

ORDER NO. 14 353

ENTERED OCT 01 2014

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

UM 1657

In the Matter of

PORTLAND GENERAL ELECTRIC
COMPANY,

Annual Smart Grid Report.

ORDER

DISPOSITION: STAFF'S RECOMMENDATION ADOPTED

At its public meeting on September 23, 2014, the Public Utility Commission of Oregon adopted Staff's recommendation to accept Portland General Electric Company's (PGE) 2014 Smart Grid Report, as revised to include additional Commissioner recommendations. The Staff Report is attached as Appendix A. The combined list of adopted Staff and Commissioner recommendations is as follows:

- In the first quarter of 2015, PGE should report to the Commission on the findings from the company's Conservation Voltage Reduction (CVR) pilot program and the company's next steps for expansion of the CVR program.
- In the first quarter of 2015, PGE should provide the Commission: (1) an evaluation of the company's Critical Peak Pricing program; (2) any recommended changes; and (3) next steps for the program.
- Before the next report, PGE should conduct workshops, including one with the Commissioners, to explore how best to measure and track benefits of Smart Grid investments such as:
 - Improved power reliability and safety
 - Improved system visibility
 - Fewer and shorter outages
 - Faster outage/fault identification
 - Quicker, more efficient customer service
 - Extend life of assets and minimize asset downtime or death
 - New customer services
 - Integration with demand response and distribution generation resources

As part of the workshops, PGE should explore the development of metrics beyond the System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), and others currently in use.

- Before the next report, PGE should report to the Commission on the company's evaluation of deployment of more synchrophasors in its system.
- In the next report, PGE should provide information on PGE's Smart Heating, Ventilating, and Air Conditioning, and Smart Thermostats pilot, including what will be tested and how success will be measured.
- In the next report, PGE should share lessons learned from the Salem Smart Power Project and how results will be: (a) documented and shared; (b) built upon going forward; and (c) evaluated in terms of cost effectiveness.
- PGE should document use of smart inverters in its service area and report on future initiatives.
- In the next report, PGE should report on its evaluation of whether to actively promote voluntary residential and small commercial time of use pricing programs.

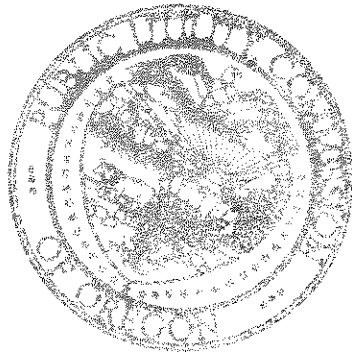
Made, entered, and effective OCT 01 2014

COMMISSIONER ACKERMAN WAS
UNAVAILABLE FOR SIGNATURE

Susan K. Ackerman
Chair

John Savage
John Savage
Commissioner

Stephen M. Bloom
Stephen M. Bloom
Commissioner



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 Court of Appeals in compliance with ORS 183.480 through 183.484.

ORDER NO. 12 333

ITEM NO. 1

**PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: September 23, 2014**

REGULAR X CONSENT _____ EFFECTIVE DATE _____ N/A _____

DATE: August 18, 2014

TO: Public Utility Commission

FROM: Juliet Johnson 

THROUGH: Jason Eisdorfer, Maury Galbraith, and Aster Adams   

SUBJECT: PORTLAND GENERAL ELECTRIC: (Docket No. UM 1657) Annual Smart Grid Report.

STAFF RECOMMENDATION:

Staff recommends the Commission accept Portland General Electric's (PGE or Company) 2014 Smart Grid Report filing as having met the requirements of Order No. 12-158 established in Docket No. UM 1460. Staff also recommends the Commission accept the recommendations described below for future PGE Smart Grid Reports.

DISCUSSION:

Background

PGE submitted their second annual Smart Grid Report on May 30, 2014 as directed in Commission Order No. 12-158 (Docket No. UM 1460). On April 15, 2014, prior to filing its report, PGE held a Smart Grid workshop to receive and consider feedback from stakeholders on PGE's 2014 Smart Grid *Draft* Report.

