A. Clearly not. If the cost of service were actually higher in the City than outside the City, then higher prices for City ratepayers might be justifiable. However, it is clear from reviewing just a few pieces of general information in the paragraphs below that distribution cost of service is a lot lower for most residential consumers in the City than for residential ratepayers outside the City. Information that demonstrates the lower cost of service for low-use consumers includes a potentially better residential load factor inside the City, higher density inside the City than outside the City, and older distribution equipment inside the City. (Unfortunately, all these cost differences cannot be reduced to a single, simple number because of the lack of ComEd data.)

Q. Looking at the cost drivers you identified earlier, what is efficiency of electricity use and why does this matter?

A. The efficiency of consumer use of electricity can generally be measured by the load factor. Annual load factor is defined as average usage per hour over the course of a year divided by usage at the time of ComEd's system peak. It is a measure of how even (steady) consumer usage is relative to the peak ComEd's facilities must serve. Load factor is proportionally (but inversely) related to cost of service, meaning that a 10% increase in load factor is associated with a 10% decrease in cost of service, when cost of service is measured on a per kWh basis, like the price data discussed above. If low use is correlated with high load factor – something I believe to be the case but have not been able to demonstrate without analyzing ComEd's load research data -- then low use consumers should see lower revenue per kWh prices. Inverted block rate or charge designs can achieve that relationship.

675

676 **Q. Can you summarize the efficiency of electricity use for different usage sub-groups of**
677 **residential consumers?**

678 **A.** Unfortunately I have not been able to do so at this time. The City requested detailed raw
679 data for the consumers that ComEd tracks to gather the data it uses to compute the peak
680 load for the aggregate residential class. Those data were received too late to be analyzed
681 and addressed in this testimony. With the requested data, I will be able to compute
682 (among other things) the load factor by usage level, as well as by region. Then I should
683 be able to answer this question about efficiency of use. When I looked at the issue in the
684 past, low use City consumers had a markedly better load factor than high use consumers.
685 I plan to provide additional analyses in supplemental or rebuttal testimony.

686 **Q. Why does consumer density matter in measuring the cost of delivery service?**

687 A. When ratepayer populations are denser, that is, more closely packed in a geographic area,
688 the number of poles, the amount of primary wire, and the amount of secondary wire
689 required to provide service to that area are reduced on a per ratepayer basis. Thus, the
690 geographic density of a consumer population has a large impact on ComEd's costs of
691 service. ComEd provided data on the number of distribution miles by region, which
692 demonstrates that the two City Regions (not surprisingly) have a higher density than any
693 of the other ComEd areas. Recall that these regions also had the lowest usage per
694 ratepayer and the highest price per ratepayer.

695

STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

COMMONWEALTH EDISON COMPANY	**)**	
	)	
Tariff filing to present the Illinois Commerce	**)**	**Docket. 13-0387**
Commission with an opportunity to consider	**)**	
Revenue neutral tariff changes related to rate	**)**	
Design authorized by subsection 16-108.5(e) of	**)**	
the Public Utilities Act	**)**	

REBUTTAL TESTIMONY OF EDWARD C. BODMER
ON BEHALF OFTHE CITY OF CHICAGO AND THE CITIZENS UTILITY BOARD

CITY/CUB EXHIBIT 2.0

SEPTEMBER 11, 2013

ISSUES NOT ADDRESSED BY COMED

Q. Several ComEd witnesses spend many pages addressing various issues in your testimony. Did their testimony cover the important issues in this case?

A. No. First, as I noted earlier, ComEd has provided no substantive rebuttal to may demonstration of the strong correlation between consumer usage levels and ComEd's distribution costs, which ComEd admits are driven by demand.

Second, a large part of my cost of service analysis involved the cost responsibility of different regions that is driven by density, age of equipment and undergrounding. I spent much of my testimony discussing the fact that higher density, older equipment and less undergrounding are correlated with low usage, using City consumers as a proxy for low use consumers.[1] As an example of the cost drivers, I showed that the cost responsibility in terms of miles of lines per ratepayer is 6.95 miles per 1000 consumers inside the City and 25.96 miles per 1000 consumers outside the City. Since density, age and overhead lines are correlated with lower cost, the cost per kWh increases with levels of higher usage, irrespective of load factors.

Because of the cost impacts of high density, older equipment, and less undergrounding, consumers with low demand and lower costs should still have lower account charges, implemented on a tiered basis. Even if demand meters are deployed and demand costs allocated on the basis of measured demand, those consumers' lower costs will persist and should be recognized. Further, the cost of smart meters should be treated as a demand related cost, since spending money on the more expensive meter is intended to improve energy efficiency and lower distribution costs, by (among other things)

[1] My direct testimony (City-CUB Ex. 1.0 at 30) explained my use of this proxy.

measuring and displaying demand to consumers. If ComEd cannot recognize the cost differences attributable to usage and demand differences in its rates, one wonders why new meters are being installed, since without proper recognition of costs in rates, sophisticated, hourly measurements and displays will not help consumers.

Third, a significant portion of my direct testimony discussed the unreasonableness of ComEd's conclusion that customer related and metering costs add up to more than 50% of the total cost of serving multi-family ratepayers. ComEd achieves this result by including the costs of market research, stolen electricity, reconnecting ratepayers, providing technical services to ratepayers, relocating facilities, regulatory strategy, and administrative costs, as well as costs associated with ratepayer moves, ratepayer complaints, and billing system software bells and whistles in its calculation of customer costs. ComEd then allocates these costs on the basis of the number of accounts, implying that if a house is divided from a single family home into a duplex, all of these costs would increase. With respect to (a) the cost effects of ratepayer density, equipment age, and undergrounding or (b) actual cost causation for costs of consumer complaints, ratepayer moves, stolen electricity etc., ComEd fails to address these important factors.

