

**PUBLIC UTILITY COMMISSION OF OREGON  
STAFF REPORT  
PUBLIC MEETING DATE: February 20, 2015**

REGULAR  CONSENT  EFFECTIVE DATE \_\_\_\_\_ N/A \_\_\_\_\_

DATE: January 21, 2015

TO: Public Utility Commission

FROM: Michael Breish<sup>MB</sup> and Paul Rossow<sup>PR</sup>

THROUGH: Jason Eisdorfer<sup>JE</sup> and Aster Adams<sup>AA</sup>

SUBJECT: IDAHO POWER COMPANY: (Docket No. UM 1675) Annual Smart Grid Report.

**STAFF RECOMMENDATION:**

Staff recommends the Commission accept Idaho Power Company's (IPC, Idaho Power, or Company) 2014 Smart Grid Report filing as having met the requirements of Order No. 12-158 established in Docket No. UM 1460. Staff proposes the recommendations described below for future Idaho Power Smart Grid Reports.

**DISCUSSION:**

***Background***

In 2012, the Commission issued Order No. 12-158 establishing smart grid policy goals and objectives, utility reporting requirements, and Commission guidelines for utility actions related to smart grid. Under Order No. 12-158, utilities were required to file an initial smart grid report that, at a minimum, included the following main elements:

1. Smart grid strategy, goals and objectives.
2. Status of smart grid projects, initiatives, and activities that are underway, results of implemented smart grid projects, and planned smart grid investments for next five years.
3. Smart grid opportunities the Company is considering for the next five years and any constraints.
4. Targeted evaluations pursuant to Commission-approved stakeholder recommendations.
5. Related activities.

Thereafter, utilities are required to file an annual smart grid report that, at a minimum, includes incremental additions and updates of all elements of the initial report.<sup>1</sup>

The Commission accepted Idaho Power's initial Smart Grid Report (the 2013 report) as having met the requirements of Order No. 12-158.<sup>2</sup> At the same time, the Commission adopted Staff's recommendations (but modifying Staff's recommendation related to time-of-day pricing) for Idaho Power's 2014 report.<sup>3</sup> The recommendations adopted by the Commission were for Idaho Power to:

- 1) circulate a draft version of future smart grid reports at the same time they solicit comments and prior to filing at the Commission;
- 2) in the next Smart Grid report, provide an update and timeline for current analysis of CVR [Conservation Voltage Reduction] and detail the criteria it will use to gauge success and expandability of CVR efforts; and
- 3) in the next Smart Grid Report, provide:
  - a. An update on the current Time of Day (TOD) pilot;
  - b. A timeline and specific criteria for how the [C]ompany will analyze critical peak pricing and seasonal pricing structure as potential options for IPC customers; and
  - c. Criteria for how the TOD pilot will be evaluated and what participant behavior modifications and revenue impact outcomes would lead to decisions to expand pilot or not.

As explained in more detail in this Staff report, Idaho Power generally complied with the recommendations in Order No. 13-481. And, Idaho Power's report is consistent with the Commission's reporting requirements outlined in Order No. 12-158.

### ***Staff review***

The standard of review utilized by Staff in its review of the utilities' initial Smart Grid Reports is set forth below. Staff employed this same standard in reviewing the Company's 2014 Smart Grid Report:

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<sup>1</sup> Order No. 12-158, page 4.

<sup>2</sup> Order No. 13-481.

<sup>3</sup> Order No. 13-481.

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.

### ***Smart grid report***

IPC refined the structure and layout of their 2014 Smart Grid Report to further align with the format outlined in Order No. 12-158. Revisions such as those found in Section III, "Future Smart Grid Investments," provided Staff a clearer and more accessible presentation of valuable information. Staff hopes that such efforts continue in future reports.

Replicating last year's outreach methods, and in accordance with Utility Reporting Requirement 1.b. in Order No. 12-158, the Company solicited stakeholder input to contribute and develop the report. Stakeholders included utilities, advocacy groups, and the public. IPC placed ads in the *Argus Observer* and *Hells Canyon Journal* newspapers and sent an email to all parties on the service list for Smart Grid Docket No. UM 1460; the Company's last general rate case Docket No. UE 233; IPC's integrated resource planning Docket No. LC 58; and IPC's 2013 Smart Grid Report Docket No. UM 1675. The Company did not receive any comments or suggestions as a result of the newspaper advertisements or email.

