

STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

COMMONWEALTH EDISON COMPANY :
 :
Petition for approval of tariffs implementing : No. 12-0484
ComEd's proposed peak time rebate program :

Phase 3 Direct Testimony of
JAMES C. EBER
Manager,
Demand Response & Dynamic Pricing
Commonwealth Edison Company

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1 **I. EXECUTIVE SUMMARY AND INTRODUCTION**

2 **A. Witness Identification**

3 **Q. Please state your names and business addresses.**

4 A. My name is James C. Eber. My business address is 3 Lincoln Centre, Oakbrook Terrace,
5 Illinois.

6 **Q. Are you the same James C. Eber who previously testified in this docket?**

7 A. Yes. In the initial phase of this docket, I submitted direct testimony (ComEd Exhibit
8 (“Ex.”) 2.0), supplemental direct testimony (ComEd Ex. 4.0), and rebuttal testimony
9 (ComEd Ex. 6.0). In the second phase of this docket I submitted direct testimony
10 (ComEd Ex. 8.0) and rebuttal testimony (ComEd Ex. 9.0). My background, professional
11 qualifications, duties, and responsibilities remain unchanged.

12 **B. Purpose of Direct Testimony**

13 **Q. What are the purposes of your Phase 3 direct testimony?**

14 A. The Second Interim Order entered by the Illinois Commerce Commission
15 (“Commission”) in the instant proceeding on July 30, 2014 (“Second Interim Order”)
16 directed Commonwealth Edison Company (“ComEd”) to:

- 17 • Prepare and file an analysis of the results of the Direct Load Control (“DLC”)
18 pilot program offered under Rider PTR – Peak Time Rebate (“Rider PTR”) in the
19 instant proceeding by December 31, 2015.
- 20 • Provide Staff of the Commission (“Staff”) and intervenors an opportunity to
21 comment on the report before it is filed and consider such comments and make
22 any appropriate revisions.

- 23 • File testimony regarding the evaluation report and whether or not to modify Rider
24 PTR to include DLC technology for participants taking service under the rider
25 based on the results of the DLC Pilot on or before April 1, 2016.

26 The load curtailment program provided under Rider PTR has been named Peak
27 Time Savings (“PTS”); thus, the term PTS will be used throughout my testimony. The
28 purposes of my Phase 3 direct testimony are to describe the preparation and filing of the
29 PTS DLC evaluation report (“PTS DLC Evaluation Report” or “DLC Report”), provide
30 an overview of the DLC Report, and to make a recommendation to the Commission as to
31 whether or not to direct ComEd to modify Rider PTR to include DLC technology for PTS
32 participants based on the results of the DLC Report.

33 Q. **Have you provided any attachments to your Phase 3 direct testimony?**

34 A. Yes. ComEd Ex. 10.01 is a copy of the PTS DLC Evaluation Report filed on
35 December 30, 2015.

36 **C. Summary of Conclusions**

37 Q. **What are the conclusions of your testimony?**

38 A. I conclude that based on recent filings and this testimony, ComEd has complied with the
39 Commission directives as specified in the Second Interim Order; specifically, that
40 ComEd prepare and file the PTS DLC Evaluation Report and that ComEd make a
41 recommendation to the Commission regarding whether to modify Rider PTR to include a
42 DLC technology offer to PTS participants. Based on the analyses and results shown in
43 the PTS DLC Evaluation Report, including available DLC cost and benefit data, I
44 conclude that it is not cost effective to offer free or discounted DLC technology and free
45 installations of DLC technology as part of the PTS program at this time.

46 **II. PTS DLC EVALUATION REPORT**

47 **A. Preparation and Filing of the Report**

48 **Q. Did ComEd file the PTS DLC Evaluation Report in the instant proceeding by**
49 **December 31, 2015?**

50 A. Yes. ComEd filed the report in the instant proceeding on December 30, 2015, a copy of
51 which is attached hereto as ComEd Ex. 10.01.

52 **Q. What action did the Commission direct ComEd to take regarding the filing of the**
53 **PTS DLC Evaluation Report?**

54 A. The Commission directed that “Staff and intervenors shall be provided an opportunity to
55 comment on the report before it is filed in the instant proceeding. ComEd’s third party
56 evaluator shall consider such comments and make any revisions the evaluator deems
57 appropriate.” Second Interim Order at 15.