RESPONSE TO REBUTTAL TESTIMONY OF MS. CHRISTINE BRINKMAN

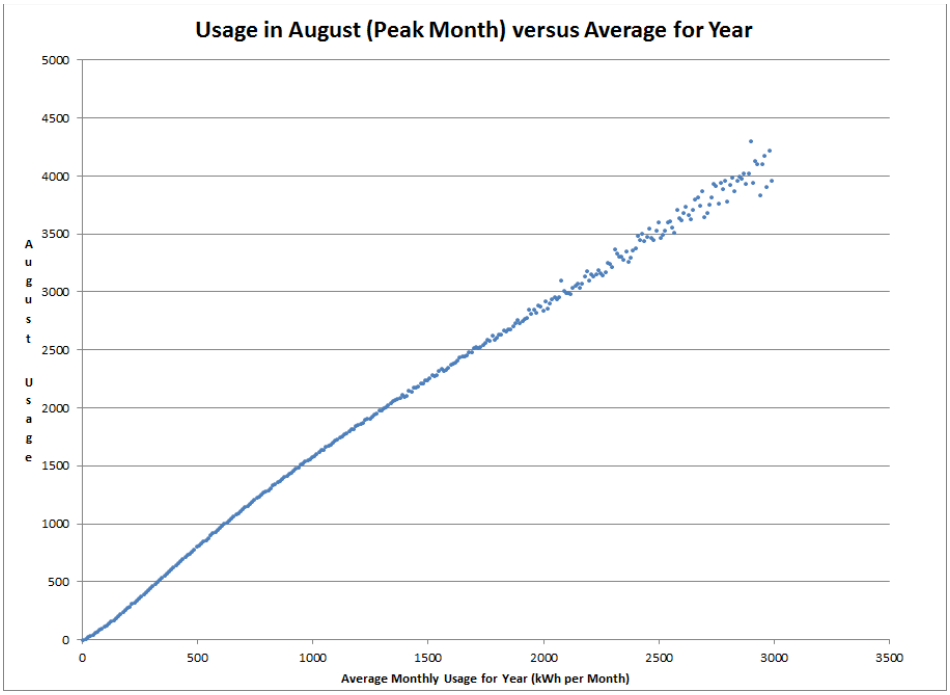
Q. At lines 74-84 of her rebuttal, Ms. Brinkman defends the ComEd usage study (ComEd Exhibit 2.33) because it uses "extensive data" and "includes four charts" for "each of several hundred zip codes." Is her defense of the study valid?

A. No. It is true that ComEd presented a lot of data and charts in its Exhibit 2.33. However, given the propositions the Company is attempting to support – e.g., that bigger homes do

not have both more usage and peak demand than smaller houses – the manner in which ComEd analyzed the data fails to support those propositions. ComEd has thrown together a lot of data, then asserted that there is no relationship between usage and demand, a conclusion supported only by anecdotal stories about vacation homes or people moving and leaving a house or apartment with low electricity usage during a vacancy period. ComEd offers such anecdotes about outliers (e.g. vacation homes) as proof of its propositions for a much larger universe of ratepayers. That approach cannot be accepted as an objective analysis.

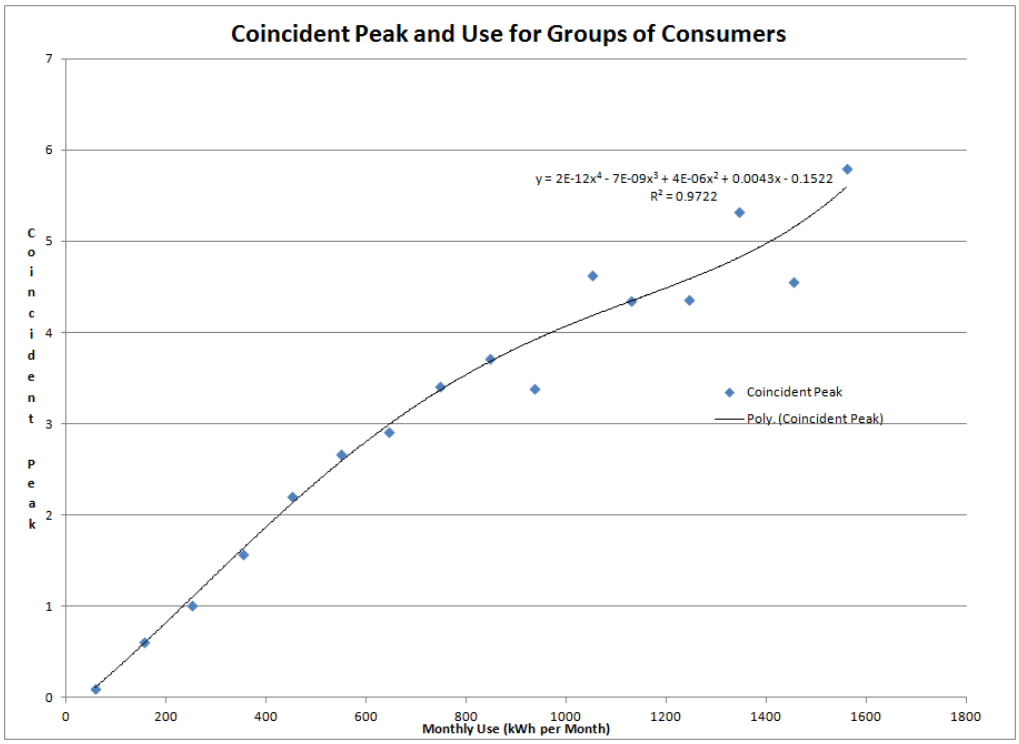
Since submitting my direct testimony, I have been able to analyze in detail a more complete collection of ComEd's usage data and load research data. When objective statistical analyses rather than anecdotal anomalies are used, there is no empirical basis upon which it is possible to conclude that any actual usage or demand whatsoever is related to the presence of a customer account. That key conclusion of this report is illustrated in the two graphs below. (My analysis is described in detail in City/CUB Exhibit 2.1 titled **Correlation Between Usage and Demand**.) The first graph compares residential consumer usage over the year to usage in the peak month of August by small 10 kWh increments of usage. The graph illustrates two key facts that confirm no usage can be attributed to the presence consumer accounts. First, the correlation of 99% is very high, suggesting there is little to be explained by anything else. Second, usage does not cross the y-axis at a positive level, which would occur if some peak demand were correlated to the mere existence of a factor (like the number of consumer accounts) independent of usage. Exhibit 2.1 explains in detail how the analysis was developed and why the conclusions are appropriate.

FIGURE - CORRELATION OF USAGE AND PEAK MONTH DEMAND



The second graph below applies load research data to compare usage during the coincident peak hour for the ComEd system to average usage for larger, 100 kWh increments of usage. As with the above graph, this second graph shows a very high correlation of 97%, suggesting there is little to be explained by factors other than usage. Further, the second graph also does not cross the y-axis at a positive level, which would occur if some of the coincident peak demand was correlated to the mere existence of a consumer account, independent of usage.

