

STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

Illinois Commerce Commission	:	
On Its Own Motion	:	
	:	
v.	:	Docket No. 14-0384
	:	
COMMONWEALTH EDISON COMPANY	:	
	:	
Investigation of Commonwealth Edison	:	
Company's Cost of Service for Low-Use	:	
Customers in Each Residential Class	:	

Rebuttal Testimony of
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Manager
Regulatory Strategies and Solutions
Commonwealth Edison Company

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1 **I. INTRODUCTION**

2 **A. Witness Identification**

3 **Q. What is your name and prior participation in this docket?**

4 A. My name is Charles S. Tenorio. I am the Manager of Regulatory Strategies and
5 Solutions (“RSS”) at Commonwealth Edison Company (“ComEd”). I previously
6 submitted direct testimony in this docket. My background, professional qualifications,
7 duties, and responsibilities are unchanged from those described in that direct testimony.

8 **B. Summary of Rebuttal Testimony**

9 **Q. What is the purpose of your rebuttal testimony?**

10 A. I respond to a number of proposals and arguments made by the Illinois Commerce
11 Commission (“ICC” or “Commission”) Staff witness, Mr. William Johnson, the Illinois
12 Attorney General’s (“AG”) witness, Mr. Scott Rubin, and the Citizens Utility Board’s
13 (“CUB”) witness, Mr. Edward Bodmer, as they relate to cost assignment in ComEd’s
14 Embedded Cost of Service Study (“ECOSS”) and the development of charges in
15 ComEd’s rate design.

16 The Staff and other witnesses addressed several topics to which I respond. The
17 failure to address any particular point raised by any of those witnesses does not
18 necessarily reflect my agreement with that position.

19 **Q. What overall observations do you have regarding the other witnesses’ direct
20 testimonies?**

21 A. In my examination of the direct testimonies of the other parties’ witnesses, I made the
22 following overall observations:

- 23 • Generally, the parties do not support the implementation of low-use subgroups in
24 the residential delivery classes; and
- 25 • Parties generally support the use of Advanced Metering Infrastructure (“AMI”)
26 meter-usage data for cost allocation purposes when the data accurately represent
27 the billing determinants of ComEd’s customers.

28 **Q. Do you have any concerns with respect to the direct testimonies presented by the**
29 **other parties?**

30 A. Yes, I have concerns regarding the following considerations:

- 31 • AG witness Rubin’s analysis of the relationship between demand and energy;
- 32 • Various witnesses’ failure to recognize that ComEd cannot economically change
33 distribution facilities when customers decrease demand or energy usage; and
- 34 • CUB witness Bodmer’s recommendation to further segment embedded costs by
35 age and configuration of distribution facilities, as well as his mischaracterization
36 of points made in my direct testimony.

37 I address each concern in detail later in this rebuttal testimony.

38 **Q. Do the parties’ proposals and arguments change the assessments you presented in**
39 **your direct testimony?**

40 A. No. ComEd remains concerned that the implementation of residential subgroups may
41 cause customer confusion and dissatisfaction, and may not result in recognizable changes
42 on customers’ bills. Moreover, it is still important that any definition of low-use

43 customers must be manageable within the confines of ComEd's billing system, and
44 understandable by customers.

45 **C. Attachments to Rebuttal Testimony**

46 **Q. What exhibits are attached to your rebuttal testimony?**

47 A. ComEd Exhibit ("Ex.") 5.01 provides ICC Staff's response to ComEd data request 2.01.

48 **II. LOW-USE RESIDENTIAL SUBGROUPS**

49 **Q. Did any witness strongly support the implementation of low-use subgroups in the**
50 **residential delivery classes?**

51 A. No. The other parties' witnesses generally appear to recognize that while there are slight
52 differences in the load profiles and related cost allocation, those differences did not
53 warrant the creation of low-use residential subgroups. Specifically Staff witness
54 Mr. Johnson stated:

55 I question whether a grouping of low-use customers should be
56 implemented at this time using the methodologies offered by ComEd,
57 especially with the Company's concerns related to migration, customer
58 confusion, dissatisfaction, and that the movement to low-use subgroups
59 may not result in recognizable changes in bill impacts.

60 ICC Staff Ex. 1.0, 39:905-909.

61 More directly, Mr. Johnson clearly stated "No" when asked if he recommends the
62 implementation of a low-use residential subgroup. *Id.* at 37:846-47. Additionally, AG
63 witness Rubin concluded that it is not necessary for the Commission to create a separate
64 low-use residential class. AG Ex. 1.0, 36:679. CUB witness, Mr. Bodmer, appears to
65 support low-use residential subgroups if they are implemented in conjunction with his
66 vision of the evaluation of the age and configuration of ComEd's distribution equipment.

67 CUB Ex. 1.0, 13:239 – 15:269. I address concerns pertaining to such evaluations later in
68 this rebuttal testimony.

69 **Q. What recommendations were made on how to determine if a customer is eligible to**
70 **be in a low-use subgroup, in the event the Commission directs ComEd to implement**
71 **low-use subgroups in its residential delivery classes?**

72 A. Mr. Johnson found the Maximum Monthly Usage (“MMU”) method to be the most
73 reasonable of the three approaches presented in my direct testimony. Staff Ex. 1.0,
74 40:924-28. Additionally, Mr. Johnson recommends: “[t]o reduce some of the migration
75 and confusion issues I recommend that customers stay in their classes for a twelve month
76 [*sic*] period, then each customer would be reevaluated on an annual basis.” *Id.* at
77 40:933-35. No other witness made a recommendation on this topic.

78 **Q. Should ComEd reevaluate low-use designations, as Mr. Johnson’s recommends?**

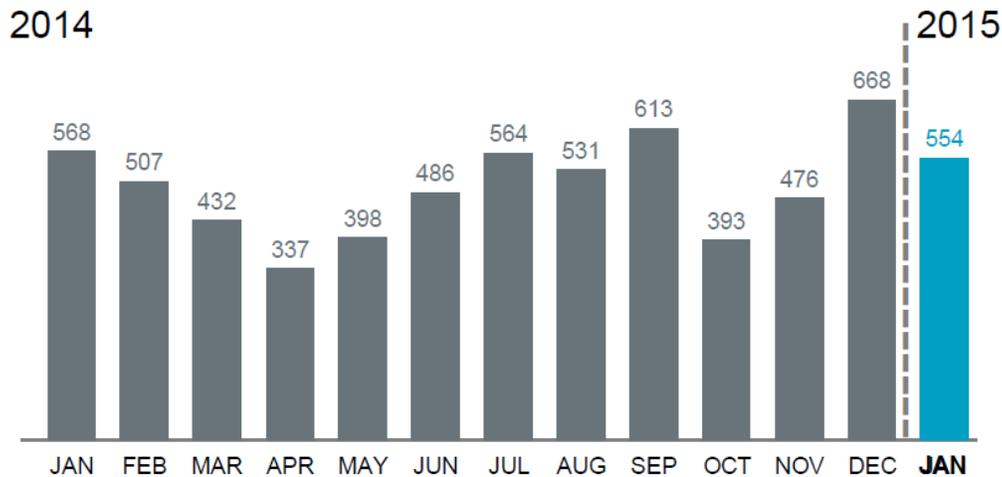
79 A. If the Commission directs ComEd to implement low-use residential subgroups within its
80 residential delivery classes, ComEd does not object to using the MMU method to
81 determine which customer’s maximum monthly usage, over a twelve-month period, did
82 not exceed a threshold level in order to be categorized in the applicable low-use
83 residential subgroup. Additionally, ComEd does not object to a single annual review of
84 its customers to make those determinations. In order to ensure it fully understands Mr.
85 Johnson’s recommendation, ComEd issued a data request to Mr. Johnson; his response is
86 presented in ComEd Ex. 5.01. In his response he affirmed that the review could be
87 patterned after the annual review of individual customers to determine those for which
88 bundled electric supply service has been declared competitive (“Competitive Declaration