The Oregon Public Utility Commission's (OPUC) original Smart Grid Guidelines, Order No. 12-158, states:

The first report must include all smart-grid reporting elements identified in this order. Subsequent reports need only include incremental additions and updates of all elements in the first report

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Prior to submitting this report PGE asked Staff what level of detail they expected to see in this and other subsequent reports. Staff asked that the following be included in the 2014 Smart Grid Report:

- Recap the overall strategies, goals, and objectives and identify any changes in these items
- Provide an update on work in progress items
- Provide an update on future initiatives
- Provide information on any other incremental additions and updates
- Provide an updated timeline for present and future activities

Staff asked PGE to include enough context in its 2014 and subsequent annual smart grid reports such that someone reading the report for the first time, who had not read previous reports, could gain an understanding of the Company's initiatives.

PGE's first annual Smart Grid Report was submitted on May 31, 2013. A Special Public Meeting was held on August 7, 2013, where the report was presented to the Commission. Order No. 13-311 was issued on August 28, 2013, memorializing the Commission's direction given at the August 7, 2013 Public Meeting. In Order No. 13-311 the following requirements were set forth as needing to be addressed in PGE's 2014 Smart Grid Report:

1. Continue to evaluate and explore options for the use of its two-way communication platform and Advanced Metering Infrastructure (AMI).
2. Continue to evaluate and explore the use of Conservation Voltage Reduction (CVR).
3. Seek stakeholder involvement earlier in the process of preparing the next report.
4. Include a roadmap (with dates) that includes how PGE plans to systematically evaluate the myriad of smart grid options available to the company. List and prioritize specific smart grid investments and show how the work plan and any pilot projects will be organized in order to evaluate the smart grid projects.
5. Evaluate traditional non-smart grid investments and applications as alternatives to smart grid investments and seek to identify the most cost-effective options for meeting its objectives and its customers' needs.

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6. Provide more information about how traditional demand side management programs can be and are being integrated with smart grid initiatives.
7. Provide more information on the costs and benefits of smart grid initiatives for low income customers.
8. Include a summary of how PGE's smart grid activities relate back to the AMI objectives proposed in the stipulation approved by the Commission in Docket No. UE 189. See Order No. 08-245, Appendix A 9.
9. Identify investments in smart grid infrastructure and explain what is working and what is not working, and explicitly state whether the two way communication benefits of AMI's will be recognized.
10. Provide an evaluation of the benefits and costs of energy tracker to PGE's ratepayers, including Phase II.
11. Implement a pilot conservation voltage reduction program using the constant implementation method, and evaluate customer side benefits in the overall cost benefit analysis of comparing the peak shaving and constant implementation programs.
12. Accelerate the pilot for smart HVAC and smart thermostats.
13. Provide a more concrete analysis of the qualitative and quantitative benefits related to power quality, reliability, and reduced costs to ratepayers.

Interested parties were asked to file written comments on PGE's 2014 Smart Grid Report by July 1, 2014. Smart Grid Oregon (SGO) and the Citizen's Utility Board (CUB) filed written comments. In its reply comments issued on July 29, 2014, PGE addressed Staff's comments but did not respond directly to CUB's or SGO's comments.

Analysis

Staff reviewed PGE's 2014 Smart Grid Report. Staff appreciates the quality and readability of the report and the overall responsiveness demonstrated by PGE in the 2014 Smart Grid Report. PGE indicates it will focus its efforts in the following initiatives, which Staff supports:

- Enable Smart Grid capabilities when equipment fails or becomes obsolete.

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- Be strategic with regard to the Smart Grid technologies pursued, looking for opportunities to provide customers with more choices, higher reliability, and greater value.
- Use proven and interoperable technology as industry standards emerge (when feasible).
- Work collaboratively to demonstrate technologies in the early stages of commercialization, when those technologies address an immediate need (e.g., renewables integration) or have a particularly strong value proposition.
- Track early stage technologies through industry organizations, such as the Electric Power Research Institute (EPRI) and standards development through working groups, including the National Institute of Standards and Technology (NIST) and the Smart Grid Interoperability Panel (SGIP).