FIGURE - CORRELATION OF USAGE AND COINCIDENT PEAK DEMAND



Q. When commenting on your testimony at lines 152-157 Ms. Brinkman implies that your proposals are not cost based. Is this characterization of your testimony correct?

A. No, this characterization is completely false. I repeatedly testified that low use residential consumers have lower costs than high use consumers. That testimony included an illustrative recounting of observations made with my Uncle Gerald, an analysis (using ComEd's own data) correlating distribution cost responsibility with usage (sometimes using City/non-City costs to show the relationship of costs for low/high usage ratepayers), and a demonstration that because of the density of City of Chicago ratepayers (compared to other regions) the miles of lines per ratepayer (a portion of their cost responsibility) are dramatically lower in the City than outside of the City. One of the

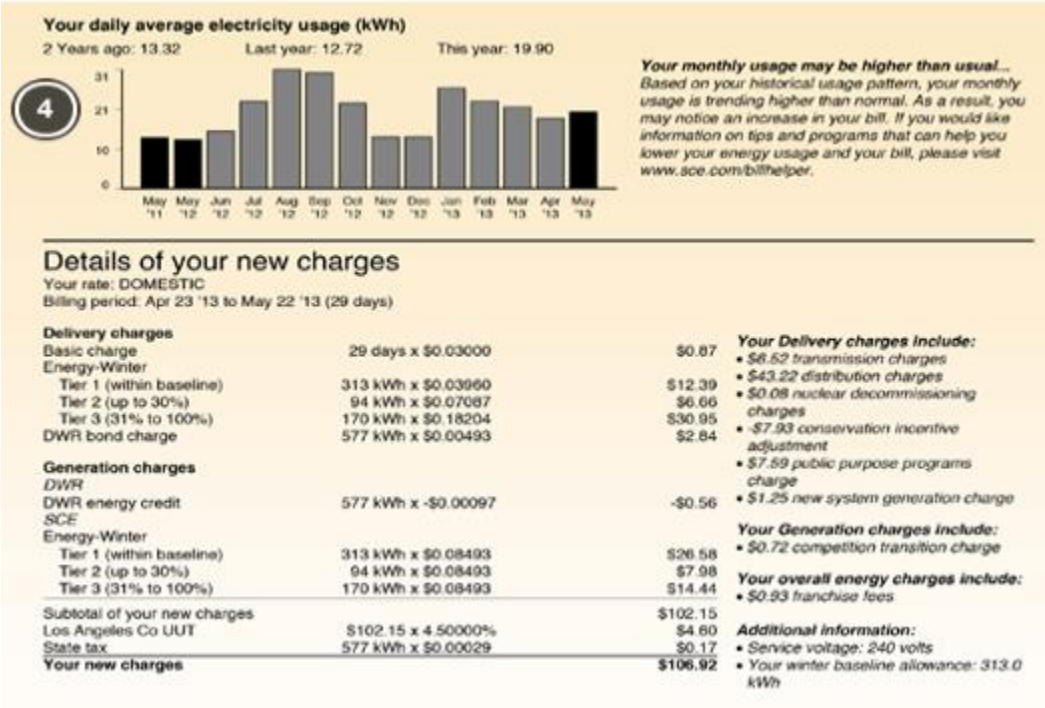
numbers that demonstrated the dramatic, lower cost is cost responsibility in terms of cost per ratepayer. That cost responsibility is only 6.95 miles per 1000 ratepayers for distribution lines inside the City while it is 25.96 miles per ratepayer outside of the City; those lower costs should result in lower prices for low users. In terms of the cost responsibility of poles, the numbers are similar. There are .81 poles per ratepayer in the City while there are 2.85 poles per ratepayer outside of the City, even though there is more undergrounding in the outside City regions. These cost differences are reflected in my tiered customer charge proposal.

Q. Even though your proposal is cost based, could there be factors that could over-ride the results of a cost analysis when designing rates?

A. Yes. It is clear from a review of rate designs for other utility companies in the U.S. that policy considerations involving encouragement of energy efficiency and distributed generation sometimes take a front seat. For example, the excerpt of a consumer bill on the website of Southern California Edison[2] shows that if you use higher amounts of electricity your bill dramatically increases – much more than in my tiered customer charge proposal. In the delivery charges section of that bill, the account charge is only .67 cents per month. The energy charge for the first 313 kWh per month is $.0390 per kWh. It then jumps to $.07087 per kWh for the next 94 kWh and it leaps to $.18204 per kWh for the remaining kWh used. If I had this rate structure I would be obsessive about turning off the lights, keeping the air conditioner off as much as possible, buying appliances that do not waste electricity, and efficiently using my clothes dryer.

[2] https://www.sce.com/wps/portal/home/residential/rates/!ut/p/b1/p

373 **FIGURE - SOCAL EDISON BILL EXCERPT**



Your daily average electricity usage (kWh)

2 Years ago: 13.32 Last year: 12.72 This year: 19.90

4

31
21
10
0

May '11 May '12 Jun '12 Jul '12 Aug '12 Sep '12 Oct '12 Nov '12 Dec '12 Jan '13 Feb '13 Mar '13 Apr '13 May '13

Your monthly usage may be higher than usual...
Based on your historical usage pattern, your monthly usage is trending higher than normal. As a result, you may notice an increase in your bill. If you would like information on tips and programs that can help you lower your energy usage and your bill, please visit www.sce.com/billhelper.

Details of your new charges

Your rate: DOMESTIC
Billing period: Apr 23 '13 to May 22 '13 (29 days)

Delivery charges		
Basic charge	29 days x $0.03000	$0.87
Energy-Winter		
Tier 1 (within baseline)	313 kWh x $0.03960	$12.39
Tier 2 (up to 30%)	94 kWh x $0.07087	$6.66
Tier 3 (31% to 100%)	170 kWh x $0.18204	$30.95
DWR bond charge	577 kWh x $0.00493	$2.84
Generation charges		
DWR		
DWR energy credit	577 kWh x -$0.00097	-$0.56
SCE		
Energy-Winter		
Tier 1 (within baseline)	313 kWh x $0.08493	$26.58
Tier 2 (up to 30%)	94 kWh x $0.08493	$7.98
Tier 3 (31% to 100%)	170 kWh x $0.08493	$14.44
Subtotal of your new charges		$102.15
Los Angeles Co UUT	$102.15 x 4.50000%	$4.60
State tax	577 kWh x $0.00029	$0.17
Your new charges		**$106.92**