89 Review”). That is, low-use residential customers would be identified individually during
90 a review that occurs each year in the month of March using billing data from the prior
91 year. The low-use classification would then be applicable for billing purposes beginning
92 with the June monthly billing period and extending through the following May monthly
93 billing period, regardless of usage patterns during those monthly billing periods.
94 Additionally, Mr. Johnson affirmed his position that (1) a new customer at a preexisting
95 premises should inherit the low-use or non-low-use classification, as applicable, of his or
96 her predecessor, and (2) a customer taking up residence in a new premises should be
97 initially classified based upon the expected full occupancy usage for that premises.

98 While ComEd does not object to such an annual review procedure it is important
99 to point out that, in compliance with 83 Illinois Admin Code § 280.50(c)(1)(I), customers
100 currently receive thirteen months of usage history clearly highlighted on their bill. In
101 2014, ComEd updated its residential billing statement to prominently feature this
102 information, as shown in Figure CST-R1: Bill Image Thirteen Month Usage History, so
103 customers would better understand the rolling twelve month methodology. ComEd
104 recognizes that employing either methodology likely will require ComEd to educate
105 customers to avoid confusion and dissatisfaction with respect to classification in a either
106 subgroup or potential bill impacts.

Figure CST-R1: Bill Image Thirteen Month Usage History

TOTAL USAGE (kWh)



107

108 **III. RELATIONSHIP BETWEEN DEMAND AND USAGE**

109 **Q. AG witness Rubin used AMI meter usage data to develop six scatter diagrams, in**
110 **Figures SJR-2, SJR-3, SJR-4, SJR-5, SJR-6, and SJR-7, respectively. AG Ex. 1.0,**
111 **24:488 – 25:490, 28:539-40, 31:577-78. What is depicted in those diagrams?**

112 **A.** Three of those diagrams, SJR-2, SJR-4 and SJR-6, show correlations that Mr. Rubin
113 calculated between average coincident peaks (“CP”) and average annual kWh usages at
114 twenty usage levels for customers in the SFNH, MFNH, and MFH delivery classes¹,
115 while the other three diagrams, SJR-3, SJR-5 and SJR-7, show correlations that Mr.
116 Rubin calculated between average non-coincident peaks (“NCP”) and average annual

¹ SFNH means Single Family Without Electric Heat, MFNH means Multi Family Without Electric Heat, and MFH means Multi Family With Electric Heat. Additionally, SFH means Single Family With Electric Heat.

117 kWh usages at twenty usage levels for customers in the SFNH, MFNH, and MFH
118 delivery classes.

119 **Q. Mr. Rubin also shows a “best fit” line and associates a very high correlation**
120 **coefficient in each of those diagrams and asserts that information “is important**
121 **because it demonstrates that a customer’s annual energy consumption serves as a**
122 **reasonable proxy for the customer’s contribution to peak demand. With a**
123 **statistical relationship this strong, it may not be necessary to go to the expense (not**
124 **to mention potential customer confusion) of measuring individual customers’**
125 **demands and developing residential demand charges.” AG Ex. 1.0, 26:505-09. Do**
126 **you have any concerns with the analysis Mr. Rubin performed and his associated**
127 **concluding assertions?**

128 A. Yes, using average annual kWh and average CP or NCP for each percentile group does
129 not show the variability of actual customer demand and energy relationship and therefore
130 overstates the correlation. As noted by Mario F. Triola in *Essentials of Statistics*, Third
131 Edition, Copyright 2008, Pearson Education, Inc.:

132 There are three common errors involving correlation:

- 133 1. Causation: It is incorrect to conclude that correlation implies
134 causality.
- 135 2. Averages: Averages suppress individual variation and may inflate the
136 correlation coefficient.
- 137 3. Linearity: There may be some relationship between x and y even
138 when there is no significant linear correlation.

139 Mr. Rubin's correlation analysis suffers from the second common error involving
140 correlation. He makes correlations between averages rather than individual-customer
141 data, masking individual variations.

142 Likewise in the 2nd Edition of *Statistics for Dummies*, Chapter 20: Ten Tips for
143 the Statistically Savvy Sleuth, the author states:

144 Before making any decisions about statistical results from a survey, look
145 to see how the sample of individuals was selected. If the sample wasn't
146 selected randomly, take the results with a grain of salt. If you're looking
147 at the results of an experiment, find out whether the subjects were
148 randomly assigned to the treatment and control groups; if not, ignore the
149 results.

150 Mr. Rubin's selective use of the average values of each group of five percentiles cannot
151 provide the true variance between demand levels and usage levels of the individual
152 customers. Mr. Rubin's reliance on what he indicates is a strong statistical relationship
153 may be misplaced.

154 **Q. Mr. Rubin asserts that "residential customers' peak demands are almost perfectly**
155 **proportional to annual energy usage" and concludes that "the data prove the**
156 **unfairness of straight-fixed variable ("SFV") pricing and, if confirmed in future**
157 **years, would obviate the need to consider demand rates for residential customers."**
158 **AG Ex. 1.0 3:52-55. What are your concerns about his assertion and corresponding**
159 **conclusion?**

160 A. Mr. Rubin is making conclusions about individual customers based upon his analysis of
161 averages. In the realm of statistical analysis, inferences and conclusions pertaining to
162 individuals developed from analyses of averages may be inappropriate and misleading.
163 Simply, conclusions drawn from aggregated data can be erroneous. Furthermore,

164 Mr. Rubin's relationship of his calculated correlation and ComEd's proposed minimum
165 50/50 SFV pricing is not supported by any similar calculation or evidence while he
166 ignores the fundamental reasons electric and gas utilities propose a movement toward
167 SFV-based rate designs.