In the 2014 Smart Grid Report, the Company continues to clearly identify their Smart Grid strategy goals and objectives as delineated by the Commission's requirements regarding elements of annual reports, specifically requirement C.1. Smart-Grid Strategy, Goals, and Objectives.<sup>4</sup> Staff finds that the Company's Smart Grid vision and seven major smart grid characteristics stated by the Company are well aligned with the Commission's stated policy goals and objectives.

The 2014 Smart Grid Report includes the main elements required by the Commission's reporting requirements. The Report provides the status of current smart grid investments, including but not limited to enhancements to transmission network operations, substation and distribution network operations, customer information, demand side management, and net metering.<sup>5</sup> The Report includes planned

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<sup>4</sup> Order No. 12-158 at 5.

<sup>5</sup> Idaho Power Company's 2014 Smart Grid Report, pages 14-27 and Appendix A.

investments covering the same broad range of activities.<sup>6</sup> With respect to opportunities for Smart Grid-related activities and constraints, Idaho Power identifies its intent to investigate possible improvements to technologies used in employee-customer interactions (such as tablets wirelessly connected to the Idaho Power system), and describes improvements in personalized customer interactions with the company (e.g., energy use management).<sup>7</sup>

Finally, Idaho Power responds to the 2013 Commission recommendations in the “targeted evaluations” section of its report (discussed below), and provides an overview of related activities, such as cyber security.

Overall, Staff is pleased with the progress IPC is achieving in advancing the implementation of a smarter grid for its customers. Staff is satisfied that Idaho Power met the guidelines set forth in Commission Order No. 12-158.

### ***Summary of Party Comments***

The Citizens Utility Board (CUB) provided written comments on IPC’s 2014 Smart Grid Report. CUB states they are generally pleased with the Company’s work and their continued serious efforts in and subsequent updates on its smart grid projects and assessments of those projects. CUB echoes Staff’s commendation on IPC’s enhanced organization of the report, referring also to Section III, “Future Smart Grid Investments.”

CUB commends IPC on its initiatives related to attempts to maintain grid reliability like the warning system during thunderstorms and further renewable integration, such as IPC’s solar-powered parking lot program and its Renewable Integration Tool. CUB appreciates the Company’s outreach to customers, though CUB would like to see such efforts detailed by class and state in future reports. Finally, CUB recommends that IPC “provide details about the costs of the pilot projects and other programs outlined in the Smart Grid [R]eport in a similar method as PGE.”<sup>8</sup>

Staff is pleased to see both continued and expanded efforts in transmission network and operations. In addition to ongoing Transmission Situational Awareness efforts such as increased phasor measurement unit installation, monitoring, and software analysis, the new Peak Reliability Hosted Advanced Application and Grid Operator’s Monitoring & Control Assistant reflect IPC’s commitment to both Company and Commission goals,

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<sup>6</sup> Idaho Power Company’s 2014 Smart Grid Report, pages 29-45.

<sup>7</sup> Idaho Power Company’s 2014 Smart Grid Report, pages 46-47.

<sup>8</sup> See PGE’s 2014 Smart Grid Report, UM 1657, Appendix B: Research, Development & Demonstration Projects.

strategies, and objectives. Staff appreciates IPC's work in challenging areas such as Western Electricity Coordinating Council contingency modeling and data gathering related to Dynamic Line Rating Pilot in Hells Canyon area. Staff looks forward to results from these efforts and others that can enhance reliability and renewable integration.

Developments have occurred in various aspects in Substation and Distribution Network and Operations, including topics on which the Staff and Commission previously made recommendations. Staff appreciates the continued reporting of the A/C Cool Credit Program and Grid System Planning, and is pleased to see advances in the Geomagnetic Disturbance Study and Irrigation Load Control Pilot. Revisions to the online Account Manager tool for customers, now called "myAccount," are welcomed as they will make the tool more effective for customers; enhancements to features that benefit customers align well with Commission and Company goals.

### ***Idaho Power response to recommendations adopted in Order 12-158***

#### Circulate draft report

Regarding the recommendation that the Company circulate a draft version of the 2014 Smart Grid Report, the Company did so when disseminating notice. Though Staff finds that these efforts satisfy the Utility Reporting Requirement III.B.b,<sup>9</sup> additional efforts to engage the public would be beneficial. Staff discusses these efforts later in this memorandum.