Your Delivery charges include:
- *$6.52 transmission charges*
- *$43.22 distribution charges*
- *$0.08 nuclear decommissioning charges*
- *-$7.93 conservation incentive adjustment*
- *$7.59 public purpose programs charge*
- *$1.25 new system generation charge*

Your Generation charges include:
- *$0.72 competition transition charge*

Your overall energy charges include:
- *$0.93 franchise fees*

Additional information:
- *Service voltage: 240 volts*
- *Your winter baseline allowance: 313.0 kWh*

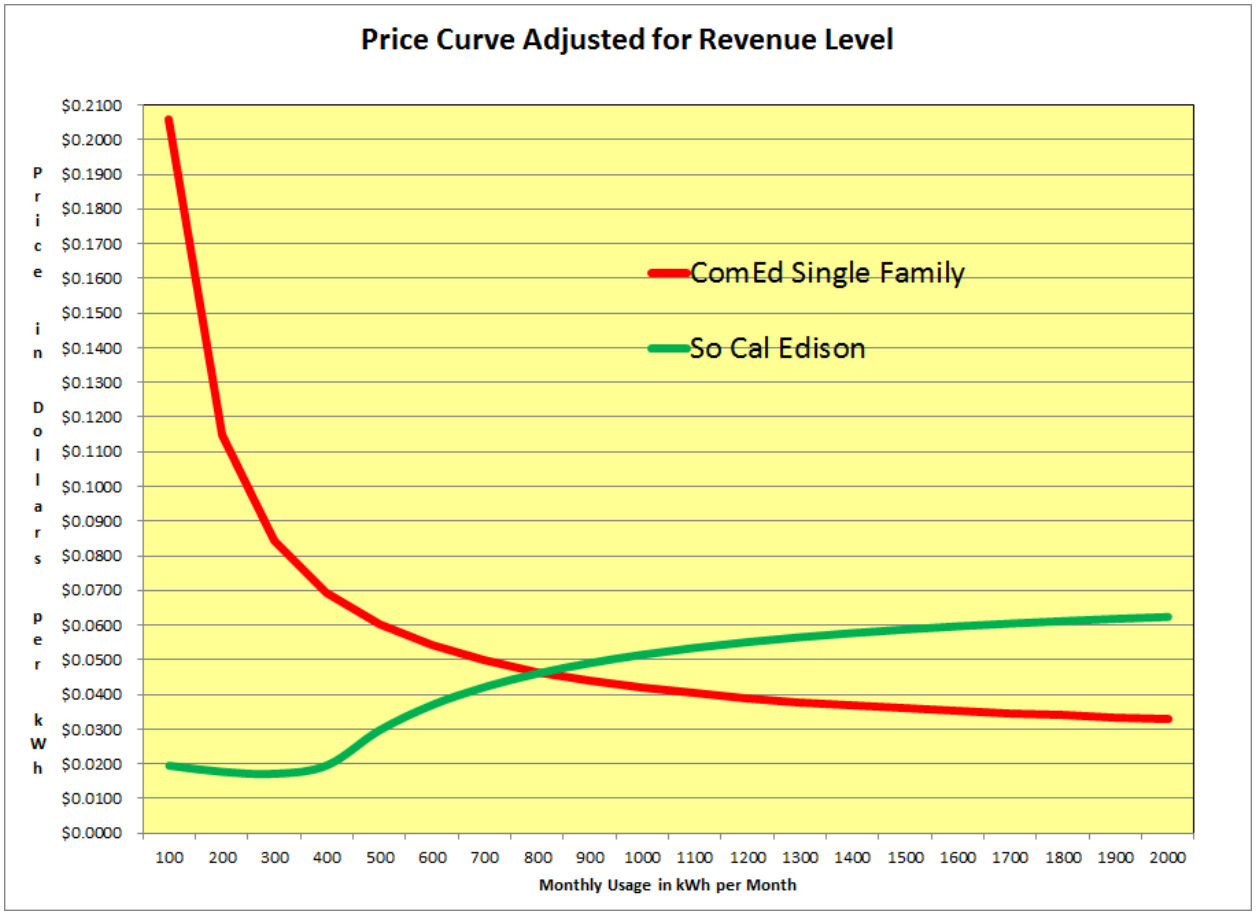
374 **Q. Can you compare the rate design for Southern California Edison delivery service**
375 **rates to ComEd's rate design, in terms of encouragement of energy efficiency and**
376 **regressiveness?**

377 A. Yes. To evaluate the structure of rates for different utilities, compared to ComEd's, I
378 have computed the electric bill per kWh for various levels of usage. I made this
379 calculation for the ComEd single family rate and for the corresponding residential rate of
380 the comparison companies. After computing the average price per kWh at various levels
381 of usage, I evaluated the total level of revenues generated by the rate design of the
382 comparison company and compared it to the level of revenues generated by ComEd's
383 rate design. The delivery service tariff components of the comparison company (in this

case Southern California Edison) were then increased or decreased so that I could present graphs that focus on the slope of the price curve. Further details of my calculations are described in City/CUB Exhibit 2.2

The graph below compares the rate designs for ComEd and for Southern California Edison. It shows that while ComEd has a very steep downward sloping curve (lower price at higher usage), the Southern California Edison curve is upward sloping (higher price at higher usage). The curve for Southern California Edison strongly encourages energy conservation, roof-top solar power installation and other energy efficiency measures, while the ComEd rate design does the opposite. Given the detrimental effects on the environment from generation, transmission, and distribution of electricity, as well as the mandates on energy efficiency from the State Legislature, there is little doubt that most serious policy makers would support the Southern California Edison structure rather than the ComEd structure. Finally, the shape of the Southern California Edison structure corresponds to cost of service patterns for ComEd, as shown by the usage to density, age, overhead lines, and cost correlations discussed above.

FIGURE - PRICE CURVE COMPARISON



City/CUB Exhibit 2.2 includes a similar graph for each utility company that serves one of the largest 20 metropolitan areas in the U.S. Comparing the slope of the ComEd single family rate to that of each of the other companies, not one utility company has a steeper downward sloping price curve than ComEd. In each and every case shown in City/CUB Exhibit2.2, the red line for ComEd has a steeper downward slope than the comparison utility. It is from this consistently steeper downward slope that I conclude that ComEd should receive a solid "F" grade in terms of encouraging energy efficiency. This certainly conflicts with the energy efficiency objectives of the State Legislature. Further,

given the fact that income is closely correlated with usage, one can also state that ComEd has the most regressive rate structure.

