

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

UM 1976

In the Matter of

PORTLAND GENERAL ELECTRIC
COMPANY,

Proposes a Vehicle-to-everything
Demonstration Project Plan and Budget
Within the Smart Grid Testbed.

ORDER

DISPOSITION: STAFF'S RECOMMENDATION ADOPTED

At its public meeting on May 16, 2024, the Public Utility Commission of Oregon adopted Staff's recommendation in this matter. The Staff Report with the recommendation is attached as Appendix A.

BY THE COMMISSION:



Nolan Moser

Chief Administrative Law Judge



A party may request rehearing or reconsideration of this order under ORS 756.561. A request for rehearing or reconsideration must be filed with the Commission within 60 days of the date of service of this order. The request must comply with the requirements in OAR 860-001-0720. A copy of the request must also be served on each party to the proceedings as provided in OAR 860-001-0180(2). A party may appeal this order by filing a petition for review with the Circuit Court for Marion County in compliance with ORS 183.484.

**PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: May 16, 2024**

REGULAR CONSENT EFFECTIVE DATE May 17, 2024

DATE: May 6, 2024

TO: Public Utility Commission

FROM: Peter Kernan

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

SUBJECT: PORTLAND GENERAL ELECTRIC:
(Docket No. UM 1976)
Proposes a vehicle-to-everything demonstration project plan and budget within the Smart Grid Testbed.

STAFF RECOMMENDATION:

Approve the Portland General Electric (PGE or Company) vehicle-to-everything demonstration project plan within the Smart Grid Testbed and approve the \$370,000 budget for the vehicle-to-everything demonstration.

DISCUSSION:

Issue

Whether to approve PGE's vehicle-to-everything demonstration project plan and budget within the Smart Grid Testbed.

Applicable Rule or Law

ORS 757.054 requires electric companies to plan for and pursue the acquisition of all available cost-effective demand response resources.

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.¹

¹ Docket No. LC 66, Order No. 17-386, *2016 IRP Acknowledged with Modifications and Exception*, p. 9 (issued Oct. 9, 2017), <https://apps.puc.state.or.us/orders/2017ords/17-386.pdf>.

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In Order No. 21-444, the Commission approved PGE's proposal for Phase II of the Smart Grid Test Bed.

Analysis

Background

In this filing, PGE provides a detailed project plan and proposes a \$370,000 budget for the vehicle-to-everything (V2X) demonstration. PGE introduced the demonstration in the Smart Grid Testbed (Testbed) Phase II Proposal in October 2021. As discussed further below, the detailed project plan signifies PGE's intent to transition the demonstration from planning to implementation.

As background, the Commission directed PGE to establish the Testbed in Order No. 17-386 (2017) and also directed PGE to convene a Demand Response Review Committee (DRRC) to provide guidance in developing the Testbed. PGE gathered a group of regional demand response experts in 2018 to form the DRRC and help in development of a Testbed proposal,² which the Commission approved on April 9, 2019.³ 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 flexible load 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, to better understand customer engagement and motivation. Phase I ended after 2021 and received its final evaluation in April 2022.⁴

The Commission approved Phase II of the Testbed, including six demonstration projects, in December 2021 with Order No. 21-444.⁵ The Phase II focus shifted to integrating customer-sited technologies into the Company's grid operations as a grid resource. PGE removed the geographic constraints for some Phase II demonstration

² 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.

³ See generally, Docket No. ADV 859, New Schedule 13.

⁴ See Docket No. UM 1976, *Final Evaluation of PGE's Demand Response Testbed Project*, (April 26, 2022), <https://edocs.puc.state.or.us/efdocs/HAD/um1976had9321.pdf>.

⁵ 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>.

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projects because the narrow geography limited the ability to target certain learning objectives.

Testbed Phase II project plan approval and implementation operates 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 Schedule 13 accordingly.⁶ Staff includes Appendix A indicating where each of the six demonstrations is along the two-step process.

Summary of Proposed Changes

1. Implement the V2X demonstration

The V2X demonstration goal is to determine the flexible load potential of managing electric vehicle (EV) charging where the vehicle has bi-directional charging capability. PGE seeks to enroll between 10 and 20 customers who already own or will acquire a Ford F-150 Lightning electric truck and install the requisite Ford Home Integration System and Ford Charge Station Pro.