Requirements from Order No. 13-311

Below Staff addresses each of the requirements from Order No. 13-311 resulting from PGE's previous Smart Grid Report.

#1, #8, and #9 AMI and Smart Grid

In the order that followed the last Smart Grid Report, it was asked that PGE: a) continue to evaluate and explore options for the use of its two-way communication platform and AMI, b) include a summary of how PGE's smart grid activities relate back to the AMI objectives proposed in the stipulation approved by the Commission in Docket No. UE 189. (See Order No. 08-245, Appendix A 9), and c) identify investments in smart grid infrastructure and explain what is working and what is not working, and explicitly state whether the two way communication benefits of AMI's will be recognized.

In PGE's 2014 Smart Grid Report, a designated appendix (Appendix A) addressed issues about how PGE is leveraging AMI for smart grid, particularly around two-way communication. PGE acknowledges that two-way communication is an important aspect of the smart grid. PGE maintains that it uses the two-way features of the AMI system each day to read meters and communicate with distribution sensors. The system is also used to 'ping' meters to confirm outages. PGE states that it uses the AMI network to provide residential and business customers services like "real-time"

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alerts with Energy Tracker. The actual delivery is via email or text message, but these media are much less expensive than creating the same capability with the AMI system directly. PGE says its objective is to create benefits using the AMI system, but the way it communicates these benefits to residential customers will often be through media that do not include the AMI system, particularly for cost reasons. PGE goes on to explain that if sub-hour latency becomes an important requirement, for example to implement direct load control, then AMI may be useful, but even then alternative communication media may be more cost effective.

PGE explains that the barrier to launching demand response at scale is not now and has never been the cost of providing communications. If a demand response project could enlist 100,000 customers, it might be cost effective to use the AMI backbone with added capabilities in the form of additional hardware and a back-office application module in lieu of paying third parties a recurring cost for providing communications. It could be that even in that situation, paying a third party for communications would be more cost effective.

In Appendix A, PGE went through each of the 12 possible uses of AMI that were discussed in the AMI review process in Docket No. UE 189. In Order No. 08-245 from Docket No. UE 189 a "Customer and System Benefits" document listed 12 possible benefits or uses of AMI benefits separated into the following three categories: 1) Demand Response Related Activities and Benefits, 2) Distribution Assets Utilization, and 3) Outage Management. In Appendix A, PGE went through each of the 12 possible uses of AMI and mapped them to the Smart Grid Report. The following table lists the 12 items and how PGE is addressing them.

Item #	AMI Benefit identified in UE 189	PGE Response
Demand Response Related Activities and Benefits		
1	Information-Driven Energy Savings	Energy Tracker implemented
2	Integrated Resource Plan (IRP) Capacity Planning	Demand Response (DR) activities planned that will be large enough to be considered a capacity resource in IRP (ex: commercial and industrial firm load reduction, residential load control, smart water heaters).
3	Critical Peak Pricing	Pilot completed
4	DR-Ready Appliance Market Transformation	Smart water heater pilot in planning stages and working with Electric Power Research Institute (EPRI) on collaborative research project.
Distribution Asset Utilization		

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5	Avoided Service Transformer Failures	Will require detailed development of a Distribution Management System (DMS) –PGE is considering adding a DMS in the 2018-2020 timeframe.
6	Proper Transformer Sizing	Currently using AMI data in a limited, labor intensive way to prioritize transformer replacement. Optimization at scale will require a DMS. (see #5)
7	Feeder Conductor Work	Pilot will start after Geographic Information System (GIS) upgrades in place, optimization at scale will require a DMS. (see #5)
Outage Management		
8	General Outage Management	Full capability will exist when new enterprise systems are implemented.
9	Avoided Trouble Calls	Smart meter being used to 'ping' meters, avoiding trouble calls where PGE service has not been interrupted. More benefit once new Outage Management System (OMS) is in place.
10	Faster On-Premise Outage Response	Capability will exist once OMS and GIS systems are in place.
11	Improved Storm Management	Capability will exist once OMS and GIS systems are in place.
12	Faster Fault Location Identification	Pilot underway and PGE working with AMI vendor on a fault detection device that will communicate through AMI network.