Q. At lines 164-179 of her testimony Ms. Brinkman complains that ComEd's revenues are not absolutely fixed and guaranteed. What does her statement signify to you?

A. Ms. Brinkman's statement reveals why ComEd would design rates that have the effect of making electric bills to low income and low use ratepayers as high as possible. Given how her statement reveals ComEd's objectives, I have repeated it below.

> EIMA in no way assures ComEd's full revenue requirement will be recovered. An appropriate cost allocation and rate design [i.e. SFV] will provide ComEd with a better opportunity to recover its Commission approved revenue requirement….Mr. Bodmer's claim fails to acknowledge that EIMA, by its own terms, contains sunset provisions. Consequently, even if EIMA ensured ***revenue stability*** – and it does not – EIMA does not provide the ***long-term revenue stability*** that Mr. Bodmer claims. (emphasis added)

This statement is very informative; it allows the Commission to understand the Company's motivations in rate design and cost allocation. First, ComEd's ratepayers should not have to endure unjust and unreasonable rates for a decade simply because of ComEd's fear that its formula rates will not be extended. Second, any pretense about rate design being a "zero sum game" about which ComEd is neutral is false. Similarly, any statement that ComEd is indifferent to various rate designs as long as it can collect its revenues is also false. (See the direct testimonies of Ms. Brinkman and Mr. Tenorio.)

It is important that the Commission fully understand the implications of Ms. Brinkman's testimony and how the Company's revenue stability objective creeps into all areas of its cost of service study and rate design recommendations. ComEd's ECOSS has thousands of costs, allocation factors, functionalization routines, and other items. The

data come from many more thousands of detailed account entries in the ComEd books, where classification of costs for accounting can be quite subjective. Given ComEd's corporate objective to reduce risk, it is not at all surprising that so much of its cost of service ends up in "customer related" items that are allocated to the customer charge. For example, a lot of the consulting fee paid to ComEd's consultant Mr. Hanser to respond to my testimony would end up in the customer charge. Similarly, the cost of preparing ComEd's Exhibit 2.33, which attempts to prove that usage and demand are not correlated, will also end up in the customer charge.

ComEd performs all of the accounting that produces costs that end up in the ECOSS the company performs, and ComEd controls all of the data. Given Ms. Brinkman's expression of the ComEd corporate perspective on revenue stability, the Commission cannot reasonably assume that ComEd's subjective decisions in recording and allocating costs will be objective. It is more likely (if one assumes ComEd will act in its economic interests) that any time the Company can call a cost "customer related" it will. When the Company's analysis suggests that 50% of the costs for multifamily ratepayers are related to metering and "customer care," the Company's bias in favor of a customer related designation for its costs becomes clear. Given ComEd's corporate objective, it is not surprising that the company has such a regressive rate design. This means that even if the SFV is rejected, ComEd will remain an outlier because of other policies that push costs into the "fixed" category that it treats as "customer related."

Through Ms. Brinkman's statement, the Company has revealed a desire be virtually risk free. From ComEd's perspective, allocating demand/distribution costs on the basis of customer accounts (notwithstanding the absence of any correlation) allows the

utility to claim that its rates are cost based, while gaining more revenue assurance. ComEd already earns a very hefty risk premium of about 6% in its formula rates, despite the assurances of formula rates and revenue requirement reconciliations. The question raised by Ms. Brinkman's testimony is whether the Commission must also adopt a rate design policy that dramatically discourages energy efficiency to provide even more certainty for ComEd. I hope that as a reasoned arbiter, the Commission will focus instead on actual cost of service responsibility and policy considerations important to ratepayers and society, rather than further assuring ComEd's revenue stream.

Before considering revenue stability objectives, I believe the Commission should make sure that the rate structure (1) corresponds to cost of service (where cost of service recognizes the effects of density, age and other factors); (2) does not discriminate against low income consumers, and (3) does not discourage the energy efficiency mandated by State Legislature policy. As demonstrated in my direct testimony, my tiered customer charge proposal (which does not increase usage charges relative to ComEd's rate design) advances these three objectives -- cost-based rates, non-regressive rate design, and encouraging energy efficiency – while accommodating ComEd's revenue stability objective.

RESPONSE TO REBUTTAL TESTIMONY OF MR. CHARLES TENORIO

Q. Does Mr. Tenorio seem to understand your proposal?

A. No, it appears that he does not understand at all what I am proposing. One example of his misunderstanding of my testimony occurs at lines 106-107 of his rebuttal, where Mr. Tenorio wrote:

> "[I]t appears that Mr. Bodmer proposes to significantly lower customer charges for **all** residential customers." (emphasis added)

Later, at lines 250-253, he makes this statement:

> From his testimony, it appears that Mr. Bodmer opposes the use of the 50/50 SFV rate design and favors a rate design with much lower fixed charges and higher variable charges, which would result in overall unitized per kWh charges that are lower for low use customers (City/CUB 45:672-673). (emphasis added)

Mr. Tenorio's comments make me scratch my head. Over and over again, I stated that my proposal involves restructuring the fixed account charges to address ComEd's revenue stability concerns while basically leaving energy charges alone. The only change in the energy charge involved changes to reflect a re-allocation of costs that ComEd's defines as "customer related" Other than this minor change, which increased the energy charge in the single family class and reduced the energy charge in the multi-family class, my proposed changes were all in the structure of the fixed account charge. I stated that my proposal changes the customer charge and not the energy charge at the following places in my direct testimony:

> Line 132: "I propose a cost-based, revenue neutral, set of tiered monthly customer charges that vary to recognize the correlation between usage and key cost drivers."

> Line 140: "The customer charge would continue to gradually increase for each 100 kWh per month increment in prior year average monthly usage…. The break-even occurs at a usage level of 750 kWh per month."

> Line 149: "The total dollar amount collected from customer charges in my proposal would be exactly the same as the amounts collected using the current rate design. The only differences are (1) that revenues from customer charges would be collected from graduated charges rather than a uniform charge and (2) the allocation of costs that ComEd treats as customer related is corrected."

> Line 1339: "The data and my analyses show that low-users have characteristics that make the simple structure of a single account charge and a single energy charge inequitable and demonstrate that ComEd's rate design must be restructured to include a graduated account charge."

