



Portland General Electric Company
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May 30, 2014

Via Email/U.S. Mail

Filing Center
Electric and Natural Gas Division
Public Utility Commission of Oregon
3930 Fairview Industrial Dr., SE
Salem, Oregon 97302-1166

RE: Critical Peak Pricing (CPP) Pilot Report

Attention Filing Center:

In accordance with Commission Order No. 14-152, enclosed are three copies of PGE's final report on the Critical Peak Pricing (CPP) pilot. Also enclosed are three copies of attachments in support of the report.

Attachment A is confidential and subject to the terms and conditions of OAR 860-001-0070 and is provided in electronic format (CD) only and sent under separate cover. Attachments B-F are provided in electronic format (CD) only due to the size of the files and sent by U.S. Mail.

If you have any questions or require further information, please call Alex Tooman at (503) 464-7623. Please direct all formal correspondence and requests to the following email address: pge.opuc.filings@pgn.com.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patrick G. Hager", is written over the printed name.

Patrick G. Hager
Manager, Regulatory Affairs

PGH:sp

cc: Juliet Johnson, OPUC
Alex Tooman
Joe Keller
Colin Wright

PGE Report on Critical Peak Pricing Pilot

Introduction

Commission Order No. 09-395 (Docket No. UM 1427) approved PGE's Residential Critical Peak Pricing (CPP) pilot program and adopted certain conditions as part of that approval. These conditions direct PGE to "file reports on the CPP pilot no later than six months after each of the first and second year of the two-year pilot." The reports are to include:

- 1) Incremental program costs associated with setting-up and conducting the CPP pilot program;
- 2) Estimation of costs avoided by the Company resulting from usage changes;
- 3) Analysis of any difference in revenues collected under Schedule 12 as compared with what would have been collected under Schedule 7; and
- 4) Projected cost/benefits associated with a large scale implementation of a residential CPP program.

The CPP pilot was expected to be online at the end of 2010. PGE, being unable to meet that schedule, petitioned to withdraw its pilot program. The petition was granted, effective September 22, 2010 on the condition that PGE would work with Staff and other interested parties to reformulate the Residential CPP pilot program. On June 7, 2011, the Commission approved PGE's request to reinstitute the Residential CPP pilot program (Advice No. 11-10). PGE successfully implemented the pilot beginning November 2011 through October 2013. PGE submits this report based on the pilot's four operating seasons – Winter 1 (December 2011 through February 2012), Summer 1 (July 2012 through September 2012), Winter 2 (December 2012 through February 2013), and Summer 2 (July 2013 through September 2013).

Third-Party Evaluation

The primary component of the CPP report is provided as confidential Attachment A, which is a detailed third-party evaluation. Attachment A was prepared by DNV GL (formerly KEMA, Inc.) and consists of two aspects: 1) survey-based research, conducted separately for all Winter and Summer seasons; and 2) load shape and load impacts estimation, based on analysis of smart meter and load research sample data, also conducted separately for each of the four seasons. In summary, the DNV GL Report notes that the pilot did realize significant load reductions for the comparable event days.¹

DNV GL also evaluated customer satisfaction with the program and identified several significant aspects:

¹ Based on data available, DNV GL was able to derive results for all eleven winter events but only three of nine summer events. Consequently, the curtailment results cited in this report refer primarily to the winter seasons.

- The primary reason customers participated in the pilot was to save money.
- The pilot experienced attrition during both years of operation, with the number of participants dropping from approximately 1,000 customers to 544 at the end of the program. DNV GL notes that nearly 30% of the total dropouts left the pilot for reasons not related to satisfaction with the program, i.e., they automatically terminated participation when they moved. The primary reasons that customers dropped out of the pilot were:
 - Their electric bill went up after joining program;
 - Difficulty in being able to shift/reduce load; and
 - Didn't see any advantages to continued participation in the program.
- Overall customer satisfaction was approximately 60%.

Attachment A is confidential and subject to the terms and conditions of OAR 860-001-0070.

Other Reporting Requirements

In addition to Attachment A, PGE provides the following information in response to the reporting requirements listed above.

1) Incremental program costs associated with setting-up and conducting the CPP pilot program
PGE's incremental cost to implement the CPP pilot was approximately \$652,000. This amount consists of approximately \$474,000 for capital and \$178,000 for development O&M. In addition, PGE has incurred approximately \$290,000 in operating costs, which represent on-going O&M through April 2014. Finally, we have incurred approximately \$161,000 for two studies to evaluate the pilot through all of its operating seasons. Attachment B provides additional details of the pilot's costs.