168 **Q. How would you demonstrate the problems with Mr. Rubin's assertion?**

169 A. An analysis of individual customer data rather than averages of data from groups of
170 customers shows that Mr. Rubin's assertion is inaccurate. ComEd developed scatter
171 diagrams for 100 randomly selected customers with AMI meters in the SFNH delivery
172 class that each had twelve monthly electric bills in 2013. One customer from each usage
173 percentile was included to ensure that a large array of annual kWh usage was analyzed.
174 Figure CST-R2 provides the 2013 CP demand for each customer in relation to the
175 customer's annual 2013 kWh usage. Figure CST-R3 provides the 2013 NCP demand for
176 each customer in relation to the customer's annual 2013 kWh usage. While these two
177 diagrams show a positive correlation between electric demand and usage, they clearly
178 show that the relationship is not the "near-perfect linear relationship" Mr. Rubin claims to
179 exist between demand and usage (AG Ex. 1.0 36:682-683), demonstrating that his
180 arguments are not valid.

Figure CST-R2: Random SFNH AMI Customers 2013 CP vs. 2013 Annual kWh

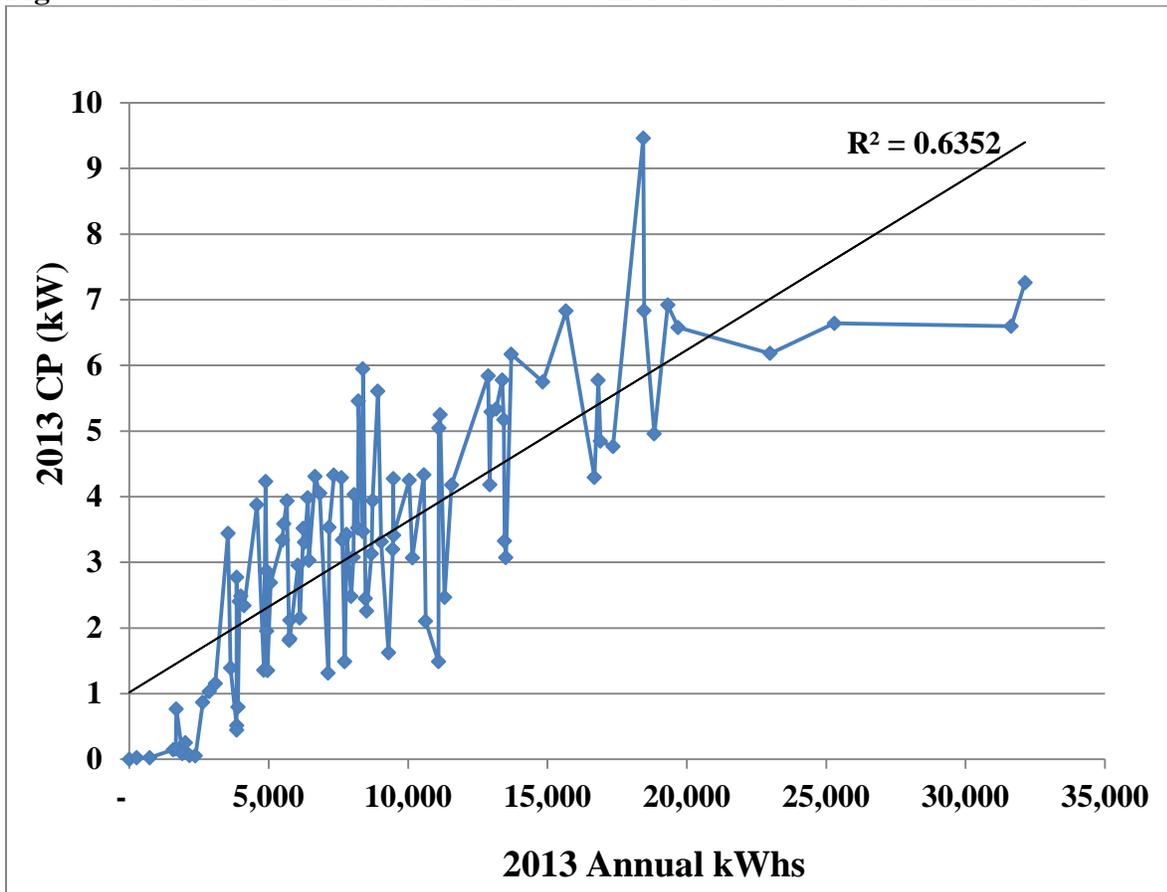
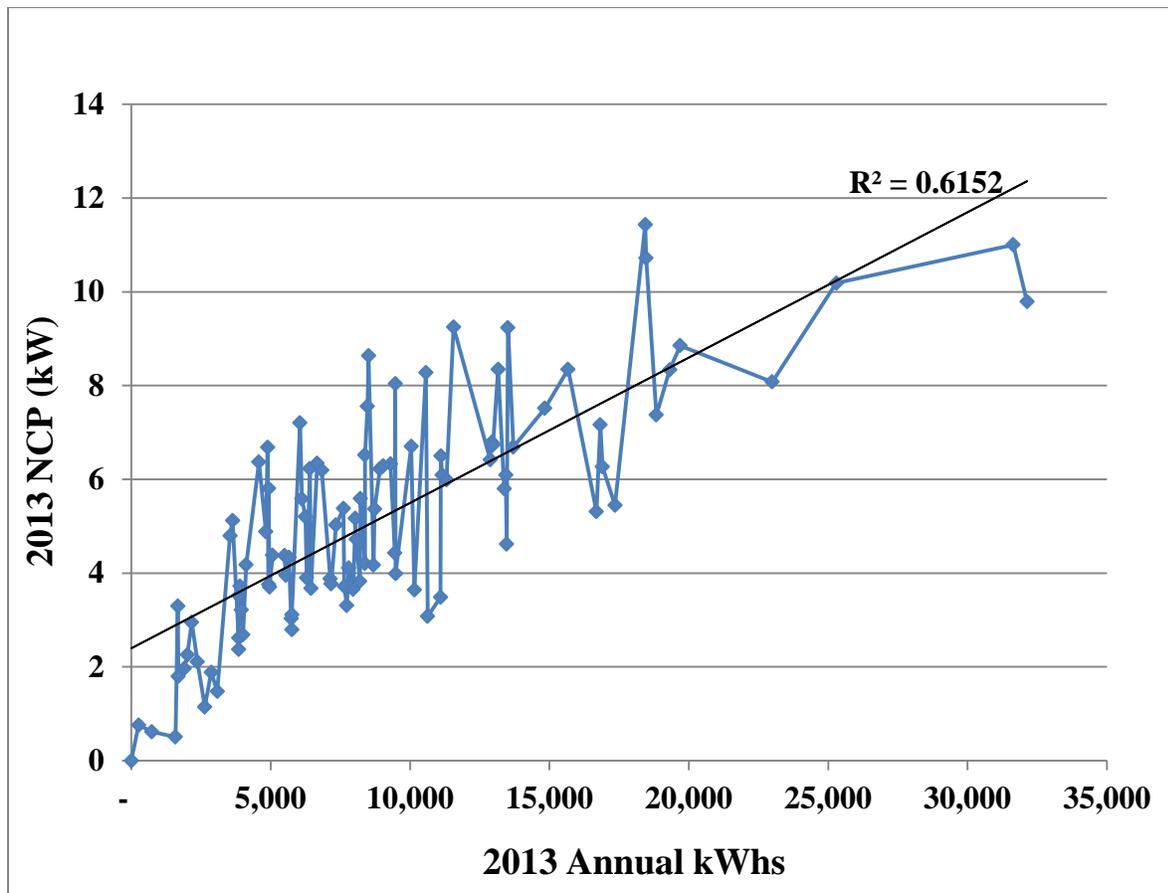