> Line 1359: "Use billing determinants separated by usage increment to derive a series of customer charges that produce the same level of revenues …."

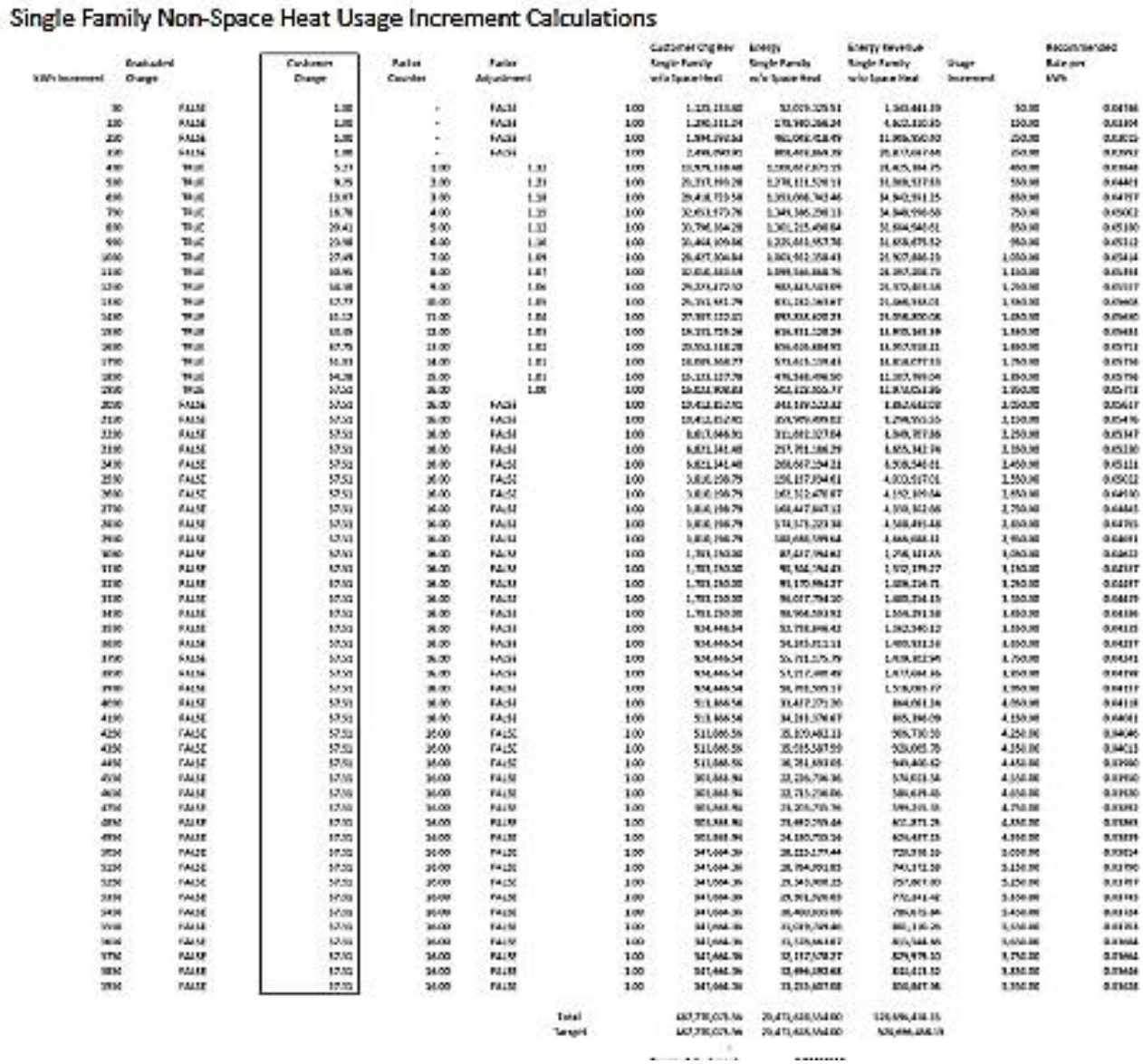
If Mr. Tenorio could not understand my proposal from the above references in my direct testimony, he could have looked at City/CUB Exhibit 1.1. There I showed that customer charges could rise to almost $60 per month for the highest use ratepayers and that the energy charge would not change. I have included a couple of excerpts that demonstrate this below:

FIGURE - CUSTOMER CHARGE/ENERGY CHARGE REVENUES SPLIT

Step 4: Split Total Revenues Between Customer Charge and Energy Charge

		Single Family w/o Space Heat	Multi Family w/o Space Heat	Single Family w/ Space Heat	Multi Family w/ Space Heat	Total Residential
ComEd Desired Customer and Meter Charge	USD/Month	18.21	10.97	20.30	11.94	
Bills	Number	26,785,836	12,498,048	419,988	1,912,188	
Total	USD	487,770,074	137,103,587	8,525,756	22,831,525	656,230,941
Reduced from Re-allocation	USD		(54,725,949)			
Net Collections	USD	487,770,074	82,377,638	8,525,756	22,831,525	656,230,941
Collections from Energy Charge	USD	528,696,458	134,334,856	15,393,552	27,418,047	705,842,914
Energy	kWh	20,471,628,554	4,425,830,554	750,453,895	1,593,009,493	0
Energy Charge	USD/kWh	0.0258	0.0304	0.0205	0.0172	
ComEd Energy Charge	USD/kWh	0.0238	0.0310	0.0114	0.0143	

520 **FIGURE - RANGE OF POSSIBLE TIERED CUSTOMER CHARGES**


Single Family Non-Space Heat Usage Increment Calculations

521 If ComEd's witnesses did not read my testimony, then they should not have bothered to
522 submit rebuttal testimony.

523 **Q. Mr. Tenorio repeats a "finding" of the residential usage study that some low use**
524 **consumers are located in close proximity to high use consumers (Lines 329-339). Is**

this finding surprising or important, with respect to whether distribution costs should be priced on the basis of the number of accounts?

A. Not at all. Much of the residential usage study presents tables and charts that show that zip codes can have both high and low usage accounts in a particular month. Mr. Tenorio apparently thinks this is so important that he has copied and pasted statements and tables related to the variation in usage from Exhibit 2.33 into his rebuttal testimony. Among the statements that he copied were the following (lines 329 to 334):

> "[I]n comparing the lowest to the highest percentile customers . . . there were numerous instances in which the address for a customer in Percentile 1 was in the same hundred block and street as the address for a customer in Percentile 100. For some multi-family accounts there were Percentile 1 customers literally either across the hall or next door to Percentile 100 customers."

