

**PUBLIC UTILITY COMMISSION OF OREGON  
STAFF REPORT  
PUBLIC MEETING DATE: October 17, 2023**

**REGULAR** \_\_\_\_\_ **CONSENT**  X  **EFFECTIVE DATE**  October 18, 2023

**DATE:** October 9, 2023

**TO:** Public Utility Commission

**FROM:** Peter Kernan

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

**SUBJECT:** PORTLAND GENERAL ELECTRIC:  
(Docket No. UM 1976)  
Seeks approval of detailed plan and budget modifications for Years 3—5  
of Flexible Feeder demonstration within Smart Grid Testbed.

**STAFF RECOMMENDATION:**

Approve detailed plans for Years 3--5 of the Flexible Feeder demonstration.

**DISCUSSION:**

Issue

Whether the Public Utility Commission of Oregon (Commission) should approve Portland General Electric's (PGE or Company) detailed plans for the Flexible Feeder demonstration project previously introduced in Phase II of 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. The Commission also directed PGE to convene a Demand Response Review Committee (DRRC) to provide guidance in developing the Testbed.<sup>1</sup>

In Order No. 21-444 the Commission approved PGE's proposal for Phase II of the Smart Grid Test Bed, including years one and two of the Flexible Feeder Demonstration.

## Analysis

### *Background*

In this filing, PGE introduces a detailed project plan and budget for Years 3—5 of the Flexible Feeder demonstration. PGE introduced the Flexible Feeder project plan for Years 1—2 of budget and implementation planning in the Testbed Phase II Proposal. The Commission approved a \$985,000 budget and project plan for Years 1—2 with Order No. 21-444.<sup>2</sup> In this filing, PGE provides an updated project plan to move the Flexible Feeder from planning to implementation. The Company also proposes to reallocate some budget from the Flexible Feeder to the Municipal Flexible Load & Resiliency demonstration after identifying cost savings.

As context, in 2018 PGE formed the DRRC, a group of regional demand response experts, in accordance with Order No. 17-386.<sup>3</sup> The Company engaged the group in development of a Testbed proposal, which the Company filed with the Commission in October 2018.<sup>4</sup> On April 9, 2019, the Commission approved a new Schedule 13 that launched the Testbed.<sup>5</sup> 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

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<sup>1</sup> 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>.

<sup>2</sup> Order No. 21-444, note 5.

<sup>3</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>4</sup> See, Docket No. ADV 859, Initial Utility Filing, Attachment A (Oct. 26, 2018) <https://edocs.puc.state.or.us/efdocs/UAA/uaa173123.pdf>.

<sup>5</sup> See *generally*, Docket No. ADV 859, New Schedule 13.

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.<sup>6</sup> 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 Schedule 13 accordingly.<sup>7</sup> Staff includes Appendix A indicating where each of the six demonstrations is along the two-step process.

### *Summary of Proposed Changes*

#### *1. Reallocate approved budgets between demonstration projects*

PGE provides an update to its budget forecast and proposes to reallocate \$227,450 from the Flexible Feeder to the Commercial and Industrial (C&I), Municipal Flexible Load & Resiliency demonstration. The PGE team identified opportunities to implement the Flexible Feeder for less than the \$4.5 million budget approved in Order No. 21-444 and determined funds would be better allocated to the C&I demonstration. This proposed change has no impact on the Testbed Phase II budget of \$11 million.

In this filing, PGE requests Commission approval of an additional \$3,287,550 to implement Years 3–5 of the Flexible Feeder demonstration. Inclusive of the \$985,000 approved with Order No. 21-444, PGE requests a cumulative \$4,272,550 budget for the Flexible Feeder demonstration. As noted, this amount is lower than the \$4.5 million budget previously proposed.

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<sup>6</sup> 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>.

<sup>7</sup> 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>.

Inclusive of this filing, PGE has requested \$7.89 million of the total \$11 million budget across the five approved demonstrations. Table 1 summarizes the previously approved Phase II budget, the proposed budget revision in this filing, and the amount of total budget requested.