PGE notes that while there are 365 Ford F-150 Lightnings registered in its service territory as of Q1 2024, there are only two known Home Integration Systems installed. PGE states this is due to the high cost of the equipment and installation, which sometimes exceeds \$10,000. Thus, PGE designed an incentive and outreach plan to encourage existing or new owners to install the Home Integration System.

PGE proposes to offer a \$2,500 equipment incentive to any PGE customer, and a \$5,000 incentive to customers located in a zip code typically associated with Public Safety Power Shutoff (PSPS) vulnerability.⁷ PGE intends the higher incentive to encourage adoption in areas that the Company qualifies as the “edge of our distribution system” and to provide additional resiliency against outages. These upfront incentives will be paid directly to the installation contractor to offset equipment and installation costs.

PGE also proposes two forms of ongoing incentives. First, a monthly participation incentive of \$50 will compensate customers for general participation with the various

⁶ 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>.

⁷ Staff notes that PSPS zones change based on real-world conditions and are posted online at the following link: <https://portlandgeneral.com/outages-safety/public-safety-power-shutoffs>.

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use cases PGE plans to test. Second, customers will receive \$1.70/kWh for energy dispatched from the vehicle during Peak Time Events, which is equivalent to the compensation offered to participants of PGE's Smart Battery Pilot.

PGE plans to utilize the bi-directional charging capability to test four use cases:

1. **Peak Time Avoidance:** Vehicle does not charge during mid- or on-peak times.
2. **Peak Demand Load Reduction:** Vehicle dispatches power to the home during on-peak times (weekdays, 5:00 p.m.–9:00 p.m.).
3. **Peak Time Event Grid Export:** Vehicle to dispatch up to maximum 9.6 kW to both home and grid during Peak Time Events.
4. **Pre-Charge Response to PGE Alert:** Upon PGE alert, vehicle will be charged to maximum state of charge during off-peak times.

During enrollment, all participating customers will be enrolled in the Time of Day tariff to generate learnings about the ability to optimize participants' savings by using a vehicle to power their home during on-peak times. Consistent with other flexible load pilots and programs, customers ultimately maintain the ability to override the utility-imposed controls. Additionally, a vehicle has different considerations from stationary storage. First, the battery is generally larger than stationary storage systems. Second, the vehicle is relied upon for transportation, so customers will elect a minimum state of charge beyond which PGE cannot utilize additional battery capacity.

PGE outlines the following learning objectives in its project plan:

- Customer appetite for leveraging their electric vehicles to reduce kWh consumption during peak times to impart on-bill savings,
- The technical requirements of installing a bi-directional charger and how to review and approve their installation within PGE's interconnections team,
- The data sharing requirements of an electric vehicle manufacturer to have visibility into participant vehicle discharge and the associated impact on the home/grid,
- The requisite communications channels between PGE and the EV manufacturer, PGE and the participating customers, and the electric vehicle manufacturer and the participating customers,
- What forms of incentives (up-front, ongoing, non-monetary, etc.) are most impactful to achieving participant enrollments.

Staff supports the detailed project plan to move V2X toward implementation and recommends the Commission approve it.

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2. Approve a demonstration budget of \$370,000

In this filing, PGE requests approval of a \$370,000 budget to implement the V2X demonstration, including incremental PGE staffing, equipment and ongoing incentives, recruitment and outreach, equipment and research, and a third-party evaluation. The V2X demonstration is one component of the research area related to EV charging within the Testbed. As demonstrated in Table 1, PGE projected Managed EV Charging/V2X research would cost \$2,250,000 in the Testbed Phase II. To date, \$872,200 was previously approved to fund the Managed EV Charging component of the research area.

Table 1. Budget Overview for Phase II Demonstrations

Research Area	Expected Budget	Budget Requested to Date	Updated Request
Flexible Feeder	\$4,272,550 ⁸	\$4,272,550	No change
Managed EV Charging/V2X	\$2,250,000 ⁹	\$872,200	\$1,242,200
Solar Smart Inverters	\$1,000,000	\$1,000,000	No change
C&I, Municipal Flexible Load & Resiliency	\$1,727,450 ¹⁰	\$0	No change
Multifamily Bundle	\$1,250,000 ¹¹	\$1,250,000	No change
Single Family New Construction Bundle	\$500,000	\$500,000	No change
Total	\$11,000,000	\$7,894,750	\$8,264,750

Staff notes that the updated request for Managed EV Charging/V2X research is approximately \$1 million less than the expected budget, last revised in October 2023 with Order No. 23-376. In this filing, PGE acknowledged the difference and committed to exploring further research needs with the DRRC and Staff later this year. At this time, Staff is not aware of any pending research proposals and supports the lower-than-anticipated budget while maintaining meaningful learnings related to EV charging.