58 **Q. Did ComEd provide Staff and intervenors an opportunity to comment on the**
59 **report?**

60 A. Yes. ComEd provided a draft report to the parties in the instant proceeding on
61 November 25, 2015, and held a workshop on December 7, 2015 for the parties to discuss
62 the report at the Chicago office of the Commission. ComEd then responded to follow-up
63 questions from parties.

64 **Q. Was any comment proffered by the parties on the report?**

65 A. Yes. In the workshop and follow-up discussions, some parties suggested that the
66 appropriate period for the cost and benefit analysis should begin in 2017 instead of 2015,
67 as assumed in the draft analysis presented to the parties. ComEd understood the

68 reasoning for this proposed change was that if the Commission decided to direct ComEd
69 to offer DLC to PTS participants, the implementation of DLC would not begin until
70 2017.

71 Q. **Does the cost and benefit analysis in the PTS DLC Evaluation Report filed on**
72 **December 30, 2015 reflect 2017 as the starting year?**

73 A. Yes.

74 **B. Overview of the Report**

75 Q. **What information is included in the PTS DLC Evaluation Report?**

76 A. The report includes a description of the PTS DLC pilot design and its implementation,
77 the amount of load reduction achieved during curtailment events called during the
78 summer of 2015, a cost and benefit analysis, a sensitivity analysis of the key inputs to the
79 cost and benefit analysis, and a survey of participants regarding the pilot program. The
80 report provides information on whether offering enabling technology increased PTS
81 enrollment rates, whether the presence of enabling technology increased the load
82 reductions for PTS participants, whether the incremental benefits of the technology offset
83 its costs, and whether the offer of technology increased customer satisfaction.

84 Q. **What was the PTS DLC pilot design?**

85 A. The pilot design is summarized in Table 1-1: Treatment Groups for DLC Pilot. ComEd
86 Ex. 10.01 at 5. The pilot design included five customer groups in the pilot program
87 reflecting whether customers were single family (“SF”) with central air conditioning
88 (“AC”) or multi-family (“MF”) with window AC, and whether customers were offered an
89 AC switch/plug in device, a Programmable Communicating Thermostat (“PCT”), or no

90 DLC technology. There were A and B sub-groups in each customer group. Customers in
91 the sub-groups participated in alternate curtailment events to provide a control group and
92 allow a direct measure of the effect of the DLC technology over and above the load
93 reductions that would be obtained from PTS without DLC technology. There was also a
94 sub-group C in the SF central AC switch group that participated in all curtailment events.
95 This pilot design was consistent with the pilot design described in my Phase 2 direct
96 testimony (ComEd Exs. 8.0 and 8.01), with modifications as suggested by Staff (Staff
97 Ex. 5.0), and accepted by the Commission. Second Interim Order at 14-15.

98 **Q. How did ComEd implement the pilot design?**

99 A. The implementation of the pilot design is summarized in Figure 1-1: Summary of Offer
100 Acceptance Rates and Figure 3-1 of the same title. ComEd Ex. 10.01 at 7 and 32.
101 ComEd began sending marketing materials regarding the PTS DLC pilot program to
102 customers with Advanced Metering Infrastructure (“AMI”) meters in October 2014. The
103 original marketing plan called for sending direct mailings to 50,000 customers; 10,000 to
104 each of the five groups. ComEd Ex. 8.01 at 27. Due to lower than expected acceptance
105 rates in the first two direct mailings, ComEd conducted additional marketing and on an
106 overall basis sent marketing materials to approximately 165,000 customers in seven
107 direct mailings. ComEd also conducted two email marketing campaigns. ComEd
108 Ex. 10.01 at 19.