#### Conservation Voltage Reduction

Having seen CVR efforts in the Company's 2011 IRP, Staff sought additional information on the program in its review of the Company's initial Smart Grid Report. Idaho Power informed Staff through the Company's data response that further CVR implementation had been discontinued due to a number of reasons including "[a]n inability to measure actual peak reduction and energy savings," and "[a]n inability to measure the actual customer voltage during peak load or abnormal system configuration."<sup>10</sup>

In response to IPC's announcement that it had discontinued its CVR study and implementation, Staff recommended that for IPC's 2014 Smart Grid Report, "IPC provide an update and schedule for current CVR projects and provide details about

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<sup>9</sup> "In formulating reports, the utility will provide the public with opportunities to contribute information and ideas on smart-grid investments and applications." Order No. 12-158, 4.

<sup>10</sup> Idaho Power's responses to Staff Data Requests No. 5 and 6 in proceeding UM 1675.

what criteria it will use to decide whether or not to move forward with additional CVR projects." The Commission adopted this recommendation.

Furthermore, the Commission directed Staff in its evaluation of all Smart Grid Reports,

to perform an independent analysis of the utility pilot programs, related research, and conclusions drawn regarding Conservation Voltage Reduction and Volt/Volt Ampere Reactive control programs to determine what is possible and what is not, and what is economic and what's not.<sup>11</sup>

Staff is pleased with IPC's reported progress on its renewed CVR efforts, which are encompassed in the Company's new program called "CVR Enhancements Project."

The goals of the new CVR pilot program, which began in early 2014 and is "expected to be complete mid-2016," are:

1. Validate energy savings associated with CVR using measured instead of modeled values.
2. Quantify the costs and benefits associated with implementing CVR.
3. Determine methods for expanding the CVR program to additional feeders.
4. Pilot methods for making Idaho Power's CVR program more dynamic.
5. Determine methods for ongoing measurement and validation of CVR effectiveness.<sup>12</sup>

IPC included a comprehensive project plan as an appendix that delineates numerous facets of the program, including overview, program goals, and staffing. Additionally, a timeline, in the form of milestones and deliverables, is provided, which is included as Appendix G. Within the section of Appendix G titled "Work Breakdown Structure," IPC outlines fifteen tasks and periodic milestones up to a final report to be published in the middle of 2016. Appendix G also includes criteria and methodologies that explain how IPC will evaluate and proceed with an expanded CVR program.<sup>13</sup>

Staff recommended in its 2013 report that "[t]he Company should also detail the criteria it will use to gauge success and expandability of CVR efforts."<sup>14</sup> The Work Breakdown Structure section of Appendix G indicates that IPC will conduct a cost benefit analysis in 2015 and 2016 to determine which transformers should be included in an enhanced

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<sup>11</sup> Order No. 13-481, pages 2-3.

<sup>12</sup> Idaho Power 2014 Smart Grid Report, Appendix G, page 3.

<sup>13</sup> Idaho Power 2014 Smart Grid Report, Appendix G, pages 4-8.

<sup>14</sup> Order 13-481, UM 1675, Appendix A, page 8.

CVR program and the roll-out of the program. (See task 12.0.)<sup>15</sup> Tasks 3, 4 and 10, all relate to data analysis methodology, collection, and actual analysis and will contribute to the analysis identified in task 12.<sup>16</sup> Staff looks forward to seeing the results of these tasks, which will hopefully allow the pilot program to successfully transition to full-scale utility implementation. Staff will seek an update from the Company on the status of the CVR Enhancement Project in the fall of 2015.

Additionally, the possibility that a CVR program could be integrated into the Company's Automated Volt/VAr Management System (VVMS) is supported by Staff. The VVMS pilot flattens the voltage profile along the feeder, thus allowing a stable voltage at customers' premises while also reducing feeder losses. If successfully implemented, customers can experience a reduction in energy use thus saving customers money.