⁸ Budget reflects funds reallocated per Order 23-376.

⁹ Budget reflects funds reallocated per Order No. 23-258.

¹⁰ Budget reflects funds reallocated per Order 23-376.

¹¹ Budget reflects funds reallocated per Order No. 23-258.

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Additionally, PGE's initial V2X proposal that the Company shared with the DRRC and Staff in December 2023, included a \$500,000 budget. After discussion with the Company and further consideration, Staff informed PGE of its opposition to the initial draft filing. Notably, Staff found that individual incentives were too generous. Staff also opposed the Company's exclusive reliance on a soft-marketing approach to friends and family given the small number of participants necessary to complete the research. Staff found both components problematic, as the large incentive, which covered up to the entire incremental cost, could go directly to friends, family, and potentially employees of the Company.

PGE revised its initial proposal, developed additional marketing strategies, and reduced the incentive budget by \$130,000 without revising the scope of participants or learning objectives. The upfront incentives better reflect other pilot programs around the country. Further, PGE added a resiliency component by focusing new outreach and incentives to existing Ford F-150 Lightning owners in PSPS zones. Staff supports the additional learnings that could come from focusing on resiliency in PSPS regions and appreciates PGE's direct marketing to existing owners. With the resiliency inclusion and smaller budget, Staff recommends approval of the \$370,000 budget for the V2X demonstration.

Stakeholder Feedback and Involvement

For quarterly DRRC calls, PGE regularly prepares updates to marketing strategies, vendor partnerships, technology systems, eligibility conditions, and budget modifications related to all demonstrations. Regarding the V2X demonstration, PGE first proposed the project plan during the December 2023 DRRC meeting. Subsequently, the Company sought DRRC feedback to an early draft. DRRC members requested clarification to incentives, provided introductions to similar pilots at other utilities, and asked questions of how impacts would be evaluated. Overall, DRRC member supported the revised project plan proposal.

Conclusion

Staff supports and recommends approval of the project plan and budget to implement the V2X demonstration. Staff appreciates PGE's ongoing collaboration with the DRRC. This V2X demonstration shows continued PGE leadership to understand the capabilities of nascent technology before determining the impact and feasibility of scaling up offerings. Staff looks forward to continued collaboration and accelerated learning in the Testbed.

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PROPOSED COMMISSION MOTION:

Approve the Portland General Electric (PGE or Company) vehicle-to-everything demonstration project plan within the Smart Grid Testbed and approve the \$370,000 budget for the vehicle-to-everything demonstration.

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Appendix A: Testbed Demonstration Status

With this filing, PGE has submitted detailed project plans and budgets for five of the six Testbed Phase II demonstrations for Commission approval.¹² Four of six Testbed Phase II demonstrations have submitted an Advice filing to amend Schedule 13 to begin customer implementation. In November 2023, the Commission approved PGE's Advice No. 23-17 to revise Schedule 13 to implement the Flex Feeder and parts of the Multifamily Bundle demonstrations.¹³ Table 2 documents the status of each Testbed demonstration.

Table 2: Status of Testbed Demonstrations

Demonstrations		Detailed Project Plan	Schedule 13 Amendments
1	Flexible Feeder	Years 1-2	Submitted and Approved
		Years 3-5	Submitted and Approved
2	Managed EV Charging/V2X	Managed EV Charging	Submitted and Approved
		V2X	Submitted for Commission Consideration
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	Partial Submission and Approval of Parts
6	Single Family New Construction Bundle	Submitted and Approved	Not Submitted

¹² Order No. 21-444, note 5; Approving detailed project plans for Flexible Feeder years 1-2, Managed EV Charging, and Solar Smart Inverter; Docket No. UM 1976, Order No. 23-258, *Approval of detailed project plans for Multifamily Bundle and Single Family Bundle* (July 13, 2023), <https://apps.puc.state.or.us/orders/2023ords/23-258.pdf>.

¹³ See Docket No. ADV 1542, <https://apps.puc.state.or.us/edockets/DocketNoLayout.asp?DocketID=23889>.