

**PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT**

PUBLIC MEETING DATE: October 15, 2013

REGULAR X **CONSENT** _____ **EFFECTIVE DATE** _____ **N/A** _____

DATE: October 14, 2013

TO: Public Utility Commission

FROM: Brittany Andrus *AC for BA*

THROUGH: Jason Eisdorfer, Maury Galbraith, and Aster Adams
I MGF

SUBJECT: PACIFICORP: (Docket No. UM 1667) Annual Smart Grid Report.

STAFF RECOMMENDATION:

Staff recommends the Commission accept PacifiCorp's (Company) 2013 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 suggestions described below for future PacifiCorp Smart Grid Reports.

DISCUSSION:

Background

Order No. 12-158 in UM 1460 established reporting requirements for electric utilities in Oregon related to smart grid. Prior to this filing, PacifiCorp held a workshop on June 11, 2013, to gain stakeholder input. PacifiCorp filed its 2013 Smart Grid Report on August 1, 2013. Commission Order No. 12-158 required utilities to include, at a minimum, the following main elements in their Smart Grid Annual Reports:

1. Smart Grid Strategy, Goals, and Objectives.
2. Status of Smart Grid Investments, including transmission, distribution networks, customer information, distributed resources and demand-side management and general business enhancements. In addition, the Company must describe smart grid investments and applications it plans to undertake over the next five years and at a minimum address how the planned investments fit in the utility's Integrated Resource Plan (IRP).

3. Smart grid Opportunities and Constraints over the next five years including evaluations and assessments of technologies the utility plans to undertake and a description of any pilots.
4. Targeted Evaluations pursuant to Commission-approved stakeholder recommendations.
5. Related Activities.

Order No. 12-158 lists Commission Guidelines for Utility Action when considering evaluating and implementing potential smart grid investments. OPUC Order No. 12-158 at 6-7.

The standard of review Staff plans to use for annual Smart Grid Reports, as set out in Order No. 12-158 at 4-5:

1. Whether the Company met the guidelines set forth by the Commission in Order No. 12-158; and
2. Whether the Company addressed prior Commission-approved recommendations from previous year's Smart Grid Report reviews regarding potential smart grid investments and applications.

Because this is PacifiCorp's first Smart Grid Report filing, there are no previously agreed to Commission-approved recommendations from prior reports.

Description of the Filing

PacifiCorp explains it will follow the strategic principles summarized below to introduce incremental smart grid development (PacifiCorp's 2013 Smart Grid Report at 5):

- Ensure that smart grid investments support providing adequate service at reasonable and fair prices.
- Institute cost-effective standards and equipment specifications that enable implementation of smart grid compatible devices.
- Work with manufacturers to discuss smart-grid products and determine their applicability to PacifiCorp's system.
- Research industry projects and events and work with industry organizations in order to apply this knowledge to PacifiCorp's benefit.

PacifiCorp discussed the main challenges and risks facing the Company and the deployment of smart grid technologies. Those challenges and risks include premature obsolescence of equipment and software for early adopters of technologies, the security of customer and operational data, customer communications needs, meter data management, and smart grid technologies to address significant two-way energy flows from distributed generation systems.

PacifiCorp also provided an economic review of smart grid including the framework for cost-benefit studies grouped in six case scenarios consistent with a Smart Grid Roadmap. However, none of the case scenarios were found to be cost effective. The Company concluded that a comprehensive smart grid system throughout its service territory would not be cost effective but that changes in usage and improved conservation are among factors that will likely change the electric industry.

PacifiCorp listed the following smart grid related projects, with additional potential projects currently in research and planning stages. Smart Grid Report starting at 33.