#2 and #11 Conservation Voltage Reduction (CVR)

In Order No. 13-311 the Commission directed PGE to continue to explore the uses and benefits of Conservation Voltage Reduction (CVR) and implement a pilot conservation voltage reduction program using the constant implementation method, and evaluate customer side benefits in the overall cost benefit analysis of comparing the peak shaving and constant implementation programs.

The Company provided results of its CVR simulation and pilot in Appendix D of the 2014 Smart Grid Report. PGE reports that in 2012 a study was conducted to determine the viability of implementing a CVR program without incurring power quality issues.

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Simulated results confirmed the conclusions made by the Northwest Energy Efficiency Alliance (NEEA) that CVR will reduce demand and the customers' energy consumption. CVR was then implemented at two substations within PGE's service territory. Implementation was completed in the winter of 2013. Initial results validated the conclusions from the simulation.

The initial simulation only looked at the ability of CVR to shave peak demand. The simulation showed that implementation of CVR as a peak shaving method is most advantageous during winter peak loading and least beneficial during summer peak loading. This was expected, because resistive loads (e.g., electric furnaces) are more prevalent during the winter months.

Results of the physical CVR pilot showed that energy consumption was reduced as a direct result of CVR implementation. CVR is more beneficial in the winter due to increase in resistive loads. For the Hogan South pilot, the actual kWh reduction in the 28 days of the winter pilot was 24,843 kWh and the energy savings in the 96 days of the summer pilot was 43,425 kWh. The daily potential cost savings for a typical residential customer (i.e., one who consumes 1,000 kWh per month) as a result of CVR implementation is \$0.02 in the winter and \$0.01 in the summer, which corresponds to an estimated annual savings of \$6.62 for a typical residential customer. A review of the voltage data at the 29 monitored customer meters show operating voltages were consistently within the acceptable voltage bandwidth.

PGE indicates that determining whether CVR is a cost-effective method to reduce energy consumption depends on the definition of "cost-effective." PGE explains that the total one-time cost to implement CVR at the Hogan South substation is \$70,816 and the projected annual savings for all customers served by the Hogan South transformer is \$30,811. PGE says that "at the conclusion of the pilot project, a PGE financial analyst will make the determination as to whether or not CVR is a cost-effective method to reduce energy consumption."¹

Staff remains very interested in these results and will continue to monitor closely how PGE establishes the cost effectiveness of CVR pilots and how PGE plans to proceed post pilot. Staff recommends that in the next Smart Grid Report, the Company should provide detailed analysis of the cost effectiveness of PGE's CVR efforts and specific next steps with timelines, cost, and savings estimates. Staff is also in the process of preparing a report that summarizes the CVR efforts and results of all electric investor owned utilities (IOUs) in the state, including PGE. This report will be provided to the Commission in early 2015.

¹ PGE's 2014 Smart Grid Report, page 35.

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#3 Stakeholder Input

Order No. 13-311 says that PGE should seek stakeholder involvement earlier in the process of preparing the next report. Staff appreciates that PGE did seek stakeholder involvement earlier in the process this time.

#4 Roadmap

Order No. 13-311 says that PGE should include a roadmap (with dates) that includes how PGE plans to systematically evaluate the myriad of smart grid options available to the company and list and prioritize specific smart grid investments and show how the work plan and any pilot projects will be organized in order to evaluate the smart grid projects.

PGE provided the requested roadmap on page 25 of the 2014 Smart Grid Report. Staff is satisfied that this item has been met.

#5 Non-Smart Grid Investments

Item five is to evaluate traditional non-smart grid investments and applications as alternatives to smart grid investments and seek to identify the most cost-effective options for meeting objectives and customers' needs. In response to this item, PGE detailed non-smart grid efforts it currently uses to increase grid resiliency and reliability. In Section 7.1 of the report, PGE outlines its Vegetation Management Program, which has given PGE one of the lowest tree-related outage rates in the industry. Staff is satisfied that PGE addressed this item.