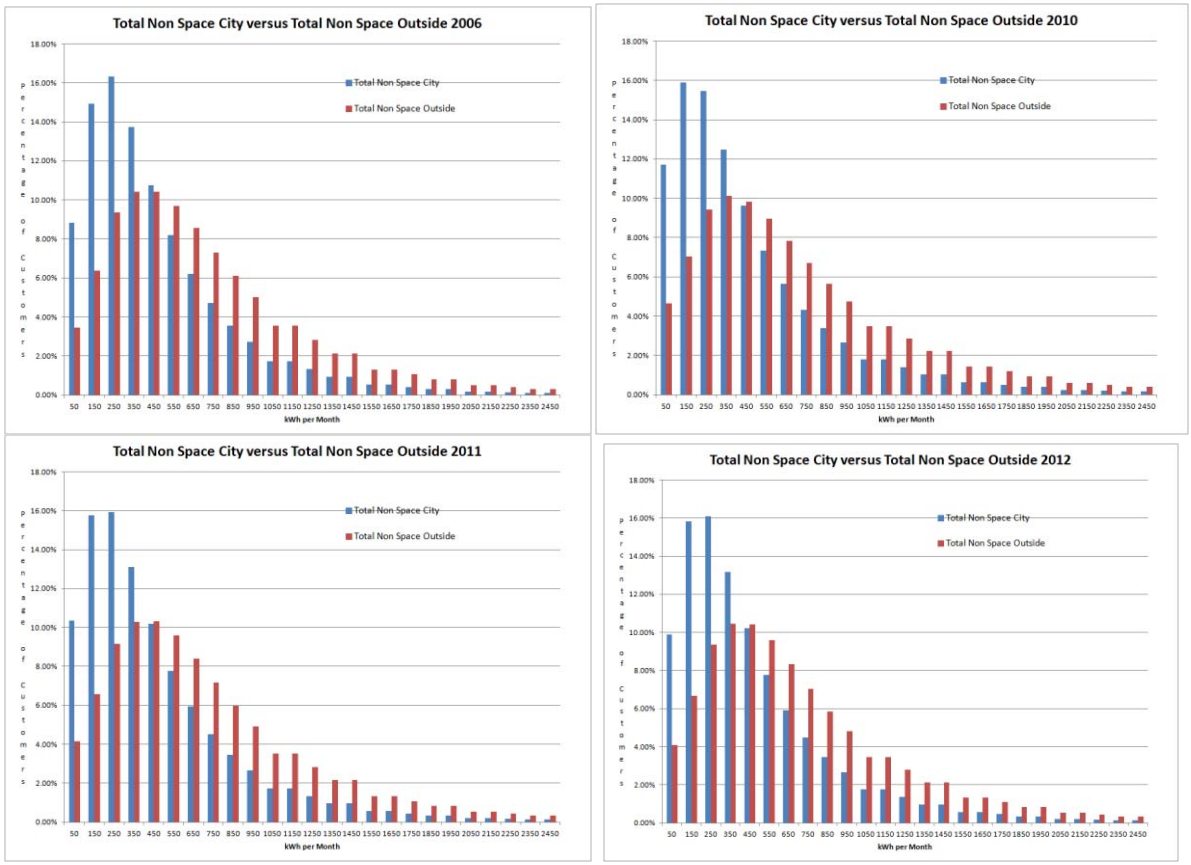
After copying this statement from the usage study, Mr. Tenorio presents a table showing that many zip codes had consumers in both the lowest percentile and the highest percentile.

When looking at the table and reading the ComEd statements, one would think that it is common in the Chicago area to see mansions located next to apartment buildings where low-income/low use consumers live. Alternatively, ComEd seems to imply that a studio apartment in the City can suddenly use as much electricity as a large home in Kenilworth and ComEd needs to prepare for that possibility. Because he believes a studio apartment can suddenly use as much energy as a large mansion, Mr. Tenorio asserts that energy usage does not drive distribution cost. In fact, ComEd's analysis of variation in usage does not really demonstrate anything at all. ComEd has mis-interpreted its own data and derived incorrect conclusions.

- The probable reason that usage varies in the way ComEd reports is that people take vacations and people move. When the neighbor of a high user living in a large mansion in Lake Forest moves or the home-owning family takes a trip to Paris, the usage next door can suddenly fall to almost nothing. City/CUB Exhibit 2.1, in the section titled "Sudden Changes in Usage and Demand from Consumer Vacancies and the Load Research Data," examines the load research data to demonstrate how the load of a single family home or an apartment can suddenly fall because of moving and/or vacations.
- When people move or take vacations and the usage at an address declines for a particular month, this in no way implies that peak demand and distribution costs can be correlated with the presence of a ratepayer account rather than usage. If a family living in a large mansion takes a vacation, that home still requires more distribution equipment than a studio apartment that is vacant because the former renter has moved out. I discuss this point in a more formal way in City/CUB Exhibit 2.1 and present a proof that vacation homes and vacancies from residents moving do not affect the basic correlation and relationship between usage and demand.
- In discussing its finding that zip codes can have both high and low usage residents, ComEd suggests that usage in a particular region can vary dramatically. Data provided by ComEd demonstrate that this is not the case for the City and outside regions of the service territory. The four graphs below that compare the City and outside City usage distributions for 2006, 2010, 2011 and 2012 (years of data provided by ComEd). Data for the four different years demonstrate that the relationship between usage and regions is very stable and that the City has a

consistent pattern relative to other parts of the service territory. The City consistently has lower usage than the outside City (of course there are some high users in the City which seems to be a big deal for ComEd). As with the other points, the stability of usage is discussed in City/CUB Exhibit 2.1.

FIGURE - REGIONAL USAGE COMPARISONS



- Finally and most importantly, if ComEd truly wants to assess the relationship between usage and demand, ComEd does not have to go further than directly performing a correlation analysis. It does not need any of the percentile analysis presented by Mr. Tenorio. A proper correlation analysis, which is fully described in City/CUB Exhibit 2.1 and summarized in the two correlation graphs above,

583 demonstrates that ComEd's finding regarding variation in use does not have any
584 meaningful effect on the larger issue of the relationship between usage and peak
585 demand.