- Oregon Advanced Metering Project – Develop an advanced metering system strategy to be delivered by October 2014.
- Transmission Synchrophasor Demonstration Project, in conjunction with the Western Electricity Coordinating Council (WECC) - initial phase of the project to finish by the end of April 2014.
- Conservation Voltage Reduction Pilot Project in Washington State – the pilot was not found to be cost effective. A periodic review of the state of the technology, measurement protocols and the economics of such projects will be included in future reports. Smart Grid Report at 38.
- Dynamic Line Rating (DLR) Projects – One 240 kV project was completed in early 2013 and another multiple-line 345 kV project is currently under construction and is scheduled to be completed and operational in Spring 2014.
- Communicating Faulted Circuit Indicators – a pilot project is scheduled in the next 12 months to fully ascertain the benefits and costs of these communicating sensors and to gain experience with the operational elements involved in their application. Smart Grid Report at 39.
- Customer Engagement – Customers have full access to 24 months of electric usage history.
- Direct Load Control Cool Keeper Program - PacifiCorp is currently in the process of upgrading the existing Cool Keeper system to improve the remote devices and enable measurement and verification of savings during events. Smart Grid Report at 41.

- Pay-for Performance Irrigation Program – the average demand response capacity of the program and pricing information was included in the Company's 2013 Integrated Resource Plan.
- Distributed and Renewable Resource Enhancements – this includes the refinement of the Company's wind integration modeling approach.

Summary of Other Parties' Comments

Citizens' Utility Board of Oregon (CUB) and NW Energy Coalition (NVEC) filed comments. Party comments are summarized by key points below:

CUB urges PacifiCorp to balance its risk-averse approach to smart grid technology with "practical, innovative endeavors." CUB identifies two successful programs that PacifiCorp has implemented, the direct load control Cool Keeper Program and the Pay-for-Performance Irrigation Program, and asserts that PacifiCorp shows no sign of wanting to capitalize on these achievements and questions why PacifiCorp has made no recent attempt to significantly expand on these initiatives or use them to design new programs. CUB Comments at 3.

CUB believes that PacifiCorp's Smart Grid Report focuses too heavily on pricing programs and believes that "the true power of the smart grid lies in two-way communication potential." CUB Comments at 3. CUB notes that pricing mechanisms will not always provide a sufficient behavioral incentive and that the Company should explore more direct load control programs. CUB Comments at 4. Finally, CUB is disappointed that PacifiCorp does not include social benefits in its analysis. CUB acknowledges that social benefits may be difficult to precisely quantify, they should be quantified where they exist. CUB Comments at 5.

NVEC comments that the report would benefit from a more cohesive discussion of PacifiCorp's strategy, goals and objectives for eventual smart grid implementation. NVEC asserts that the Company should expand the section regarding the cost/benefit analysis and provide more information about its specific implementation plans. NVEC Comments at 1. NVEC also believes that PacifiCorp should replace its conservative approach to Smart Grid with more innovation and comments that "the Company is dismissing early implementation of several promising aspects of Smart Grid applications" including distributed energy systems, direct load control programs, and vehicle to grid implementation. NVEC Comments at 1-2. NVEC suggests that PacifiCorp could strengthen its report by providing more information regarding what the Company is doing with respect to demand response, customer education, distributed generation, and plug-in vehicles, more discussion of its cost/benefit analysis, and more information about low-income customer protection. NVEC Comments at 2-3.

PacifiCorp Response

In response to CUB's and NWECA's criticisms regarding its conservative approach, PacifiCorp notes that "[i]n evaluating smart grid programs, the Company carefully balances the benefits of smart grid innovations against the costs of those innovations to customers." PacifiCorp's Reply Comments at 1. PacifiCorp disagrees with CUB's comment that PacifiCorp has not capitalized on its Cool Keeper program, noting that its Smart Grid Report reflects that PacifiCorp has upgraded the Cool Keeper program to increase the overall efficiency of the direct load control system and that the program continues to expand without an active marketing program. PacifiCorp's Reply Comments at 2, citing PacifiCorp's Annual Smart Grid Report at 40.

As discussed in the Report, an AMS installation throughout the Company's six-state service territory would be cost prohibitive at this time. Due to this constraint, the Company indicated that it is currently moving forward with a study that will investigate the costs and benefits of an advanced metering strategy for the states of Oregon and California. PacifiCorp's Reply Comments at 2, citing PacifiCorp's Annual Smart Grid Report at 33-24.

Staff Comments

Staff has reviewed the report against the requirements and guidelines laid out in Order No. 12-158. In total the Company met the requirements for the elements of the annual smart grid report. Staff has provided comments on specific guidelines that it believes the Company should address.