#6 Demand Side Management

The Commission directed that more information be provided about how traditional demand side management programs can be and are being integrated with smart grid initiatives. PGE describes that Energy TrackerSM, which is a tool that provides residential and general business customers access to their smart-meter data through their accounts, is helping customers save energy² and is helping to direct customers to Energy Trust Programs.^{3,4} PGE goes on to say that as part of future initiatives they will test customer response to several different pricing programs to determine which it wants

² PGE reports that customers that are using Energy Tracker have reduced their annual energy consumption three percent faster (332 kWh) than non-Energy Tracker customers.

³ Energy Tracker connected over 2,200 customers to the Energy Trust's website for energy efficiency programs.

⁴ PGE 2014 Smart Grid Report, page 14

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to pursue on a program basis once the computer system is upgraded. PGE will consider options that combine pricing programs with smart appliances/thermostats and energy management systems to maximize customer benefit and will work with Energy Trust to capture synergies of dynamic pricing with energy efficiency programs offered.⁵

PGE also indicates that if it pursues a HVAC demand-response program, it will seek to engage with Energy Trust to ensure energy efficiency (EE) benefits are incented and captured.

Staff appreciates these connections made between Energy Tracker, potential future dynamic pricing programs, and potential future HVAC demand response programs with Energy Trust programs. Staff would like to see PGE continue to engage with Energy Trust on smart grid initiatives going forward and report on those in future reports.

#7 Low Income Customers

The Commission adopted a recommendation made by Northwest Energy Coalition that more information is provided on the costs and benefits of smart grid initiatives on low income customers. PGE reports that it has provided information and demonstrations on Energy Tracker to Community Action Agencies (CAAs) that serve PGE customers. PGE also offered to train low-income weatherization auditors on Energy Tracker so they could walk through the information with a customer during the course of an audit.⁶

Relative to prepaid metering, PGE indicates it is monitoring the activities of utilities that offer prepaid metering. If PGE were to offer a prepaid metering pilot, it would actively engage with CAA's and low-income advocates on pilot design.

Staff appreciates the Company considering low income customers relative to Energy Tracker and prepaid metering. Staff recommends the Company continue to look at how low income customers can benefit from smart grid and ensure that low income customers are not inadvertently harmed by smart grid initiatives, including AMI. Staff is aware that AMI allows for remote disconnect for some customers. In Staff's initial comments back to PGE in this docket, we requested that more specific information be provided concerning how customers are being provided adequate notice and opportunities for payment prior to being remotely disconnected. In its reply comments, PGE provided a table that outlined in detail the Company's current practices for providing customers with adequate notification and options for payment prior to disconnection.

⁵ PGE 2014 Smart Grid Report, page 17

⁶ PGE's 2014 Smart Grid Report pages 14-15

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PGE also indicated in its reply comments that they will continue to research the benefits of a smart grid for low income consumers while considering ways the smart grid may cause inadvertent harm to low income customers and what mitigation strategies could be developed to prevent such harm.

#10 Energy Tracker

PGE was asked to provide an evaluation of the benefits and costs of Energy Tracker to PGE's ratepayers, including Energy Tracker Phase II. In Section 3.1.1 PGE described Energy Tracker and the benefits in terms of increased energy savings for customers using Energy Tracker. The only mention of the future of Energy Tracker is on page 18, in Section 3.3.5 where Green Button 2.0 is being discussed and it is mentioned that PGE will monitor Green Button 2.0 and the program will be considered when it updates Energy Tracker (currently planned post-Customer Engagement Transformation (CET) project). There is no other mention of Phase II Energy Tracker.

In our initial comments to PGE in this docket, Staff asked for more information about the future of Energy Tracker. PGE responded that they are currently in an information gathering stage concerning future enhancements to Energy Tracker for all customers. The Company noted that the ongoing CET project is currently placing a heavy demand on internal resources. When CET is completed, enhancements to Energy Tracker will take priority and PGE will describe planned activities in future smart grid reporting. Staff is satisfied with this response.