Figure CST-R3: Random SFNH AMI Customers 2013 NCP vs. 2013 Annual kWh



182

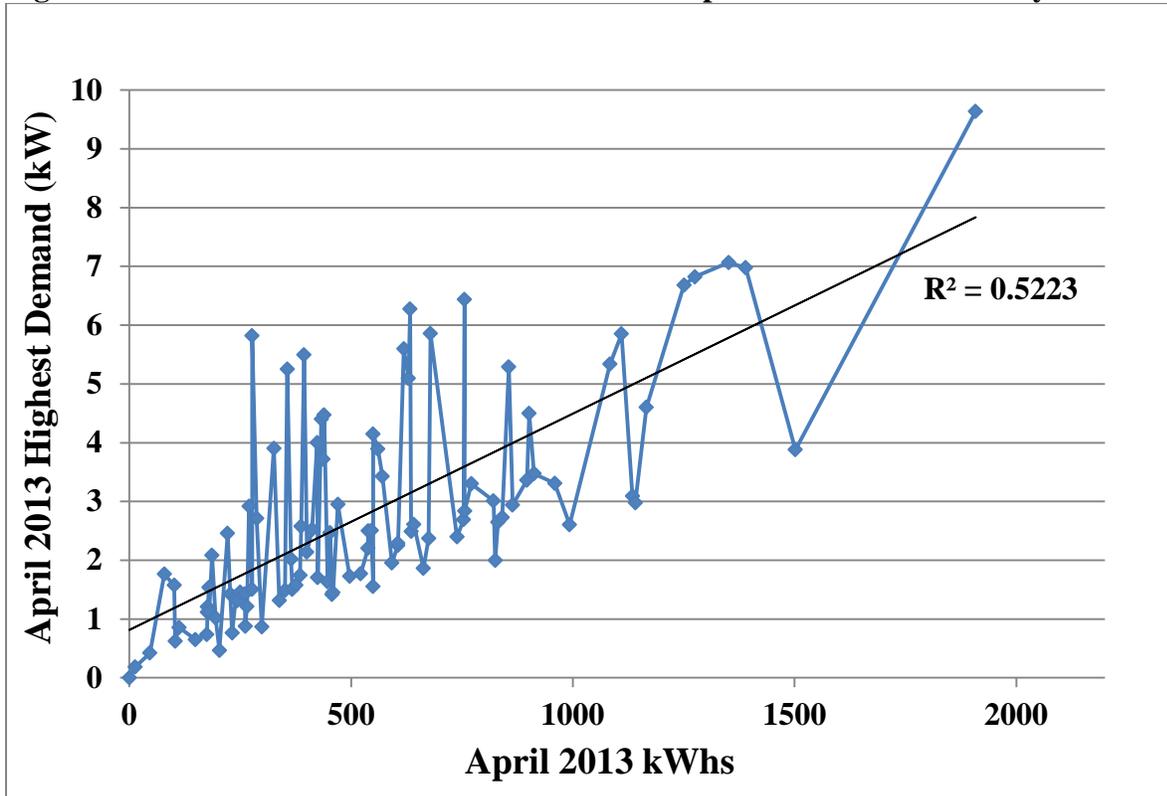
183 **Q. Would the results be different if the individual customer’s kWh usage is compared**
184 **to the highest monthly demand for a single month?**

185 **A.** No. For the 100 randomly selected customers ComEd also developed scatter diagrams
186 for April 2013, a “shoulder” month during which air conditioning would normally not be
187 used and for July 2013, a month during which air conditioning would typically be used.²
188 Figure CST-R4 provides the scatter diagram using April monthly data and Figure CST-

² In 2013 the month of April had eight cooling degree days and the 30-year average is nine cooling degree days. A cooling degree day is the number of degrees that a day’s average temperature is above 65 Fahrenheit at O’Hare Airport.

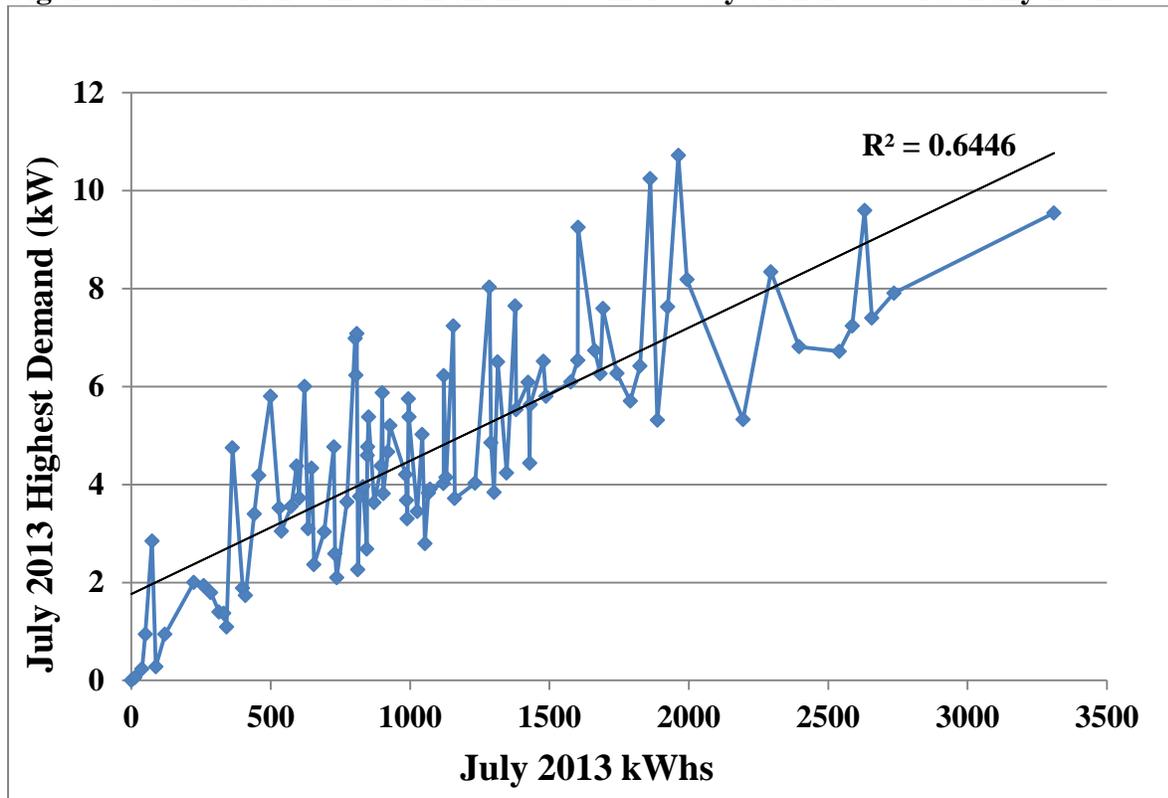
189 R5 provides the scatter diagram using July monthly data. Even in the April monthly
190 billing period, the correlation between energy usage and demand is not as strong as
191 Mr. Rubin portrayed.