In its initial comments, Staff requested estimated or actual costs of the CVR program. IPC, in its reply comments, provided estimated costs of the CVR pilot program:

Labor	\$157,000
Material	82,000
Contingency	24,000
<b>Total</b>	<b>\$263,000</b>

Staff finds that the quantity and quality of information provided by IPC in regard to its CVR pilot program satisfy the recommendation in Order No. 13-481. In the 2015 Smart Grid Report, Staff looks forward to reviewing IPC's process and subsequent results for the following, which are included in the Work Breakdown Structure section of

#### Appendix G:

- Task 5 (Evaluate and select method to enhance CVR cost effectiveness),
- The milestone related to data collection and pilot devices, and
- Any preliminary data and conclusions that may be available related to Tasks 6-9.<sup>17</sup>

Finally, the Commission ordered in Order No. 14-253 in Docket No. LC 58 that Staff conduct the analysis of IPC's CVR program within the next six months and report the

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<sup>15</sup> Idaho Power 2014 Smart Grid Report, Appendix G, page 7.

<sup>16</sup> Idaho Power 2014 Smart Grid Report, Appendix G, pages 5-7.

<sup>17</sup> Idaho Power 2014 Smart Grid Report, Appendix G, pages 4-7.

results of the analysis to Staff at a public meeting.<sup>18</sup> Given that the final results of this pilot program will not be available until mid-2016, Staff recommends that the analysis requested from Staff be postponed until later in 2016.<sup>19</sup>

### Pricing Pilot Plans

In Order No. 13-481, the Commission recommended that Idaho Power provide in the 2014 Smart Grid report:

- a. An update on the current Time of Day (TOD) pilot;
- b. A time line and specific criteria for how the [C]ompany will analyze critical peak pricing and seasonal pricing structure as potential options for IPC customers; and
- c. Criteria for how the TOD pilot will be evaluated and what participant behavior modifications and revenue impact outcomes would lead to decisions to expand the pilot or not.

Below are Staff's analyses of IPC's response to each component of that request in addition to updates to each pricing pilot.

### An update on the current TOD pilot

IPC concluded the final behavior impact study of the residential TOD program in July 2014. The study was over a 12-month period and used a "quasi-experimental design structure" that consisted of a control and treatment groups. Idaho Power narrowed the study sample to 132,077 residential customers, to whom they sent offer letters to participate in the program. Idaho Power estimates only 1.3 percent were successfully recruited.<sup>20</sup> The control group consisted of customers who satisfied certain criteria to align them with treatment group customers: zip code, study quadrant, and peak vs. off peak usage in the pre-treatment period.

Key findings are listed below:

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<sup>18</sup> Order No. 14-253, page 16.

<sup>19</sup> Recently, in Portland General Electric (PGE)'s 2014 Smart Grid Report the Commission ordered PGE to report to the Commission in the first quarter of 2015 its findings from its CVR pilot program and PGE's next steps for expansion of the program (Docket No. UM 1657, Order No. 14-333, page 1).

<sup>20</sup> The study sample consisted of four groups based on seasonal electricity usage: low summer/low winter, low summer/high winter, high summer/low winter, and high summer/high winter. The respective numbers of participants were 211, 243, 364, and 525.



- The overall response rate to the residential TOD pricing pilot plan solicitation was 1.3 percent.
- A reduction in energy use during peak time periods occurred for the treatment group; the combined reduction for the treatment group was approximately three percent of total kWh used by both groups over the 12-month period.
- An increase in energy use during off-peak time periods occurred for the treatment group; the combined increase for the treatment group was approximately one percent of total kWh used by both groups over the 12-month period.
- 4,000 additional customers would likely volunteer to participate in the TOD program if the pilot was expanded to all residential customers in the Company's service territory.

IPC found "there was no statistically significant change in overall energy consumption observed in the study participants on the TOD rates." Importantly, the study estimated a revenue reduction of \$119,000, which equates to an energy billing revenue loss of 5.48 percent, when the treatment group's bills were compared to those of the control group.

Staff appreciates the inclusion of the *Time of Day Final Study Report* that provided clear analysis of the data and the thoroughness of the presentation of data. From the information provided, Staff is concerned that outreach to IPC customers is insufficient. If a TOD plan is introduced to IPC's Oregon customers, Staff hopes that those customers would have access to adequate material to fully inform them of the benefits of a TOD program. Staff is interested to know if greater education about TOD pricing plans as well as larger marketing efforts will lead to increased participation.

In future reports, Staff would like to see further analysis on how IPC is reaching out to customers about TOD programs and whether or not there is room for improvement.