**Table 1. Budget Overview for Phase II Demonstrations**

Research Area	Approved Budget <sup>8</sup>	Proposed Budget Revision	Budget Requested to Date
Flexible Feeder	\$4,500,00	\$4,272,550	\$4,272,550*
Managed EV Charging/V2X	\$2,250,000	\$2,250,000	\$872,200
Solar Smart Inverters	\$1,000,000	\$1,000,000	\$1,000,000
C&I, Municipal Flexible Load & Resiliency	\$1,500,000	\$1,727,450	\$0
Multifamily Bundle	\$1,250,000	\$1,250,000	\$1,250,000
Single Family New Construction Bundle	\$500,000	\$500,000	\$500,000
<b>Total</b>	<b>\$11,000,000</b>	<b>\$11,000,000</b>	<b>\$7,894,750</b>

\*Represents \$985,000 approved in Order No. 21-444 plus \$3,287,550 additional requested in this filing.

Unrequested budget amounts remain in two demonstrations, Managed EV Charging/V2X and C&I, Municipal Flexible Load & Resiliency. PGE will continue to develop these projects and review them with the DRRC. Once fully developed, PGE will submit detailed project plans and an associated budget request in UM 1976.

Staff finds the budget modifications appropriate and resulting in no overall increase to the Phase II budget. Staff appreciates that PGE’s Testbed team anticipates lower overall budget needs for the Flexible Feeder and Managed EV Charging/V2X studies.<sup>9</sup>

## 2. Implement 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

<sup>8</sup> Order No. 23-258, note 7, The Approved Budget reflects the one approved by the Commission with Order No. 23-258. An earlier version was approved with Order No. 21-444.

<sup>9</sup> Order No. 23-258, note 7, The Commission approved shifting \$250,000 from Managed EV Charging/V2X to the Multifamily Bundle.

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.

Using the naming convention introduced in the Phase II Proposal, PGE details the Flexible Feeder Years 3–5 project plan as Appendix H.<sup>10</sup> Below, Staff reviews Flexible Feeder accomplishments in Years 1–2 and highlights project elements proposed for Years 3–5.

### **Flexible Feeder, Years 1–2**

The first two years of the Flexible Feeder project included successes and progress in demonstration development. Notably, 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 Department of Energy (DOE) “Connected Communities” grant for the SmartGrid Advanced Load Management & Optimized Neighborhood (SALMON) project. When the Flexible Feeder demonstration and the Testbed Phase II Proposal was written, SALMON had not yet been selected by DOE.

The \$6.65M DOE award will provide significant funding leverage and additional research to the Flexible Feeder. DOE’s funding helps cover staff time for all the co-applicant organizations and means that ratepayer dollars go further toward incentivizing equitable distribution of densely located energy efficiency and DERs. In Appendix H, PGE highlights some of the discrete activities that the DOE grant will support, including:

- An expanded customer engagement campaign co-managed by PGE and Energy Trust,
- Focused support and engagement of underserved communities with energy efficiency and demand response through partnership with CEP,
- Analysis of the value of distributed solar with smart inverters, storage, and managed charging, which will be tested in separate Phase II demonstrations,
- Enhanced technical assistance on distribution system modeling and distributed energy resources management system (DERMS) integration/operation, and
- Engagement of regional stakeholders to support understanding and adoption of project learnings.

In the past two years, the Flexible Feeder team actively completed project planning activities including residential and commercial market assessments, distributed energy

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<sup>10</sup> Docket No. UM 1976, *Smart Grid Testbed Phase II Proposal, Flexible Feeder Demonstration Supplement*, (Sept. 15, 2023) <https://edocs.puc.state.or.us/efdocs/HAH/um1976hah151930.pdf>.

resource (DER) adoption forecasts, and development of energy efficiency and DER measures for customers. NREL, as a technical partner, used power flow software OpenDSS to develop a digital twin of the distribution feeders in the study area to establish a baseline for modeling and evaluation. Planning activities included a robust campaign development to engage the community and develop informed marketing. This preparatory work enables the Flexible Feeder team to enter the market in Q4 2023, pending regulatory approval.

Staff notes that some of the activities identified in the first two years in the initial project plan will be executed in Years 3–5. These include elements of contractor engagement and training, and the launch of the campaign. PGE retained budget from Years 1–2 for these activities and Staff discusses that carryover in the next section.

### **Flexible Feeder, Years 3–5**

Years 3–5 represent the implementation period for the Flexible Feeder demonstration. During this time, the project team will focus on engagement, enrollment, and continued customer participation. The project will test new delivery channels and incentives. The team expects to achieve the 1.4 MW flexible load resource via a combination of energy efficiency and DERs including thermostats/HVAC control, smart water heaters, insulation, solar smart inverters, EV charging, and battery energy storage. Staff notes that access to existing energy efficiency incentives and flexible load programs are available to all PGE customers today. However, the Flexible Feeder specifically targets a higher concentration of these combined resources in one small geography served by two PGE feeders.