Figure CST-R4: Random SFNH AMI Customers April Max kW vs. Monthly kWh



192

Figure CST-R5: Random SFNH AMI Customers July Max kW vs. Monthly kWh



193

194 **Q. How does the previous four figures that show customers' individual demands can**
195 **vary dramatically relative to the kWh consumption address concerns from other**
196 **parties?**

197 **A. Mr. Johnson raised the following argument:**

198 Consider, for example, a residential customer that has the Company's
199 lowest level of electricity usage versus a residential customer that has
200 the Company's highest level of electricity usage. Under an SFV-based
201 rate design, both residential customers would pay the same amount for
202 demand costs that are included in their monthly customer charges. The
203 SFV assumes that the distribution costs they cause the Company to incur
204 would be comparable. However, a more reasonable assumption would
205 be that the customer with the highest level of usage would have a larger
206 demand impact on the grid system than the customer with the lowest
207 level of usage. ComEd's proposed customer charge would be the same
208 for these two customers, which means that the customer with the lowest
209 usage and the customer with the highest usage would be paying an equal

210 share for the recovery of these costs. This result would be contrary to
211 cost causation principles.

212 AG Ex. 1.0 36:682-83.

213 The data provided in all of the previous figures show how the actual demand levels can
214 exceed or be lower than what may be the expected demand level for both the low- and
215 high- usage level customers. Customers with lower kWh usage levels can, and do, have
216 higher demand levels that would not be considered when ComEd recovers its costs for
217 distribution facilities through a per-kWh recovery mechanism. All of the customers
218 represented in the figures are located in a similar geographic area and are served from
219 similar distribution facilities. Clearly, utilizing a minimum 50/50 SFV rate design, which
220 provides for a minimum contribution for those distribution facilities, is consistent with
221 cost causation principles.

222 **Q. What conclusions do you reach from the evidence provided in the four figures?**

223 A. The evidence supports that demand-based kW billing is more accurate than kWh-energy-
224 based billing to provide for the recovery of demand-related costs. This is because the
225 correlation between the two units is not as strong as Mr. Rubin asserted, due to his use of
226 average values instead of actual customer data and its true-to-life variability. Moreover,
227 the data show that customers with the lowest kWh consumption can have demand levels
228 equivalent to customers with higher kWh consumption; cost causation principles support
229 that these customers should pay for the use and ready availability of the distribution
230 facilities that are installed to serve them.

231 **IV. COMED'S MINIMUM 50/50 SFV RATE DESIGN PROPOSAL**

232 **Q. AG witness Rubin observes that “[l]ow-use customers ... have total demand-related**
233 **costs of only \$54,517,110, while the other customers have demand-related costs of**
234 **\$609,140,769. That is, 25% of the customers are responsible for only 8.2% of demand-**
235 **related costs.” AG Ex. 1.0, 35:659-62. How accurate is Mr. Rubin’s observation?**

236 **A.** Overall, Mr. Rubin’s observation on this point is accurate, as shown in ComEd Ex. 2.06,
237 the illustrative ECOSS with each residential delivery class segmented into two
238 subgroups. In that ECOSS 8.2% of the distribution demand-related costs are allocated to
239 the low-use subgroup (usage percentiles 1-25) in the SFNH Delivery Class. It is
240 important to note that 8.2% allocation to the low-use subgroup within the SFNH Delivery
241 Class is the same with or without the minimum 50/50 SFV rate design. This is true
242 because the allocation of the demand-related costs to the low-use subgroup is determined
243 within the applicable ECOSS model and adjustments to fixed or variable charges are
244 determined within the rate design model. As shown in Table CST-D18 in my direct
245 testimony, ComEd Ex. 2.0, the percentage of fixed demand-related costs and customer-
246 related costs recovered via fixed charges is 65.3% for SFNH, 87.8% for MFNH, 51.2%
247 for SFH and 74.5% for MFH for each applicable low-use subclass. Consequently the
248 8.2% of distribution demand-related costs assigned to the SFNH Delivery Class would
249 not change with the implementation of the minimum 50/50 SFV rate design when the
250 percent of assigned to a subgroup’s fixed charges in the ECOSS already exceeds 50%.

251 **Q. Mr. Rubin then argues, “SFV pricing would have collected 25% of demand-related**
252 **costs from the 25% of customers placed in the low-use group.” AG Ex. 1.0, 36:670-71.**

253 **Does his argument have merit?**

254 A. No. Table CST-R1 summarizes the percentage of customer-related and distribution
255 demand-related costs recovered from percentiles 1-25 and 26-100 for each of the
256 residential delivery classes when low-use subgroups are implemented.

Table CST-R1 - Percent of Customer and Distribution Demand-Related Costs Recovered from Residential Delivery Classes With Low-Use Subgroups Implemented

	SFNH	MFNH	SFH	MFH
Without or With a Minimum 50/50 SFV Rate Design				
Percent of Customer-Related Costs Recovered from Percentiles 1-25	25%	25%	25%	25%
Percent of Customer-Related Costs Recovered from Percentiles 75-100	75%	75%	75%	75%
Percent of Demand-Related Costs Recovered from Percentiles 1-25	8.2%	3.6%	12.9%	7.9%
Percent of Demand-Related Costs Recovered from Percentiles 75-100	91.8%	96.4%	87.1%	92.1%

257

258 **Q. Does Mr. Rubin’s argument have merit if low-use subgroups are not implemented?**

259 A. No. Tables CST-R2 and CST-R3 summarize the percentage of customer-related and
260 distribution demand-related costs recovered from percentiles 1-25 and 26-100 for each of
261 the residential delivery classes when low-use subgroups are not implemented. Table
262 CST-R2 summarizes a situation in which the minimum 50/50 SFV rate design is not

263 implemented, while Table CST-R3 provides the summary for a situation in which the
 264 minimum 50/50 SFV rate design is implemented. For the SFNH Delivery Class, 7.6% of
 265 the distribution demand-related costs are recovered from the lowest using 25% of
 266 customers without SFV rate design and only 10.9% of distribution demand-related costs
 267 are recovered from the lowest using 25% of customers with the minimum 50/50 SFV rate
 268 design.