**A timeline and specific criteria for analysis of critical peak pricing and seasonal pricing structure as potential options for IPC customers**

IPC responded to this recommendation in Section V, "Targeted Evaluations." The Company states that because it views critical peak pricing rate plans as a form of demand response (DR) that secures capacity from customers, its value materializes when a need for peaking resources arises. Idaho Power states that due to the existing Irrigation Peak Rewards, A/C Cool Credit and Flex Peak Management programs, which in total provide 391 megawatts of available DR, there is no present need for additional capacity from programs like critical peak pricing rate plans. However, IPC states that the

Company will continue to monitor future needs for additional capacity and will evaluate whether critical peak pricing rate plans can fulfill that potential deficit.

In its reply comments, IPC addressed Staff's request for an explicit timeline for critical peak pricing plans. The Company explained the inherent tie that capacity planning has to its IRP planning process, which recently demonstrated a capacity deficit will not occur until 2021.<sup>21</sup> Within its reply comments IPC also outlined a high level process for analyzing and implementing a critical peak pricing plan.<sup>22</sup> Staff appreciates the Company's effort in addressing Staff's queries and looks forward to seeing analyses in ensuing IRPs that demonstrate IPC's utilization of all available resources in addressing capacity shortfalls.

In regard to seasonal pricing plans, IPC explained that such plans are available to all Idaho customers, but not so to Oregon customers, though IPC has proposed such plans in its two previous rate cases.<sup>23</sup> In its reply comments, IPC stated "Oregon has been more reluctant to adopt [TOD and seasonal pricing] structures," but still anticipates that the Company "will again propose mandatory seasonal pricing for its residential customers in Oregon in its next general rate case filing." IPC believes that before more sophisticated TOD or critical peak pricing plans are introduced, seasonal pricing for all residential customers must be established.

Staff encourages the Company's efforts toward implementing alternative pricing plans for its customers.

**Criteria for evaluation of the TOD pilot and participant behavior modifications and revenue impact outcomes.**

IPC referred to its final behavioral study in its response to this component of the recommendation. IPC stated that "Idaho Power is considering offering an optional residential TOD rate plan to its Oregon service area customers."<sup>24</sup> Staff asked in its initial comments that IPC elaborate on "system barriers or implementation issues," which were listed as obstacles to offering the plan to Oregon customers in its 2014 Smart Grid Report.

In its reply comments, IPC provided the following implementation barriers that it believes must be resolved before Oregon customers can be offered optional TOD pricing:

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<sup>21</sup> 2016, but now 2021 because of DR programs.

<sup>22</sup> Idaho Power's 2014 Smart Grid Report Reply Comments, page 2-3.

<sup>23</sup> UE 213 and UE 233.

<sup>24</sup> Idaho Power 2014 Smart Grid Report, page 53.

- Filing a new rate schedule;
- Evaluating ways to mitigate loss of revenue requirement;
- Updated Customer Relations and Billing system to accommodate TOD plan;
- Coding of Automated Metering Infrastructure data to combine usage in the correct time blocks or pricing periods; and
- Update website to offer Oregon customers a rate comparison model.

Staff appreciates the explanation of obstacles and understands these are legitimate issues in implementing a cost-effective TOD program. As IPC stated, determining how revenue requirement losses can be mitigated is a crucial step in additional implementation of TOD pricing plans. Staff would like to see all research and analyses that IPC is devoting to finding solutions to this critical obstacle. For that reason, Staff recommends that IPC report on the progress of its evaluation and solutions to these obstacles in the 2015 Smart Grid report.

### ***Staff Recommendations***

Staff recommends the Commission accept Idaho Power's 2014 Smart Grid report as having met the requirements of Order No. 12-158. Staff also recommends the Commission accept the following recommendations:

- 1) IPC provide a summarizing table of all research, development, and pilot projects, their respective descriptions, expected benefits and costs in future Smart Grid reports.
- 2) IPC report on the progress of its evaluation and solutions to the obstacles to the implementation of the TOD pricing plans in the 2015 Smart Grid report.
- 3) IPC quantify the benefits expected from all Smart Grid programs and identify when the benefits will flow to its customers.

### **PROPOSED COMMISSION MOTION:**

Idaho Power's 2014 Smart Grid Report be accepted with Staff's recommendations.