proposed Flexible Feeder and Multifamily Bundle incentives in September.

Conclusion

Staff supports the proposed revisions to Schedule 13, implementing the Flexible Feeder and Multifamily Bundle demonstrations. The revisions accurately represent the

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Page 9

parameters of the demonstration projects already approved in project plans submitted as addenda to the Testbed Phase II proposal in Docket No. UM 1976. Staff notes that to satisfy the requirements of OAR 860-022-0025, PGE states that 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. 23-17.

CA1 Docket No. ADV 1542

**SCHEDULE 13
SMART GRID 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) 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.

To achieve these goals, PGE is piloting the Test Bed Smart Solar Study (Smart Solar Study), Test Bed EV Charging Study (EV Charging Study), Flexible Feeder, and Multi-Family Bundle demonstration projects.

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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 (DERs) 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).

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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).

Flexible Feeder Study: The flexible feeder study seeks to explore the potential benefit of a concentrated number of connected DERs providing support to the grid. PGE will provide incentives, in addition to those offered to customers when enrolling in the respective DER programs, to promote installation of flexible load enabling and enhancing technologies within the project area. Eligible DERs include qualifying smart thermostats, battery energy storage systems, smart inverters, smart water heaters, and electric vehicles. Enrollment in the flexible feeder study will end at the earlier of August 31, 2026, or when incentive funds are exhausted.

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SCHEDULE 13 (Continued)

PURPOSE (Continued)

Multi-Family Bundle: The Multi-Family Bundle will promote the installation of flexible load enabling and enhancing technologies in newly constructed Multi-Family Dwellings. PGE will provide equipment purchase incentives for qualifying heat pump water heater (HPWH) systems that are flex load enabled, which will be used to assess load flexibility potential, building construction and design considerations, system operation and maintenance, and occupant feedback. Incentives will be available through the end of the study in December 2025 or until incentive funds are exhausted.

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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.

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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.

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

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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.

Each SGTB Phase II demonstration project will have different and distinct applicability. Smart Solar and EV Charging applicability is defined on PGE’s Smart Grid Test Bed webpage. Flexible Feeder project applicability and incentives will be on a dedicated website available to eligible customers. For the Multi-Family Bundle, PGE will designate eligible building owners and their associated new construction projects. Interested building owners can request inclusion of eligible new construction projects in the Multi-Family Bundle by emailing smartgridtestbed@pgn.com. An overview of the customers eligible for the demonstration projects is as follows:

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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.

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SCHEDULE 13 (Continued)

AVAILABLE (Continued):

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.

Flexible Feeder Study: Eligible customers who install any of the following technologies: smart thermostats, battery energy storage systems, smart inverters, smart water heaters and electric vehicles or who are already enrolled in the Smart Solar, EV Charging, or Smart Battery Pilot and within the project boundary. Specific eligibility for each technology is dictated by Schedules 5, 8, 14, and 25.

Multi-Family Bundle: Multi-Family Dwelling new construction projects where the accounts associated with the water heaters will receive service under either Schedule 7 or 32, depending on how the building is metered. Multifamily new construction project property owners must commit to the installation of qualifying HPWH equipment.

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.

For the Flexible Feeder demonstration, enrollment in PGE's demand response programs for thermostats and battery energy storage systems governed by Schedules 5, 8, 14, and 25 is required as a precondition to enrollment in Flexible Feeder offers. Customers in the Flexible Feeder project area may also 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.

For the Multi-Family Bundle, PGE will work directly with multifamily new construction project property owners to participate. A signed participation agreement will be obtained for each participant group at the time of enrollment in the demonstration. Unless PGE terminates these demonstration projects, this participation agreement will indicate enrollment for the entire project term.

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:

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SCHEDULE 13 (Continued)

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.

Flexible Feeder Study

Eligible participants will receive a combination of incentives depending on the number of upgrades and flexible load capable equipment/upgrades installed. All incentive offers and eligibility terms will be published on PGE's Smart Grid Test Bed Collaboration website. Potential modifications to incentive offerings will be provided to the Demand Response Review Committee (DRRC) for review and feedback prior to rollout.

In all cases, the customer will be responsible for meeting eligibility criteria and maintaining good standing in the program as defined in applicable tariffs. PGE may call events outside of existing programmatic seasons and schedules. Additional monthly Flexible Feeder incentives will be available at the month of enrollment and will continue through the end of the demonstration period (August 31, 2026) unless the customer unenrolls.

Multifamily Bundle

Participating multifamily new construction project property owners will receive equipment purchase incentives of amounts up to \$1,800 per unitary HPWH system installed and up to \$1,000 per unit served by a central HPWH system. Installed HPWH equipment will subsequently be enrolled in PGE's Multifamily Residential Demand Response Water Heater Pilot (Schedule 4) once available to receive on-going participation incentives.

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SCHEDULE 13 (Concluded)

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 at PGE's discretion via an on-bill credit on the Customer's next monthly billing statement, direct deposit or check issued to participants by PGE, PGE's authorized consultants, or the 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, 2027. The Smart Solar Study and EV Charging Study pilots will conclude on December 31, 2024. The Multifamily Bundle will conclude December 31, 2025. The Flexible Feeder study will conclude on August 31, 2026.

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