In general, Staff is concerned that the report contains a greater emphasis on the Company's monitoring, evaluation and strategy-level planning efforts than on specific pilots and implementation planning. This gap is especially noteworthy in the area of metering and reporting technologies that provide hourly interval data to residential and small commercial customers. These technologies also support the monitoring and verification (M&V) aspects of energy efficiency and demand response programs. Staff appreciates the fact that a full roll-out of smart grid technologies is not cost effective at this time. Staff also recognizes that significant work is underway at the transmission and distribution levels. However, concerns remain regarding the conservative approach to the customer level aspects of smart grid.

In Order No. 12-158, under Commission Guidelines for Utility Actions, item number 1 is, "General Utility Action: Utilities should be evaluating promising smart grid technologies and applications on an ongoing basis, developing plans for investments in a collaborative process with stakeholders, and seeking out investments that enhance

service and yield benefits to consumers.” The 2013 Smart Grid Report reflects many of the same constraining assumptions as the 2011 Report on Smart Grid Technologies provided in compliance with Order No. 11-172. For example, the 2013 report Benefits and Savings section states, “Consumer-based benefits are directly attributable to changes in consumer energy-use behavior and are unproven benefits with questionable sustainability,” with a footnote referencing a residential energy use report. Smart Grid Report at 53. The same sentence appears in that section of the 2011 report. Both reports go on to discuss pricing structures and the same obstacles. Staff would have expected to see an expanded assessment of the benefits and savings in the 2013 report.

Regarding the Oregon Advanced Metering Project, the Company states that it has started performing research and analysis that will lead to a “joint strategy” effort between the Smart Grid department and Metering, Transmission and Distribution operations, Information Technology, Engineering, Demand Side Management, and Telecommunications. Smart Grid Report at 34. The strategy is to be delivered by October 2014. Staff notes that this date falls two months after the date of the next Smart Grid Annual report, and recommends that PacifiCorp to provide at least the draft strategy in the 2014 annual report. In its upcoming strategy document, Staff requests that the Company list and prioritize specific benefits of smart grid investments, financial and otherwise, to Oregon customers. In addition, a work plan with dependencies and timelines for each component of the strategy is desired.

Report Structure – In its report, the Company included the current status of a range of efforts in different parts of the report. For example, the Fault Detection, Isolation and Restoration (FDIR) program is described in the more generic “Components of the Smart Grid” section of the report, but that section also notes that the Company has implemented a small number of projects using this technology. The bulk of the information on PacifiCorp’s projects is contained in the “Smart Grid Projects” section. In the interest of clearly communicating the Company’s plan and progress to date, Staff suggests that general technology information be confined to one section of the report, and specific pilots, projects, evaluations, and other efforts be summarized together.

Demand Response - Staff agrees with CUB’s assessment that the report puts heavy emphasis on price mechanisms and minimizes the role of direct load control programs. The Company states, “Technologies included in the study but not considered in the financial analysis include fully redundant (“self healing”) distribution systems, distributed energy systems (including electric vehicles) and direct load control programs.” Smart Grid Report at 3. Staff recommends that a full financial analysis of direct load control demand response programs be included in the next smart grid report, including not only

the existing Cool Keeper program but also water heating, commercial cold storage, and other commercial and industrial applications.

Distribution Management Systems - The Company included detailed descriptions of several technologies related to distribution management systems, and to some degree, provided the current status for each:

Interactive Volt-Var Optimization (IVVO) and Conservation Voltage Reduction (CVR) – PacifiCorp describes the applications for these technologies, then lists several risks it has identified with their implementation. Smart Grid Report at 25. Staff is familiar with these risks, and encourage the Company to continue evaluate these technologies for their voltage and power factor optimization, and potential for demand shifting and energy savings.