2) Estimation of costs avoided by the Company resulting from usage changes

Because CPP represents a non-firm, capacity resource, we estimate the avoided capacity cost based on the one-hour, maximum kW curtailment (as estimated by DNV GL) times the avoided cost of a least-cost, supply-side resource (on a kW-year basis and discounted by 50% as noted in the Section 4, cost/benefit analysis, below). Based on these assumptions, the avoided capacity cost for the four operating seasons of the CPP pilot is approximately \$12,600 (average per event – see Attachment C, “Summary” tab). The avoided energy cost during the CPP event hours totals \$253.71 and is based on the kWh curtailments multiplied times the corresponding PowerDex Index price for those hours (details provided in Attachment D).

3) *Analysis of any difference in revenues collected under Schedule 12 as compared with what would have been collected under Schedule 7*

Overall, customers saved \$11,886 on Schedule 12 compared to what they would have been billed under standard Schedule 7 prices. Customers that stayed on Schedule 12 for the entire pilot saved \$0.86 per month on average. Customers that stayed on Schedule 12 for the first year saved \$0.71 per month on average, while customers that continued through the second year saved \$1.05 per month on average. A seasonal differentiation is apparent in customer savings for the first year of the pilot. Customers that stayed on Schedule 12 for the entire first winter saved \$1.45 per month on average. However, customers that stayed on Schedule 12 for the entire first summer paid an average of \$0.19 more per month than they would have on Schedule 7. In the second year, customers that stayed on Schedule 12 saved an average of \$1.64 per month for the second winter and \$0.39 per month for the second summer. A more detailed summary of the impacts to customer bills may be found in Attachment E.

4) *Projected cost/benefits associated with a large scale implementation of a residential CPP program.*

Costs

PGE provided a detailed estimate of the costs needed to develop a fully scalable CPP program in the first report on the pilot dated March 29, 2013. Because none of the conditions related to that estimate have changed, we did not update that estimate for this report. To repeat, the majority of the costs required to develop a fully scalable CPP program relate to systems PGE is currently preparing for replacement. Until new systems are in place, PGE continues to estimate the cost at approximately \$6.1 million, with a potential range of \$5 million to \$8 million. The \$6.1 million estimate consists of the following components:

- \$3.4 million in Informational Technology (IT) on PGE's existing customer information system (CIS) which is currently scheduled for replacement by 2017 as part of PGE's Customer Engagement Transformation program (CET).² This effort consists of software design, development, and testing and would require approximately 25,700 person-hours to complete. This effort is significant because of the need to configure PGE's current customer information system (CIS) and automate numerous processes for enrollment, customer communications, event dispatch, meter configuration, etc. that are currently manual during the pilot period.
- \$1.0 million for the redesign of the current meter data consolidator (MDC), which is also targeted for replacement in 2017 as part of the CET program. The redesign would be

² Docket No. UE 262, PGE Exhibit 900, Section III; and Docket No. UE 283, PGE Exhibit 1000, Section IV, provide a description and update of PGE's Customer Engagement Transformation program.

necessary to address the additional data storage and processing capacity needed for a large increase in 15-minute interval data.

- \$1.7 million for development O&M to: prepare customer communication documents, develop and deliver program training, develop back-office rules and validation for CIS, develop program management tools, etc.

As PGE continues preparation for a new CIS and MDC, programs such as CPP are being considered and planned for in recognition of the key role pricing options play in our customers' energy future.³ As noted below, PGE expects the cost to implement a CPP program after the new systems are in place to be significantly lower than with the existing systems.

In addition to the development costs, PGE projects that the CPP program would require the following on-going O&M:

- Years one and two would require approximately \$1.2 million to initiate the program, and
- Years three and after would require:
 - Approximately \$0.15 million annually to continue to run the program at the assumed low level of customer participation;
 - Approximately \$0.5 million annually to continue to run the program at the assumed nominal level of customer participation; and
 - Approximately \$1.0 million annually to continue to run the program at the assumed high level of customer participation.

Attachment F provides work papers summarizing the cost components. PGE projects that with existing systems, it would require at least two years to implement a fully-scalable CPP program based on: 1) the cost and complexity of these efforts; 2) the current allocation and availability of IT resources; and 3) the need to better inform customers about CPP pricing in order to achieve adequate participation levels.

Cost/Benefit Analysis

With the costs identified above, PGE used a cost/benefit model previously employed in the UE 189 Docket, which related to PGE's advanced metering infrastructure system (AMI – approved by Commission Order No. 08-245). As part of that proceeding PGE submitted Exhibit 103, the Scoping Plan of Customer and System Benefits. Within that plan and analysis, PGE evaluated the net benefits of a hypothetical, opt-in CPP program with a range of possible participation levels. Attachment C of this report provides that same model with updated cost information and benefits as estimated from: 1) the DNV GL study; and 2) the avoided cost of a

³ This will be discussed in greater detail in PGE's Smart Grid Report that will be filed by June 1, 2014, in accordance with Commission order No. 12-158.

least-cost, supply-side resource.⁴ Because CPP represents a non-firm resource with day-ahead notice, it delivers less benefit than a firm resource that can respond within 10 minutes. Consequently, PGE discounted the avoided capacity cost of the supply-side resource by 50%.