109 Ultimately, ComEd contacted about 168,200 customers. Of these customers,
110 about 98,600 were SF and about 69,600 were MF. The SF customers were randomly
111 assigned to three groups: PTS only, PTS with AC switch, and PTS with PCT. The MF
112 customers were randomly assigned to two groups: PTS only and PTS with plug-in AC

113 device. ComEd sent customers marketing materials about the PTS program and invited
114 customers to participate in the PTS program. For the customers in the technology groups,
115 ComEd sent information offering AC switches (group 2) or PCTs (group 3) to SF
116 customers with central AC, and offering plug-in devices to MF customers with window
117 AC (group 5). *Id.*, Appendix A.

118 **Q. What percentage of customers receiving the marketing materials regarding**
119 **participating in the PTS DLC pilot program accepted the offer?**

120 A. The percentages of customers that responded to ComEd and expressed interest in
121 participating in the pilot programs (i.e., the acceptance rates) are: 4.0% (SF with central
122 AC for PTS only), 4.1% (SF with central AC for PTS with AC switch), 3.9% (SF with
123 central AC for PTS with PCT), 5.0% (MF with window AC for PTS only), and 3.3% (MF
124 with window AC for PTS with plug-in device). The acceptance rates for customers in the
125 three SF with central AC groups are approximately the same, demonstrating that the
126 offering of technology has no impact on the acceptance rate. The research results also
127 show that the offering of DLC technology lowers the acceptance rate for MF customers
128 with window AC. The acceptance rates for customers in the two MF with window AC
129 groups are 5.0% for group 4 (PTS only) and 3.9% for group 5 (with plug-in device). This
130 result is statistically significant and thus reflects a real difference in customers'
131 willingness to enroll in the program with a technology offer.

132 **Q. Did all customers accept the offer to enroll in the PTS DLC pilot program?**

133 A. No. The customers who enrolled in the pilot program are the customers that accepted the
134 offer, met the eligibility requirements, and completed the pilot registration process.
135 Examples of the eligibility requirements include the ownership of central AC for groups

136 1, 2, and 3, and window AC for groups 4 and 5. The main reason that customers
137 accepted the offer but did not complete the pilot registration process is because they
138 changed their mind about having the DLC equipment or had technical or installation
139 issues with regards to the DLC equipment. ComEd Ex. 10.01 at 33-37. The final
140 numbers for customers that participated in the PTS DLC programs were: 973 (SF with
141 central AC for PTS only), 710 (SF with central AC for PTS with AC switch), 270 (SF
142 with central AC for PTS with PCT), 628 (MF with window AC for PTS only), and 92
143 (MF with window AC with a plug-in device).

144 **Q. What DLC equipment was provided to participants of the PTS DLC pilot program?**

145 A. Participants in the SF with central AC switch group were provided Comverge AC
146 switches with free installation. The AC switch device was programmed to cycle the AC
147 off for 50% of the time (i.e., up to 15 minutes every half hour) during a PTS event, and
148 customers were able to over-ride the control. Participants in the SF with central AC and
149 PCT group were offered a \$100 rebate and free installation for three Honeywell PCT
150 options. The PCT device was programmed to effectively cycle the AC off for 50% of the
151 time during a PTS event, and customers were able to over-ride the control. Participants
152 in the MF with window AC with technology group were provided ThinkEco smartAC
153 kits and, if requested by participants, free installation. The plug-in device was connected
154 to the internet and received signals to control the window AC during the PTS events.
155 Customers were able to over-ride the control. *Id.* at 20-22.

156 **Q. How many PTS events were called during the summer of 2015?**

157 A. There were six PTS events called during the summer of 2015, with the first event held on
158 July 23 and the last one held on September 2. Figure 1-2: Summary of Events Dates,

159 Sub-Group, and Dispatch Hours, and Table 2-7 of the same title, summarize the hours
160 when each event occurred and show which sub-groups were called for each event.
161 ComEd Ex. 10.01 at 7 and 30.

