



## Analysis

### *Background*

On June 28, 2017, the Commission approved the original deferral filing for PGE's Demand Response Water Heater Pilot. The purpose of the Pilot is to retrofit existing water heaters in multifamily residences (MFRs) with demand response technology in order to help inform an effective design for a water heater demand response program. Program objectives include quantifying energy consumption that could be shifted to different times, determining appropriate incentive levels for customers, integrating and testing different technologies, and implementing different demand response dispatch strategies.

PGE's 2016 Integrated Resource Plan (IRP) discussed various types of demand response, including those that utilize smart water heaters. Smart water heaters (installed with digital controls and the ability to readily attach communications equipment) are an important demand resource for PGE as it provides system benefits by reducing peak demand.

The Pilot targets MFR housing because of its high concentration of electric water heaters. The Pilot, in addition to installing demand response-enabled technology on existing water heaters, may provide a monetary incentive to MFR property managers to replace aging water heaters with smart water heaters.

MFR demand response water heaters address a hard-to-reach segment of the residential market where few demand response technologies are currently feasible. Water heaters represent a distributed resource, which supports PGE's long-term smart grid initiatives, as each water heater can be controlled to meet specific demand response needs. Water heater demand response is a more flexible resource compared to other forms of demand response because it requires no notification, is a year-round resource, and has minimal customer comfort impact.

In 2018, a vendor for implementation and a Demand Response Management System (DRMS) was selected. Since May 2018, PGE has been successfully testing integration between water heater retrofit switches (a second vendor offering cell-enabled connectivity was selected in October 2019) and the DRMS to control water heaters with the switch.

As of February 2022, the Pilot has deployed 11,703 water heater retrofit switches and 39 new Smart water heaters (which communicate through built-in CTA-2045 enabled devices rather than retrofit switches) across 32 property management companies representing 102 distinct sites.

The Pilot has two types of retrofit switches in the field: Wi-Fi connected, which were the original switches utilized by the Pilot, and cellular-signal connected, which PGE began to deploy in late 2019. Evaluation data has identified that cell-enabled switches have a consistently higher connectivity rate<sup>1</sup> (79 percent season average, in the Company's current filing) than Wi-Fi connected switches. Wi-Fi connectivity has varied over time, improving substantially from early stages of the Pilot to reach over 70 percent, nearly equivalent to cell-enabled switches.<sup>2</sup> However, as noted in the Company's current filing, Wi-Fi connectivity has dropped significantly (50 percent season average).

Staff understands from discussions with the Company this is due to the fact Wi-Fi connected switches require occasional maintenance (such as router rebooting), without which, they are prone to signal degradation. Due to these issues, PGE stopped retrofitting water heaters with Wi-Fi connected devices in October 2019. However, there are several thousand Wi-Fi connected switches deployed in the field, and the Company has communicated to Staff it is evaluating the most cost-effective approach to handling connectivity issues. Staff is eager to hear the outcomes from the Company's evaluation.

The deferred amounts will be recovered in a manner approved by the Commission and consistent with the terms of Schedule 4 and Schedule 135.

#### *Description of Expense*

Expenses for this deferral include: the cost of implementing the communication interface; managing defaults or repairs; managing new participant enrollment; software licensing; data plan subscription; customer and property manager incentives; and PGE marketing.

#### *Reason for Deferral*

The use of deferred accounting for this Pilot will minimize the frequency of rate changes and match appropriately the costs borne by, and benefits received by customers.

Additionally, PGE seeks reauthorization to defer the expenses associated with its Demand Response Water Heater Pilot. Without reauthorization, this deferral will expire on April 18, 2022. The continuation of the deferral will minimize the frequency of rate changes and match appropriately the costs borne by, and benefits received by customers. The reauthorization will continue to support the use of an automatic adjustment clause rate schedule, which will provide for changes in prices reflecting incremental costs associated with the Pilot.

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<sup>1</sup> Connectivity rate is the percentage of time that a water heater is connected online and is reachable by the DRMS.

<sup>2</sup> See various prior Pilot evaluations filed in UM 1827.

*Proposed Accounting*

PGE proposes to record the deferred amount as a regulatory asset in FERC Account 182.3, Other Regulatory Assets, with a credit to FERC Account 407.4, Regulatory Credits.

*Estimate of Amounts*

PGE estimates the incremental costs of the Pilot to be approximately \$2.7 million through the end of 2022, as shown in Table 1 below.

**Table 1  
 Pilot Cost By Year (\$)**

Year	2017 (4 mo.) Actuals	2018 Actuals	2019 Actuals	2020 Actuals	2021 Actuals	2022 Forecast	Total
<b>Pilot Cost</b>	\$60,583	1,073,623	2,999,211	1,687,512	2,039,560	2,709,878	10,570,367

*Information Related to Future Amortization:*

- Earnings review – An earnings review is generally required prior to amortization of deferrals, pursuant to ORS 757.259(5). However, given the types of costs being deferred for a pilot conservation program, an earnings review will not be performed.
- Prudence Review – A prudence review should be performed by the Commission Staff as part of their review of this deferral’s annual reauthorization filing or application to update Schedule 135.
- Sharing – There is no sharing under the filed mechanisms.
- Rate Spread/Design – The deferred costs for this Pilot as recovered through Schedule 135 will be allocated to each schedule using the applicable schedule’s forecasted energy based on an equal percent of generation revenue applied on a cent per kWh basis to each applicable rate schedule or in a manner approved by the Commission.<sup>3</sup>
- Three Percent Test (ORS 757.259(6)) – The three percent test measures the annual overall average effect on customer rates resulting from deferral amortizations. The three percent test limits (exceptions at ORS 757.259(7) and (8)) the aggregated deferral amortizations during a 12-month period to no more than three percent of the utility’s gross revenues for the preceding year. Because PGE is an electric utility, ORS 757.259(8) allows the Commission to consider up to a six percent limit. The limit for these deferrals will be determined at the time of amortization.

<sup>3</sup> Special Condition 1 of schedule 135.

Conclusion

The proposed multifamily residential Demand Response Pilot is testing a path to cost-effectiveness for necessary demand side resource and associated communication infrastructure. The pilot is expected to produce benefits to ratepayers while advancing PGE's long-term demand response capabilities. Staff recommends approval of the request for reauthorization of incremental program costs.

PGE has reviewed this memo and agrees with its contents.

**PROPOSED COMMISSION MOTION:**

Approve PGE's request for reauthorization to defer costs associated with its Demand Response Water Heater Pilot for the 12-month period beginning April 18, 2022.