Based on the updated scoping plan, participation levels of 1.5%, 5%, and 10% (by the fifth year of the program) result in a net present value (NPV) cost for CPP over a 20 year program life.⁵ The use of a 20-year program life, however, is arguably inappropriate because the installation of a new CIS and MDC in 2017 would establish a new basis on which to associate the CPP benefits. This occurs because the costs estimated above relate to the existing CIS and MDC, which would not carry forward to the new systems.

This means that the cost to implement a CPP program after 2017 would be significantly less than with the current systems. An additional cost, however, relates to the need to better inform customers so they are more receptive to CPP and more likely to participate than at the level realized in the pilot (i.e., approximately 1.4% prior to attrition). This effort will be necessary for any fully scalable program and PGE is currently researching customer education as part of our strategic pricing roadmap. Because PGE does not yet have an estimate of these costs, we have not included them in Attachments C or F.

Although PGE might consider enabling technology in future CPP pilots, we did not include an estimate of enabling technology with this cost/benefit analysis due to:

- The estimated installed cost per programmable communicating thermostat (PCT) is between \$400 and \$600.
- The low level of interest in PCTs by customers in the current CPP pilot, as identified in the DNV GL study.⁶
- The high level of participation needed to achieve a net present value benefit given the estimated costs for program development absent enabling technology.

Conclusions and Recommendations

PGE believes there are three conclusions to draw from the information in this report:

- Although most load reductions were observed in the winter season, the curtailment results indicate that CPP has potential for peak curtailment in PGE's service territory.

⁴ PGE used the least-cost, supply-side resource included in our 2013 IRP.

⁵ The NPV estimates are based on the \$6.1 million cost estimate for CPP program development. As noted above, this cost could range from \$5 million to \$8 million with corresponding changes in NPV results.

⁶ DNV GL used survey research from program participants and dropouts to identify interest in Smart Thermostats and other home energy display devices.

- The pilot's participation and attrition rates demonstrate that significant customer education will be required before substantial, on-going participation can be expected from PGE's customers in a CPP program.
- PGE's cost/benefit estimates signify that it is not cost-effective to implement a fully-scalable CPP program with PGE's existing CIS and MDC systems.

Furthermore, PGE gained valuable insight to improve future programs:

- The CPP program started near the beginning of the winter season making it more difficult for participants to adjust to a time-of-use rate structure. This likely led to greater attrition during the first winter season and rewarded participants with non-electric heat.
- Adjusting the applicable hours for critical peak events will better target winter peak loads.
- Adjusting the timing of events would address certain requirements for improved baseline calculations for the summer periods.
- Because the program demonstrated TOU effects, future programs should collect the pre-program data in order to quantify the impacts.
- Customers' ability to shift load is key to satisfaction with the program. Simplifying future programs, targeting successful customers, and increasing suggestions are critical to load shedding and overall satisfaction.

This will allow additional results to inform our decisions for future CPP-related activities.

Among these activities, PGE plans to:

- Identify CPP and time-of-use requirements for new systems and programs.
- Continue to monitor demand response programs and results from other utilities.
- Develop an education program to better inform customers regarding the purpose of, and how to effectively participate in, dynamic pricing options and demand-response programs.
- Evaluate and propose additional pilot alternatives that could help PGE develop a CPP program.
- Continue to implement PGE's CET program in which we will replace the current CIS and MDC. This will create the platforms on which a more cost-effective, fully scalable CPP program can be developed along with the other benefits discussed in PGE Exhibit 1000 in Docket No. UE 283.

In the near term, PGE will continue to work with the OPUC Staff and other interested parties to determine the next appropriate steps regarding CPP. In this regard, we plan to consider all

dynamic pricing options and their costs/benefits in order to implement the programs that make the most sense for customers.

CPP Report

Attachment A

**Confidential and subject to the terms and
conditions of OAR 860-001-0070**

Provided in Electronic Format (CD) only

DNV GL

Pilot Evaluation Report (2011 - 2013)

CPP Report

Attachment B

Provided in Electronic Format (CD) only

Incremental Pilot Costs

CPP Report

Attachment C

Provided in Electronic Format (CD) only

Estimated Cost/Benefit Analysis for Fully Scalable CPP Program

CPP Report

Attachment D

Provided in Electronic Format (CD) only

Estimated Impact of CPP Pilot

CPP Report

Attachment E

Provided in Electronic Format (CD) only

Difference in Revenues
Schedule 12 vs. Schedule

CPP Report

Attachment F

Provided in Electronic Format (CD) only

Estimated Cost of Fully Scalable CPP Program