162 Q. **What were the average load reductions of the customers who participated in the**
163 **PTS DLC pilot program during the PTS events in the summer of 2015?**

164 A. Table 1-2: Average Load Reduction per Customer across All Event Hours, Table 4-1 of
165 the same title, and Table 4-2: Load Impacts for the Average Event by Hour, provide the
166 average loads, in kilowatts (“kW”), of the five groups of PTS DLC participants during
167 the PTS events in the summer of 2015 when the sub-groups were not called (Load
168 without Demand Response “DR”) versus when the sub-groups were called (Load with
169 DR). ComEd Ex. 10.01 at 8, 43, and 51. The difference of these two measures shows
170 average load reductions and average percentages of load reductions for the five groups.
171 For participants without DLC technology, the average percentage reductions were 8.9%
172 and 8.6%, respectively, for SF with central AC and MF with window AC groups. The
173 average percentage reduction for SF with central AC and PCT group is 23.9%, or 2.7
174 times the average percentage reduction of the SF with central AC but no technology
175 group. The average percentage reduction of MF with window AC and plug-in AC device
176 group is 20%, or 2.3 times the average percentage reduction of the MF with window AC
177 but no technology group.

178 I also note that none of the AC switches installed in the SF with central AC switch
179 group worked for any of the events in summer 2015. ComEd discovered this after the
180 summer was over. As a result, it is not possible to directly estimate the average load
181 reduction of the SF with central AC switch group, had the AC switches worked properly.

182 Because the PCTs were essentially programmed like an AC switch and also set to provide
183 50% cycling to the central AC, the average percentage load reduction result of the SF
184 with central AC and PCT group was used as an estimate of the average percentage load
185 reduction of the SF with central AC switch group.

186 **Q. Does the PTS DLC Evaluation Report include a cost and benefit analysis of offering**
187 **DLC to PTS participants?**

188 A. Yes. Section 5 of ComEd Ex. 10.01 provides a cost and benefit analysis of including
189 DLC in the PTS program based on the pilot findings. The inputs for the analysis are the
190 load impacts discussed previously in my Phase 3 direct testimony and the inputs
191 summarized in Tables 5-1: Cost Effectiveness Inputs and 5-2: Avoided Generation
192 Capacity Costs. *Id.* at 54-55. The cost effectiveness analysis was performed from two
193 perspectives: a total resource cost test (“TRC”) and the utility cost test (“UCT”). The
194 TRC test measures whether customers as a whole benefit from the program. Under the
195 TRC, any incentives provided to participants are considered transfer payments from non-
196 participants and not costs to utility customers as a whole. The UCT is from the
197 perspective of whether the benefits of the program are larger than the costs of providing
198 the program, and therefore put upward pressure on utility rates to recover the difference.
199 For UCT, any incentives provided to participants are considered a cost of the program for
200 the utility. The results of the TRC and UCT for the five groups are presented in Table 1-
201 3: Cost-Effectiveness of Customer-technology Combinations and Table 5-3 of the same
202 title. *Id.* at 9 and 56¹. In these two tables, benefits and costs are presented as an average

¹ Window AC is referred as room AC in these tables. These two terms are interchangeable in ComEd Ex. 10.01.

203 net present value (“NPV”) per participant for a program life of 15 years. The
204 Benefit/Cost Ratio is the ratio of benefits divided by the costs. A ratio of 1 or greater
205 indicates that the program is cost effective and a ratio of less than 1 indicates that the
206 program is not cost effective. The results based on the pilot analysis show that it is cost
207 effective from both TRC and UCT perspectives to offer the PTS program to the SF with
208 central AC with no technology group and not cost effective for the other four groups.

209 It is important to note that the analysis measured benefits solely from a demand
210 response perspective and does not reflect other benefits of customers having the devices.
211 For example, the cost and benefit analysis shown in ComEd Ex. 10.01 does not take into
212 account that customers with PCTs and plug-in devices are able to use the devices to
213 reduce the electricity usage of their AC and their electric bills all season long and not just
214 the savings from reductions during the PTS event hours. Likewise, the cost savings from
215 the reduction of electricity usage as a result of customers using PCTs and plug-in devices
216 for the cooling season are not included in the determination of the TRC and UCT test
217 values in the cost effective analysis shown in ComEd Ex. 10.01.