The project's learning objectives are to:

- Provide insights into the technical potential of DERs to serve as a resource for distribution and transmission operations,
- Demonstrate the combined value of building efficiency and flexible load technology to deliver grid services, while improving occupant comfort and satisfaction,
- Develop and deploy grid controls focused on scalability, resilience, and grid services,
- Develop insights into low income and underserved customer adoption of energy efficiency and demand response measures.

The budget to implement Years 3–5 covers PGE incremental staffing, customer incentives, software and controls, customer engagement, contractor support, and a third-party evaluation. Staff expects robust evaluation activities due to requirements of

DOE's Connected Communities grant,<sup>11</sup> in addition to impact and process evaluations typically conducted for Company demonstrations.

The project team developed a go-to market strategy that includes high-touch, personal engagements, and multiple methods of reducing participation and cost barriers. As one example, CEP will canvas the neighborhood; offer free Home Energy Scores for single family homes to document energy efficiency and DER opportunities; and provide no-cost deep energy retrofits for qualified low income or underserved households. CEP will pay for the no-cost energy retrofits with external funding outside the scope of this budget.

Beyond the no-cost retrofits, the Flexible Feeder team worked collaboratively to further reduce costs for market-rate participants. Energy Trust developed custom energy efficiency offerings to maximize incentives based on both energy efficiency and flexibility value. Where significant costs remained, PGE is using the Flexible Feeder budget to layer additional upfront incentives. Ongoing incentives for participation in the flexible load offerings are also included in the Flexible Feeder incentive budget.

Staff and the DRRC are aware of and supportive of the anticipated incentives. Staff appreciates PGE's consideration of the customer experience for those currently enrolled in flexible load offers via separate tariffs. Specifically, Staff supports the use of Schedule 13 as an additional layer on top of the existing tariffs to offer increased incentives and to enable more latitude with how PGE manages the flexible load resources. Upon completion of the Flexible Feeder demonstration, Schedule 13 can be canceled, and customers will automatically revert to the underlying tariff.<sup>12</sup>

#### *Stakeholder Feedback and Involvement*

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

In Years 1–2, PGE regularly updated the DRRC on Flexible Feeder. Quarterly meetings included process and status updates as well as detailed reporting of research and implementation-level details. The DRRC, including OPUC Staff, provided feedback on this draft Flexible Feeder demonstration plan for Years 3–5 in August 2023.

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<sup>11</sup> Ibid. P.11, The DOE evaluation plan includes six sections: Customer Benefits and Experience, Grid Services and Energy Impact, Benefit-Cost Analysis, Business Model, Greenhouse Gas Benefit, and Resilience Benefit.

<sup>12</sup> *Id.*, at 10-11, PGE discusses this dynamic in further detail in its filing.

### Conclusion

Staff supports and recommends approval of the budget modification and Years 3–5 of the Flexible Feeder demonstration plan. Staff highlights the considerable collaboration with regional partners, who provide valuable research, design, and implementation expertise. PGE and co-applicants on the SALMON project deserve recognition for the initiative to pursue and successfully win a competitive DOE Connected Communities grant. The DOE funding will drive qualitative and quantitative lessons beyond what ratepayer funding enables. Staff looks forward to ongoing collaboration and the eventual robust evaluation activities and communication of outcomes for future planning. Staff appreciates and encourages continued collaboration with members of the DRRC and leveraging of resources with regional partners.

### **PROPOSED COMMISSION MOTION:**

Approve detailed plans for Years 3–5 of the Flexible Feeder demonstration.



## 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.<sup>13</sup> Two of six Testbed Phase II demonstrations have submitted an Advice filing to amend Schedule 13 to begin customer implementation. In October 2022, PGE filed Advice No. 1437 amending Schedule 13 to implement Phase II activities for the EV Charging and Smart Solar Inverter demonstrations.<sup>14</sup> In the fourth quarter of 2023, Commission Staff expect an Advice filing to update Schedule 13 for implementation of the Flexible Feeder and Multifamily Bundle. 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 Under Consideration
2	Managed EV Charging/V2X	Managed EV Charging	Submitted and Approved
		V2X	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	Expected Q4 2023
6	Single Family New Construction Bundle	Submitted and Approved	Not Submitted

<sup>13</sup> 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>.

<sup>14</sup> Docket No. ADV 1437/Advice No. 22-24, note 5.