#12 HVAC Demand Response and Smart Thermostats

PGE was asked to accelerate the pilot for smart HVAC and smart thermostats. In page 17 of the report, PGE notes that it is currently considering a demand-response pilot via smart thermostats for 2015. In future reports or updates, Staff would like to understand: a) more about what is being considered, b) what criteria PGE plans to use to determine whether or not it will pursue such a pilot in 2015, and c) if a pilot is pursued, specifically what will be tested and how success will be measured.

#13 Analysis of benefits

In Commission Order No. 13-311, resulting from PGE's 2013 Smart Grid Report, it was suggested that PGE provide a more concrete analysis of the qualitative and quantitative benefits related to power quality, reliability, and reduced costs to ratepayers. Staff is not satisfied that this suggestion has been accomplished because the analysis is not clearly presented. In most cases qualitative benefits are described throughout the report in somewhat of an ad hoc and non-systematic or clear way. For the most part,

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quantitative benefits are not presented. Staff believes PGE could do better at providing this analysis, both qualitative and quantitative, in a clear and direct manner.

Staff made the above comments to PGE during our initial comments in this docket. PGE responded that, "To improve the presentation and transparency of benefits from smart grid projects, PGE is willing to hold workshops with OPUC Staff and other interested parties to develop parameters for presenting quantitative and qualitative cost-benefit analyses in line with Staff's expectations for future smart grid reports."⁷

Staff believes this is a good approach and looks forward to working with PGE and other parties in these workshops.

Other Items

Salem Smart Power Project (SSPP)

Staff commends PGE for their efforts on the Salem Smart Power Project (SSPP). PGE has regularly described what is being tested in the SSPP but has not yet talked in detail about results, learnings, and next steps. Staff notes that according to PGE's 2014 Smart Grid Report, the Pacific Northwest Smart Grid Demonstration Project, of which the SSPP is a part, will conclude at the end of this year.⁸ Staff recommends in the next Smart Grid Report the Company be very clear about how the learnings from the SSPP will be: a) documented and shared, b) built upon going forward, and c) evaluated in terms of cost effectiveness. Staff is very curious about how the project will go forward once the demonstration project ends and more broadly, how PGE plans to incorporate the lessons learned from the SSPP into future resource planning and program offerings.

Smart Inverters

PGE describes how it is experimenting with enhanced inverter functionality at its Baldock Solar Station to manage the voltage within an allowed operating range through dynamic reactive power control.⁹ PGE notes that enhanced inverter functionality also helps to achieve voltage and frequency ride-through capability so that distributed PV generators contribute to grid stability during system disturbances instead of disconnecting and exacerbating the problem. Staff requests PGE continue to document and report on efforts related to smart inverters and how they fit into the PGE's smart

⁷ PGE's Reply Comments in Docket No. UM 1657 filed July 29, 2014, pages 2 and 3

⁸ PGE's 2014 Smart Grid Report, page 21

⁹ PGE's 2014 Smart Grid Report, page 18

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grid vision and roadmap and provide an update to that effect in the next Smart Grid Report.

Time of Use Pricing

PGE's commercial and industrial time-of-day pricing program was expanded to include Schedule 83 customers in 2014. Now all customers with monthly demand in excess of 30 kW are on time-varying pricing. PGE also has a voluntary residential and small commercial time of use pricing program with 3,000 customers enrolled. For the last decade PGE has limited the promotion of the program (except to owners of electric vehicles) at the direction of the Portfolio Options Committee. PGE is re-evaluating whether to promote the program. In the next Smart Grid Report, Staff recommends PGE report back on their re-evaluation of whether to actively promote its voluntary residential and small commercial time of use pricing program.

PGE's Critical Peak Pricing pilot evaluation was completed. In general, each participating customer lowered their peak usage between 0.11-0.32 kW during the called events. Customer satisfaction with the program was relatively low (65 percent) compared to other pricing programs (75-85percent). A third-party evaluator assessed the pilot and results were filed with the Commission in May 2014. This evaluation of the pilot was provided was confidential. Staff recommends in the next Smart Grid Report that PGE report back on how it has responded to the recommendations of the third-party evaluator of the Critical Peak Pricing Pilot. PGE should also report on its next steps, if any, relative to a critical peak pricing program.