Table CST-R2 - Percent of Customer and Distribution Related Costs Recovered from Residential Delivery Classes Without Low-Use Subgroups and Without a Minimum 50/50 SFV Rate Design

	SFNH	MFNH	SFH	MFH
Percent of Customer-Related Costs Recovered from Percentiles 1-25	25%	25%	25%	25%
Percent of Customer-Related Costs Recovered from Percentiles 26-100	75%	75%	75%	75%
Percent of Demand-Related Costs Recovered from Percentiles 1-25	7.6%	5.6%	7.5%	5.9%
Percent of Demand-Related Costs Recovered from Percentiles 26-100	92.4%	94.4%	92.5%	94.1%

269

Table CST-R3 - Percent of Customer and Distribution Related Costs Recovered from Residential Delivery Classes Without Low-Use Subgroups but With a Minimum 50/50 SFV Rate Design

	SFNH	MFNH	SFH	MFH
Percent of Customer-Related Costs Recovered from Percentiles 1-25	25%	25%	25%	25%
Percent of Customer-Related Costs Recovered from Percentiles 26-100	75%	75%	75%	75%
Percent of Demand-Related Costs Recovered from Percentiles 1-25	10.9%	5.6%	11.4%	6.5%
Percent of Demand-Related Costs Recovered from Percentiles 26-100	89.1%	94.4%	88.6%	93.5%

270

271 **Q. Why does ComEd consider it to be reasonable that the percentage of demand-**
 272 **related costs recovered from the low-use customers in the SFNH delivery class could**
 273 **exceed the percentage of demand-related costs allocated to those customers in the**
 274 **ECOSS with two subgroups from 8.2% to 10.9% as identified in tables CST-R2 and**
 275 **CST-R3?**

276 **A.** It is reasonable to expect that low-use customers make a slightly higher contribution
 277 (from 8.2% to 10.9%) for the recovery of the costs for distribution facilities because those
 278 facilities were built to serve such premises and must stand ready for the time the
 279 customer may choose to increase demands on those facilities. As Mr. Robert Garcia
 280 stated in his direct testimony: “Ultimately, the question before the Commission is
 281 whether and if so, to what extent, residential customers should be expected to make a
 282 minimum contribution for the provision and maintenance of distribution facilities.”
 283 ComEd Ex. 1.0, 1:16-19. Furthermore, the evidence provided in the customer migration
 284 tables in my direct testimony (ComEd Ex. 2.0, 38:665-68) demonstrates that many

285 customers are in the lowest 25 usage percentiles for limited periods of time and then
286 migrate to higher usage percentiles. While these customers are temporarily in the lowest
287 percentiles, ComEd must maintain distribution transformers, poles, wire, switches, and
288 other facilities to accommodate such customers in the event that they migrate to higher-
289 usage percentiles. These are the *exact same* facilities that serve many neighboring
290 customers that are not in the lowest percentiles. ComEd must plan for, build, and
291 maintain distribution facilities capable of serving customers' expected or potential
292 demands on the distribution system and cannot exchange such facilities when a customer
293 may become classified as a low-use customer.

294 **Q. Mr. Rubin asserts that over a five-year period many of a utility's costs would be**
295 **variable because the size of transformers could be changed. AG Ex. 1.0, 10:181-82.**
296 **How do you respond?**

297 A. Transformers are installed based upon the expected load of the customer(s) they are
298 installed to serve. It is uncommon for ComEd to increase the size of transformers serving
299 customers except for occasional situations in which the customer increases the size of its
300 building or has a change in operations where more or larger electricity consuming
301 equipment is added and the existing transformation will become overloaded. Generally
302 these occasional situations pertain to nonresidential customers as it is uncommon for
303 ComEd to need to increase the size of a transformer serving residential customers even if
304 a customer puts on an addition to his or her home, upgrades their service panel, or installs
305 air conditioning. Regardless of customer type, ComEd almost never exchanges a
306 transformer to a smaller size if a customer lowers his or her usage marginally through

307 efficiency efforts or even vacates the property such that usage drops to almost zero. It is
308 simply not cost effective to remove/exchange an operational transformer that may be
309 more fully loaded in the future. Practically, to make such a change, ComEd would not
310 only have the labor costs (engineering and field personnel) invested in the initial
311 transformer installation, it would then incur costs for additional hours of labor to remove
312 the existing transformer and install the new smaller transformer. During such a
313 procedure all of the customers served from that transformer would experience a power
314 outage during the replacement, only to install a transformer that may be a few of hundred
315 dollars less in purchase cost.³ Therefore, Mr. Rubin's claim that transformer costs are
316 variable is incorrect and it is appropriate to consider the costs associated with the
317 purchase, installation and maintenance of distribution transformers as fixed costs.

318 **Q. In reference to the prior movement in ComEd's rates for residential customers**
319 **toward SFV rate design approved by the Commission in ICC Docket No. 10-0467,**
320 **CUB witness Bodmer maintains that ComEd made an error in the application of the**
321 **rate design. CUB Ex. 1.0, 20:360-68. Is he correct?**

322 **A.** No. Mr. Bodmer appears to be confused. The "unintentional consequence" to which Mr.
323 Bodmer refers was addressed in my direct testimony in this proceeding. ComEd Ex. 2.0,
324 14:279-88. As I explained, ComEd initially proposed a three-step transition towards a
325 movement toward SFV rate design in Docket No. 10-0467. The first step would have
326 implemented a rate design through which 60% of ComEd's delivery service costs would

³ The difference in purchase cost from a 50 kVA overhead transformer to a 25 kVA transformer is approximately \$410.

327 be recovered from fixed charges, which included the Customer Charge and Standard
328 Metering Services Charge. That percentage would have increased after one year to 70%
329 in the second step, and finally after another year to 80% in the third step. At that time,
330 approximately 51.2% of the delivery service costs allocated to the MFNH Delivery Class
331 was identified as being customer-related, and without any movement toward SFV rates,
332 those costs were being recovered via fixed charges for the MFNH Delivery Class.
333 ComEd, therefore, identified the 60% mark as an appropriate first step in the movement
334 toward a SFV rate design. If the Commission had approved ComEd's proposal, the
335 unintentional consequence of reducing the Customer Charge to the MFNH Delivery
336 Class would not have occurred. However, the Commission rejected ComEd's proposal,
337 approving a 50/50 SFV rate design instead, and the Customer Charge for the MFNH
338 Delivery Class had to be reduced in order to reduce fixed cost recovery from fixed
339 charges to 50%. As a result of the Commission's directive, ComEd had to recover some
340 of its fixed, customer-related costs attributable to the MFNH Delivery Class from the
341 variable Distribution Facilities Charge applicable to that class.