218 **Q. Does the PTS DLC Evaluation Report include a sensitivity analysis of the key inputs**
219 **to cost effectiveness?**

220 **A.** Yes. Section 5.4 of ComEd Ex. 10.01 provides the TRC results with a 20% increase or
221 decrease for key inputs: capacity costs, load impact, one time and recurring costs per
222 participant, discount rate, attribution rate, and device life. The SF with central AC with
223 no technology group is cost effective in all scenarios. If there is a 20% higher avoided
224 capacity costs, higher load impact, or a 20% lower one time per participant cost, the
225 Benefit/Cost Ratio of the SF central AC switch group becomes greater than 1, while the

226 Benefit/Cost Ratio for the SF with central AC and PCT group and the MF with window
227 AC with or without technology groups remain less than 1.

228 Q. **Does the PTS DLC Evaluation Report include a participant survey?**

229 A. Yes. A customer satisfaction survey of PTS DLC pilot participants was conducted from
230 October 23 to November 16 of 2015, and 339 participants completed the survey. An
231 important finding is that participants with DLC technology compared to participants
232 without DLC technology had significantly higher satisfaction with the PTS program
233 overall. With respect to customer satisfaction, the survey results show that 82% of
234 customers with DLC technology versus 71% of customers without DLC technology rated
235 8-10 on a 0-10 scale. The customers with DLC technology were also significantly more
236 likely to recommend the program to family and friends. The survey results show that
237 86% of customers with DLC technology versus 75% without DLC technology rated 8-10
238 on a 0-10 scale regarding the likelihood of recommending the program to others. *Id.* at
239 38-40.

240 Q. **What is the smart thermostat control program that ComEd recently filed with the**
241 **Commission?**

242 A. On March 25, 2016, ComEd filed with the Commission tariff revisions for offering smart
243 thermostat control programs for customers that participate in the PTS program and for
244 customers taking service under Rider AC – Residential Air Conditioner Load Cycling
245 Program (“Rider AC”), beginning with the summer of 2016. ComEd proposes to offer a
246 service to control the smart thermostats (i.e., the PCTs of customers when they participate
247 in the PTS and Rider AC programs). PCTs have grown in popularity in recent years and
248 customers may already own PCTs for reasons other than participating in these demand

249 response programs, such as to seek to reduce electricity usage during the cooling season
250 or to better control use automatically while they are away from the home. Additionally,
251 customers may obtain an authorized PCT through ComEd's energy efficiency program,
252 qualifying for a \$125 rebate. ComEd proposes to offer the smart thermostat control
253 program to PTS customers as a service due to the significant increase in load reduction
254 and the high customer satisfaction with the PTS program experienced by DLC Pilot
255 customers with DLC technology. If the Commission approves ComEd's smart
256 thermostat control program filing, customers that already own smart thermostats will be
257 able to participate in the PTS program with smart thermostat control in the summer of
258 2016.

259 **C. Conclusions Based on the Report**

260 **Q. What are your conclusions based on the findings of the PTS DLC Pilot Evaluation**
261 **Report?**

262 **A.** Although the PTS DLC Pilot Evaluation Report identified certain benefits associated
263 with offering DLC technology (including increased demand reduction with DLC
264 technology in the range of 2.3 to 2.7 times the load reduction with no technology), it also
265 showed that the cost of the technology would outweigh the benefits of the technology.
266 The two major benefits of offering DLC technology to PTS participants that would be
267 expected based on the DLC Report are the following:

- 268 • Participants with the technology offers would be more satisfied with
269 participating in the PTS program and more likely to recommend it to
270 family and friends than the participants without DLC technology.

271 • Participants with technology offers would increase the load reductions
272 during PTS events more than participants without DLC technology.

273 However, the cost-effectiveness analysis provided in the evaluation report
274 indicates that offering DLC technology is not cost-effective at this time based on current
275 costs, benefits, and demand reductions. The sensitivity analysis based on the PTS DLC
276 pilot results shows that, even with 20% higher benefits or 20% lower costs, only the SF
277 with central AC switch group is cost effective, while the SF with central AC and PCT
278 group and the MF with window AC and plug in device group remain cost ineffective.
279 For these reasons, I recommend that the Commission find that it is not cost effective to
280 include DLC technology for PTS participants, and that the PTS Program should not be
281 modified to include an offer of DLC technology at this time.

282 **III. CONCLUSION**

283 **Q. Does this conclude your testimony?**

284 **A. Yes.**