On page 17 of PGE's 2014 Smart Grid Report it states that PGE will be taking a serious look at which voluntary pricing options and models will offer the most value to its customers and will identify the programs it intends to pursue in the 2016 update of the Smart Grid Report. PGE is planning to launch a project in 2015 that would test customer response to several different pricing programs to determine which it would want to pursue post-CET.

Parties' Comments

SGO and CUB provided written comments in this docket. Each are summarized below:

Staff appreciates SGO's detailed and extensive comments. What follows is Staff's summary of SGO's comments.

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SGO believes PGE's Smart Grid Plan is exemplary. SGO suggests that if other utilities in the region would take similar actions and collaborate, the region would move more quickly to a fully functioning smart grid. SGO believes it is crucial to speed up the movement to a smart grid. SGO supports storing power in water heaters, batteries, and other solutions that automate efficiency and create demand response to serve peak loads and provide more flexibility, resiliency, and responsiveness to the grid.

SGO talks about a chicken and egg problem where end users of electricity are reluctant to buy smart appliances because utilities do not yet have the means to control them for system and customer benefits. Conversely, utilities do not invest in means to control smart appliances because not enough customers have them. SGO laments that this chicken and egg problem creates a huge barrier to rapid development of a smart grid. SGO points out that PGE is taking an incremental approach and that, "because of the chicken and egg problem, many parts [of the smart grid] cannot be implemented cost-effectively today without a government mandate."¹⁰

SGO goes on to make the following comments aimed at PGE's future actions. Staff's responses accompany each bullet:

- SGO would like PGE, OPUC, and the public to react to the "chicken and egg" analogy when addressing comments on the plan and it would like to hear PGE's and the OPUC's strategy for overcoming this barrier. SGO would like to hear what help might be needed from legislators, the OPUC, Smart Grid Oregon, and others.
 - *Staff response: Staff agrees there are multiple barriers to both the adoption of smart appliances and utilities developing the means to beneficially utilize smart appliances. Staff sees the annual Smart Grid Reports that must be filed by electric IOUs in Oregon and the public process around those reports as positive steps toward incorporating smart grid elements into the utility system in a way that benefits Oregon ratepayers. During the recent strategic planning process of the NEEA, a letter from the Commissioners to the NEEA Board requested that NEEA be proactive in market transformation efforts related to demand response. Staff sees NEEA as an organization that could help move the ball forward on demand response ready appliance and overcoming interoperability barriers.*

¹⁰ Smart Grid Oregon comments on PGE's 2014 Smart Grid Report, pages 1-2

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- SGO wants PGE to provide leadership in the deployment of interoperability standards such as OpenADR and IEC 61850, which SGO indicates would probably require OPUC support and rate-basing of smart grid standards.
 - *Staff response: Staff recognizes the importance of interoperability when it comes to demand response and smart grid. At PGE's request, Staff would be willing to consider what an appropriate level of PGE involvement in this arena would look like. Perhaps this issue can be discussed in more detail during the stakeholder involvement process for the next report.*
- SGO said it is important for PGE to maintain progress it made in Transactive Control/Transactive Energy (TC/TE) as part of the NW Regional Smart Grid Pilot. SGO suggests PGE maintain the TC node at the Salem Smart Power Pilot Project and continue to work with BPA and the other utilities on the transactive control system.
 - *Staff response: Staff expects PGE to capitalize on learning from the SSPP in a way that makes sense for ratepayers.*
- SGO reiterated comments it made on PGE's 2013 Smart Grid Report, including a statement that funding for staff, pilot projects, and implementation should be authorized to implement PGE's Smart Grid plan.
 - *Staff response: Staff encourages PGE to continue to spell out its plans related to smart grid in its annual reports and describe how those efforts provide a benefit to PGE's ratepayers.*
- SGO ends with a highly technical comment recommending a pilot project at one of PGE's substations that moves to reduce the hardwiring needed to protect relays by digitizing copper wiring in a specific way. SGO states that the OPUC should allow training for these types of systems and pilot projects to be recoverable in rates when included as part of smart grid development.
 - *Staff response: Staff will consider any such requests or expenditures in an appropriate rate making proceeding.*

SGO also made the following points, for which Staff has no comments at this time:

- SGO would like to see PGE's long-term vision of itself as a comprehensive energy services company using smart grid technologies and strategies.