342 **V. SEGMENTING DISTRIBUTION FACILITIES COSTS BY AGE AND**
343 **CONFIGURATION**

344 **Q. CUB witness Bodmer argues that ComEd could have examined all of the “real**
345 **costs” to the residential subgroups rather than “plopping all of the costs into one pie**
346 **and splitting them up using load characteristics[.]” CUB Ex. 1.0, 13:242 – 14:245.**
347 **How do you interpret his assertion?**

348 **A.** According to Mr. Bodmer's diagram on page 14 of his direct testimony, he maintains that
349 for the low-use, moderate-use and high-use subgroups, ComEd should allocate

350 distribution costs in its ECOSS based upon the: (1) the density of customers in each
351 subgroup in relation to the miles of primary lines using the subgroup's CP allocator; (2)
352 the density of customers in each subgroup in relation to the miles of secondary lines
353 using the subgroup's NCP allocator; (3) the overhead and underground configuration of
354 primary and secondary lines for each subgroup; and (4) the age of primary and secondary
355 lines and other equipment to analyze the historic costs for distribution facilities serving
356 each subgroup.

357 **Q. Has Mr. Bodmer made similar suggestions in prior ComEd dockets?**

358 A. At least twice. In ICC Docket No. 10-0467, Mr. Bodmer stated:

359 The Commission should consider requiring ComEd to account in its cost of
360 service study the dramatic differences in the age, appearance, density, and
361 configuration of distribution equipment for areas such as the City of Chicago
362 relative to other parts of ComEd's service area, such as newly built suburban
363 subdivisions. This could be implemented on a practical basis by requiring
364 ComEd to develop separate rates for those customers who are primarily
365 served from overhead facilities versus those ratepayers who are served from
366 underground facilities.

367 ICC Docket No. 10-0467, City Ex. 1.0, 16:1302-09.

368 Similarly in ICC Docket No. 08-0532 Mr. Bodmer argued: "[A]s ComEd has
369 made provision for a high voltage ratepayer class, it could also distinguish between
370 ratepayers who are served by underground versus overhead service and it could
371 distinguish regions by the age of equipment and the density of lines." ICC Docket No.
372 08-0532, City Ex. 1.0, 107:2356-59.

373 **Q. Did the Commission direct ComEd to further segment its embedded costs as**
374 **Mr. Bodmer suggested?**

375 A. No, the Commission did not direct any such changes in either docket. While the
376 Commission does not appear to have specifically addressed Mr. Bodmer's requests, in
377 ICC Docket No. 08-532, the Commission rejected requests to do a similar type of
378 allocation based upon the single-phase and three-phase configuration of distribution
379 facilities and by the primary voltage level of certain distribution facilities. Specifically
380 the Commission stated:

381 Both REACT and IIEC recommend conducting further studies related to
382 how primary or secondary voltage customers use primary distribution
383 facilities in 4 kV single phase or three-phase configuration. According to
384 ComEd, such studies would require a highly complex study of the almost
385 4.8 million meter points connected to almost 6,400 circuits. Then, a
386 further study would be required to precisely determine which costs are
387 related to single-phase, two-phase, three-phase, 34 kV, 12 kV or 4 kV
388 configurations. Additionally, ComEd asserts that such studies would
389 require numerous assumptions to assign such costs. While we note that
390 ComEd has the capability to perform such studies, the Commission agrees
391 that such studies are highly complex. Moreover, the Commission finds
392 that allocation by "path of service" is not the industry norm and can easily
393 become an unsustainable process because the distribution system is
394 constantly changing. As such, the Commission rejects both REACT's and
395 IIEC's proposed future studies.

396 ICC Docket No. 08-0532 (Final Order), at 50-51.

397 **Q. Mr. Bodmer asserts that ComEd could and should allocate costs between low-use**
398 **and other customers within the residential delivery classes based upon differences in**
399 **the age, appearance, density, and configuration of distribution equipment. CUB Ex.**
400 **1.0, 13:242 – 14:245. How do you respond?**

401 A. ComEd should not make cost allocations between low-use and other residential
402 customers on the basis of customer density or the age, appearance, or configuration of the
403 distribution facilities serving customers. No evidence has been provided to show that the
404 majority of low-use customers reside in areas with density levels that are different from

405 the areas in which customers that use greater quantities of electricity reside. Moreover,
406 there is no sound basis to assume that low-use customers use distribution facilities that
407 differ in age, appearance, and configuration from the distribution facilities used by
408 customers using greater quantities of electricity. A premises that is occupied by a low-
409 use customer one year may be occupied by a high-use customer the next year. The
410 distribution equipment used to serve that premises are not replaced when a new occupant
411 takes up residence there, in the same way a customer is not going to replace their service
412 entrance equipment if they are a low-user. Moreover, as ComEd showed in the
413 *Residential Electricity Usage and Bill Impacts of the Straight Fixed Variable Rate Design*
414 (“Residential Usage Study”) originally submitted to the Commission on November 8,
415 2011, and subsequently filed as ComEd Ex. 2.33 in Docket No. 13-0387, customers using
416 among the lowest levels of electricity in a residential delivery class can reside down the
417 block or even down the hall from customers using among the highest usage levels in the
418 class. That remains true today.

419 In order to complete a study to assign costs based upon differences in the age,
420 appearance, density, and configuration of distribution equipment, ComEd would need to
421 identify and assign ages and configurations of miles of conductors and poles and
422 numerous distribution facilities located in an 11,000 square mile area for over 3.4 million
423 residential customers and it is not clear how such a study would include the distribution
424 facilities that serve nonresidential customers. Moreover, the configurations of
425 distribution facilities serving customers can and do change. For example, changes may
426 be made in configurations to improve system reliability or they may need to be made in
427 response to storm situations or load growth. As part of normal maintenance old facilities

428 are often replaced with new facilities. For all of these reasons such a study is not
429 practical. Finally, low-use customers often live in the same density levels and facilities
430 configurations as moderate- and high-use customers, and they depend upon the *very same*
431 distribution facilities as those other customers. As I previously noted, the Commission
432 has rejected similar studies to split costs between single-phase and three-phase
433 distribution facilities.

434 **Q. Is Mr. Bodmer correct in saying that ComEd accounted for density in its previous**
435 **cost studies?**

436 A. While I was not involved in their preparation and I have no experience in the preparation
437 of marginal cost of service studies (“MCOSSs”), in a review of ComEd’s historical
438 records, I was able to ascertain that ComEd used to consider density characteristics in its
439 MCOSSs. However, density characteristics have not been used in its ECOSSs.

440 **Q. What else did you learn from that review of historical records?**

441 A. The Commission has not accepted ComEd cost studies that included density
442 considerations since 1995. Specifically, I was able to uncover the following historical
443 information:

- 444 • ComEd submitted a MCOSS that included density considerations in Docket No.
445 94-0065, ComEd’s last bundled service rate case.
- 446 • The last ComEd MCOSS accepted by the Commission was filed in Docket No.
447 94-0065.
- 448 • ComEd submitted a MCOSS that included density considerations in Docket No.
449 99-0117, ComEd’s first delivery service rate case.