Centralized Energy Storage (CES) – PacifiCorp used battery storage to analyze the costs and benefits in this category. Smart Grid Report at 27. The Company found that CES did not provide sufficient benefits at the substation level, but that localized storage technology placed downstream from the substation provides the most benefit in avoided future infrastructure. The report also notes the Company's work with a partner to test flywheel energy storage technology that was terminated due to financial issues with that partner. Battery and other storage technologies are evolving, and Staff encourages the Company to continue pursuing these technologies in the context of smart grid, and to include a complete update on any evaluation or pilot efforts in this area in its next report.

Communicating Faulted Circuit Indicators (CFCI) – The Company states that it is researching CFCI applications in Utah, which have the potential to improve reliability indices such as customer average interruption duration index (CAIDI) by reducing the amount of time between the initiation of a fault and its detection and location. Smart Grid Report at 38-39. A cost/benefit analysis was provided in confidential Attachment B. Staff supports the Company's efforts in this area, and looks forward to the results of the pilot project currently underway in the Rocky Mountain Power area, and a future assessment of circuits in Oregon which may benefit from this technology.

Other Outage Management Tools – The report describes the Company's current outage management system, using Supervisory Control and Data Acquisition (SCADA) where available, and otherwise relying on customer notifications. Smart Grid Report at 28. It references PacifiCorp's integration of intelligent electronic devices (IEDs), but does not quantify their level of current use or planned expansions. The *Fault Detection, Isolation and Restoration (FDIR)*

program, also known as distribution automation, enables the utility to remotely reconfigure the distribution network in response to planned or unplanned outages. Smart Grid Report at 28. The report states that the Company has implemented a couple of projects using this technology, but that the technology has not matured. Because of that, and due to the significant investment required, PacifiCorp has decided to monitor developments in this area. Staff has no comment on this decision; however, it does recommend that in the next Smart Grid report, the Company provide an integrated view of all of its smart grid technology efforts with regard to the Distribution Management System, including the outage management.

Reliability Metrics - Staff recommends the Company incorporate metrics for reliability and potential savings into its longer term smart grid goals and objectives related to distribution management systems. These metrics include the System Average Interruption Frequency Index (SAIFI), the System Average Interruption Duration Index (SAIDI), and the Momentary Average Interruption Event Frequency Index (MAIFI). Staff referenced a baseline for these statistics in the Oregon Investor-owned Utilities Seven-Year Electric Service Reliability Statistics Summary for 2004 through 2010, dated February 2012.

Reporting Results - Staff requests more information about how results will be reported in terms of both format and timing based on specific milestones.

Stakeholder Involvement – Order No. 12-158 (B)(1)(b) requires that utilities provide the public with opportunities to contribute information and ideas on smart-grid investments and applications. PacifiCorp held a workshop and provided opportunity for comments on June 11, 2013. Staff believes this technically was sufficient to meet the requirement, however it does not meet the spirit of the requirement. Staff would like to see more regular stakeholder involvement earlier in the process.

Roadmap to the Smart Grid – PacifiCorp offered a roadmap with a potential timeline for implementation of a smart grid. Smart Grid Report, Figure 7, at 61. However, the roadmap is theoretical and lacks important implementation dates and project evaluation matrices which would allow stakeholders and the Company to track the smart grid implementation against prioritized activities and deadlines.

Staff Recommendations:

Staff offers the following recommendation related to the 2013 report:

1. Staff recommends the Commission accept PacifiCorp's current 2013 Smart Grid Report filing as having met the requirements of Order No. 12-158 established in UM 1460.

Staff offers the following suggestions to PacifiCorp for improving its next Smart Grid Report:

2. PacifiCorp should seek stakeholder involvement earlier in the process of preparing the next Smart Grid Report.
3. PacifiCorp should include a roadmap (with dates) that includes how PacifiCorp plans to systematically evaluate the myriad of smart grid options available to the Company. PacifiCorp should list and prioritize specific smart grid investments and provide a description of the path forward and how the work plan and any pilot projects will be organized in order to evaluate the smart grid projects.
4. PacifiCorp should 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.
5. PacifiCorp should provide in its future smart grid reports updates of its cost-benefit analysis of the implementation of the smart grid system, including cost-benefit analyses of the smart grid case components.

PROPOSED COMMISSION MOTION:

PacifiCorp's 2013 Smart Grid Report is accepted with Staff's recommendations.