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- SGO expresses support for PGE replacing four obsolete enterprise systems (Outage Management System, Geographic Information System, Customer Information System, and Meter Data Management System) and supports PGE's new systems being consistent with the bullet above.
- SGO suggests PGE should discourage proprietary systems linked to a single manufacturer as it links demand response programs to the smart thermostats.
- SGO encourages PGE to continue to participate in the federal Green Button program.
- SGO applauds PGE for its Dispatchable Standby Generation Program with over 100 MW of available distributed energy. SGO wants to see PGE take this program to the next level by accommodating smaller distributed assets (less than 500 kw) from sources such as residential solar, fuel cells, electric vehicles, and station battery storage.
- SGO encourages PGE to look at creating models to better fund programs that test new grid technologies with the intent of deploying solutions at the commercial scale that best fit the regions energy needs.
- SGO wants to see PGE prioritize working with regional utilities and technical companies on pilots and demonstrations.

CUB also provided comments on PGE's 2014 Smart Grid Report. Below is a summary of CUB's comments:

- CUB notes that PGE responded to past stakeholder comments, in particular how its current smart grid projects relate back to the goals discussed in Docket No. UE 189 (PGE's Advanced Metering Infrastructure Docket).
 - *Staff response: Staff agrees and is appreciative that PGE was responsive and included more information about how smart grid efforts are utilizing AMI infrastructure.*
- CUB states that Idaho Power's and PacifiCorp's smart grid reports are more robust in nature, outlining both the groundwork and current projects in far more detail. CUB indicates it would like to see detail and robustness in PGE's reports. CUB recommends PGE review the reports of these other utilities.

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- *Staff response: Staff notes that PGE's second report contains less detail than its initial annual smart grid report, in large part due to different reporting requirements as spelled out in Order No. 12-158 established in Docket No. UM 1460. As mentioned previously, Staff expects to see more quantitative and qualitative analyses of PGE's smart grid efforts in the next report.*

Recommendations

Staff recommends the Commission acknowledge PGE's 2014 Smart Grid Report as having met the requirements of Order No. 12-158 in Docket UM 1460. Staff also recommends the following:

- In the next smart grid report, provide detailed analysis of the cost effectiveness of PGE's CVR efforts and specific next steps with timelines, cost and savings estimates. If possible, the same information should be provided to Staff to include in the CVR Summary Report being developed.
- Related to PGE's smart HVAC and smart thermostats pilot, in future reports or updates Staff would like to understand a) more about what is being considered, b) what criteria PGE plans to use to determine whether or not it will pursue such a pilot in 2015, and c) if a pilot is pursued, specifically what will be tested and how success will be measured.
- Staff supports PGE's proposal to hold workshops with Staff and parties to develop parameters to improve the presentation and transparency of qualitative and quantitative benefits of smart grid projects. Such parameters should be included in PGE's next annual smart grid report.
- Staff recommends in the next smart grid report that the Company be very clear about how the lessons learned from the SSPP will be: a) documented and shared, b) built upon going forward, and c) evaluated in terms of cost effectiveness.
- Staff requests PGE continue to document and report on efforts related to smart inverters and how they fit into the PGE's smart grid vision and roadmap and provide an update to that effect in the next smart grid report.
- In the next smart grid report, Staff recommends PGE report back on their re-evaluation of whether to actively promote its voluntary residential and small commercial time of use pricing program.

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- Staff recommends in the next smart grid report, PGE report back on how it has responded to the recommendations of the third-party evaluator of the Critical Peak Pricing Pilot. PGE should also report on its next steps, if any, relative to a critical peak pricing program.

PROPOSED COMMISSION MOTION:

Portland General Electric's (PGE or Company) 2014 Smart Grid Report is accepted with Staff's recommendations set forth immediately above in the "Recommendation" part of this memorandum.

UM 1657 PGE's 2014 Smart Grid Report