- 450 • ComEd also submitted an ECOSS that did not include density considerations in
451 Docket No. 99-0117.
- 452 • The Commission rejected ComEd’s MCOSS, but accepted ComEd’s ECOSS in
453 Docket No. 99-0117.
- 454 • ComEd submitted a MCOSS that included density considerations in Docket
455 No. 01-0423, ComEd’s second delivery service rate case.
- 456 • ComEd also submitted an ECOSS that did not include density considerations in
457 Docket No. 01-0423.
- 458 • The Commission again rejected ComEd’s MCOSS but accepted ComEd’s
459 ECOSS in Docket No. 01-0423.
- 460 • Currently, the Commission requires utilities to submit only ECOSSs in rate cases
461 as provided in the Illinois Administrative Code, 83 Ill. Admin. Code 285.5110.

462 **Q. How do you respond to Mr. Bodmer’s claims that ComEd changed its positions**
463 **between the 2013 Rate Design Investigation (“RDI”) and this proceeding? CUB**
464 **Ex. 1.0, 11:196.**

465 A. Mr. Bodmer is mistaken. ComEd has not “changed its positions” as he suggests. In
466 particular, Mr. Bodmer shows a listing of items he identifies as ComEd’s “positions” in
467 the 2013 RDI and a corresponding listing of items he identifies as ComEd’s “changed
468 position” in this proceeding. His list merely describes different types of data and
469 computations provided and do not represent “positions.” ComEd has made available
470 voluminous amounts of data and analyses to allow the Commission to make a reasonable

471 judgment concerning the issue of implementing low-use subgroups in the residential
472 delivery classes.

473 The purpose of Mr. Bodmer's listing is not clear, but given his position in direct
474 testimony, it appears he is mischaracterizing ComEd's positions to support his proposal
475 to expand ComEd's ECOSS to include his "vision" of a cost study. Such an expansion of
476 the ECOSS would neither be appropriate nor practical.

477 **VI. AMI METER USAGE DATA**

478 **Q. Do parties support the use of AMI meter usage data in the analyses performed in**
479 **this proceeding for ComEd's residential customers?**

480 A. Generally, I understand that the parties found the AMI meter usage data useful in helping
481 to analyze the characteristics of low-, medium-, and high-use customers.

482 **Q. Are there limitations in the use of AMI meter usage data?**

483 A. Currently, yes. Due to the ongoing deployment of AMI meters, AMI meter usage data
484 are available only for premises located in specific geographic areas. To date, AMI meters
485 have been deployed in primarily urban and some suburban areas; as a result, the meter
486 usage data collected from AMI meters do not provide full-year data from a
487 comprehensive cross section of all ComEd's customers. AG witness Rubin appeared to
488 recognize this limitation. He noted that reasonable conclusions about the demand
489 characteristics of the SFH Delivery Class could not be drawn because to date only 314
490 SFH Delivery Class customers out of a population of 35,237 are provided with AMI
491 metering. AG Ex. 1.0, 4:77 – 5:93. The limited availability of AMI meter usage data for
492 SFH Delivery Class customers is not surprising. Many SFH Delivery Class customers

493 are located in rural areas where access to natural gas lines is limited. Because rural areas
494 are being addressed later in the AMI deployment schedule, it stands to reason that AMI
495 meter usage data for SFH Delivery Class customers are generally not yet available when
496 compared to the total population of SFH Delivery Class customers.

497 **Q. Does the AMI meter usage data provided in this docket constitute a “sample” of the**
498 **available AMI data?**

499 A. No. The AMI meter usage data provided in this proceeding include *all* the AMI meter
500 usage data available for *all* premises at which AMI meters were in operation for all of
501 2013.

502 **Q. Based upon the AMI meter usage data presented in this proceeding, Mr. Bodmer**
503 **calls on the Commission to order ComEd to reallocate 18% of distribution revenue**
504 **requirement away from the multi-family delivery classes and to the single family**
505 **delivery classes. CUB Ex. 1.0, 4:52-58, 17:309-17. How do you respond?**

506 A. As detailed in my direct testimony, ComEd found that the number of customers in the
507 Residential Load Study (“RLS”) sample corresponding to the lowest 25 percentiles of
508 customers was limited and therefore ComEd utilized AMI meter usage to supplement the
509 data used in its analyses. ComEd Ex. 2.0, 28:571 – 29:586. Mr. Bodmer’s workpaper
510 may be using a blend of AMI and RLS data to determine his reallocation of 18% of
511 distribution revenue requirement away from the multi-family delivery classes to the
512 single family delivery classes. ComEd supports investigating how AMI data can be used
513 for future cost allocations as the current AMI deployment plan schedule provides for the
514 deployment of AMI meters to all customers by the end of 2018. It is up to the

515 Commission to determine whether Mr. Bodmer’s request to shift costs from one delivery
516 class to another delivery class, based upon the limited geographical deployment of AMI
517 meters, is appropriate.

518 **Q. In addition to the movement of costs from single family to multi-family, CUB**
519 **witness Bodmer argued there should be further reductions for the entire residential**
520 **sector because the AMI CP and NCP load factors are higher when compared to the**
521 **load research data. CUB Ex. 1.0, 4:52-58, 16:290 – 17:316. How do you respond?**

522 A. With respect to Mr. Bodmer’s argument that the costs allocated to the entire residential
523 sector would be lower versus the nonresidential sector, it seems Mr. Bodmer overlooked
524 that ComEd weather normalizes the CPs and NCPs between the residential and
525 nonresidential sectors so the CP and NCP allocation between the two sectors remains
526 consistent with each filing. Therefore, there would not be a shift of costs between
527 nonresidential and residential customers by utilizing the AMI meter usage data for the
528 determination of CP and NCP values.

529 **Q. Mr. Bodmer criticized ComEd’s analyses by saying, “ComEd’s analysis focused on**
530 **low-use analysis within a class rather than across classes; in particular it did not**
531 **address costs across the multi-family class and the single-family class.” CUB Ex.**
532 **1.0, 4:70-72; see also generally CUB Ex. 1.0, 15:271 – 18:342. What is your response**
533 **to this criticism?**

534 A. ComEd performed its analyses in accordance with an explicit directive from the
535 Commission, which provided: “The Commission further orders ComEd to conduct and
536 provide an ECOSS with a distinct low-use subclass of each residential delivery class.”

537 Docket No. 13-0387 (Order, Dec. 18, 2013), at 47. This directive also was noted in the
538 Staff report, which became part of the Initiating Order in this proceeding.

539 **VII. CONCLUSION**

540 **Q. Do you have any conclusions or concerns from your review of parties' direct**
541 **testimonies and based upon the additional information you have provided?**

542 A. Yes. The evidence is clear that Mr. Rubin's asserted correlation between kWh
543 consumption and kW demand is not as perfect as he claims. His recommendation to
544 retain kWh billing determinants even when kW billing units may become viable for use is
545 suspect and premature because he relies upon his inappropriately computed correlation
546 coefficients in drawing that conclusion. Moreover, the implementation of residential
547 subgroups may cause customer confusion and dissatisfaction, as it may not result in
548 recognizable changes in customers' bills. Residential subgroups may prove difficult to
549 manage within the confines of ComEd's customer billing and information systems.

550 **Q. Does this complete your rebuttal testimony?**

551 A. Yes.