586 **Q. The main focus of Mr. Tenorio's rebuttal to your direct testimony regarding the**
587 **usage-demand correlation appears to center on load factors. Is that testimony**
588 **relevant to the cost allocation and recovery issues you raised?**

589 A. No, it is not. Mr. Tenorio computes the load factors used in his analysis and testimony on
590 an individual consumer basis (where, for example, the peak load of a particular consumer
591 may occur in April or December). But peak loads for individual consumers have nothing
592 at all to do with the class cost of service approach ComEd uses to set its rates. In
593 ComEd's cost of service study, all primary facilities costs are allocated on the basis of
594 coincident peak and certain other costs are allocated on the basis of load measured on a
595 non-coincident, class-wide basis. These latter measures of peak load capture the effects
596 of the diversity of ratepayer usage within a class. The peak loads of individual
597 consumers are not comparable. Yet, Mr. Tenorio asserts that his analysis somehow
598 invalidates my conclusions about the relationship between distribution cost of service and
599 residential ratepayer usage. When Mr. Tenorio's analysis is corrected to reflect the
600 coincident peak load factor or non-coincident peak load factors used in the study used to
601 set its rate, the results provide no basis for his assertion that load factor increases with

usage. In fact, the coincident peak load factor for City residential ratepayers is 23% better than the outside City load factor, even though City rates are 18% higher.[3]

Q. Please comment on Mr. Tenorio's load factor graphs, which seem to suggest that load factor improves (or usage becomes more efficient) as usage becomes larger?

A. Those charts show a load factor trend line that increases with usage. In introducing his load factor charts, Mr. Tenorio presents a formula for the load factor. What Mr. Tenorio does not tell us is whether his load factor is computed on the basis of individual billing demand, coincident peak demand, or class demand. That choice is crucial in the definition and the interpretation of a load factor for rate design and rate setting purposes.

After going through Mr. Tenorio's workpapers, I have verified that he uses the demand of an individual consumer (no matter when her highest demand occurs) as the basis for defining peak load. This means that for one consumer the peak demand could occur in April, while for another the peak demand could occur in October. The relevant peak demand for purposes of cost causation, however, is only that occurring when the system (on a regional basis) reaches its peak. The peak demand used in allocating most costs in ComEd's ECOSS is the system peak. In City/CUB Exhibit 2.1, I explain that the load factors computed by Mr. Tenorio using individual instead of system or class peaks has no relevance whatsoever in the ComEd cost of service analysis. In that exhibit, I show the different dates of the individual peaks Mr. Tenorio uses to produce his graphs.

When the relevant load factors -- computed from coincident peak or from class peak -- are used in computing the load factor, the results are very different from those

[3] As I explained in my direct testimony, given the available data, using the City as a proxy is an effective way to look at the cost characteristics of low use consumers.

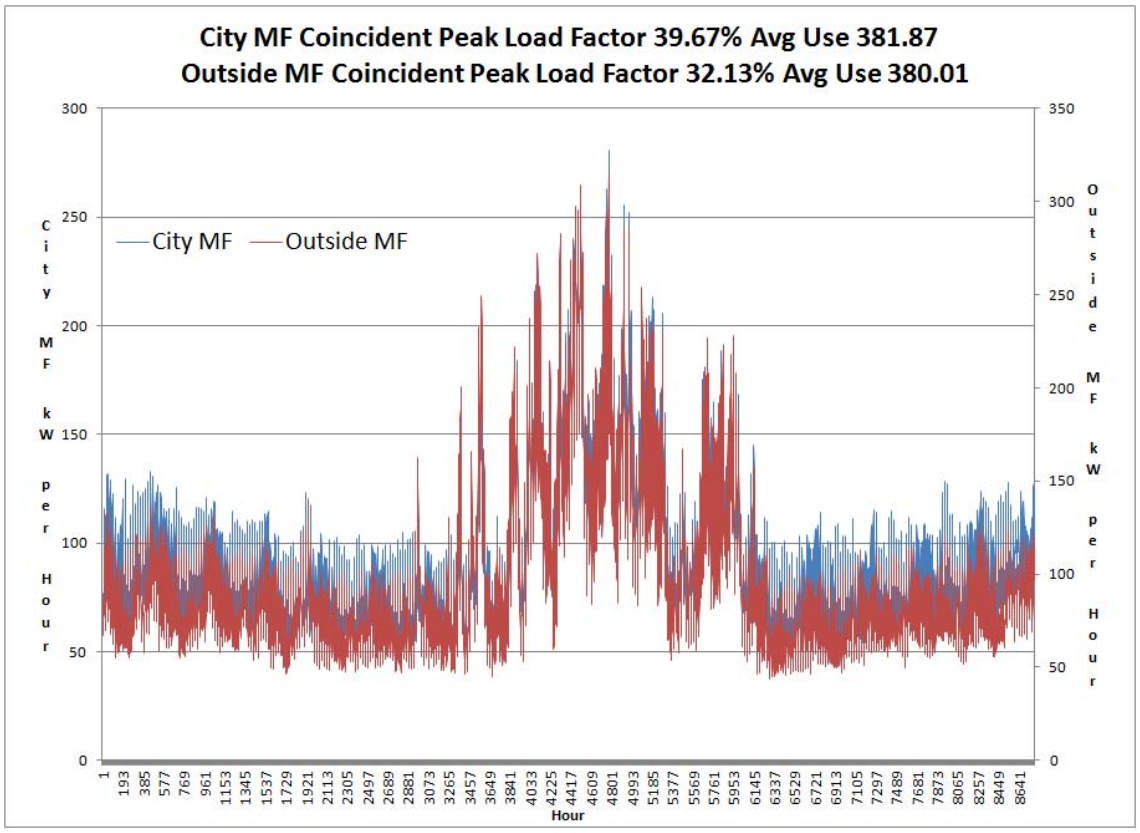
presented by Mr. Tenorio. The most important load factor is calculated using coincident peak load, as it is the primary driver of cost allocations in ComEd's cost of service study. Implications of the different load factors are discussed in Exhibit 2.1, which explains why the coincident peak load factor is most relevant. Another possible load factor uses the class peak, but that load factor has much less to do with how actual demand/distribution costs are incurred, since they are driven by regional demand from all rate classes. ComEd's data show that, for the single family non space heat class, the class peak is virtually the same as the coincident peak -- it occurs one hour later. (The class load factor is used as a basis to allocate secondary costs in the ECOSS).

The least relevant load factor is the load factor computed by comparing the average usage of a consumer to his own peak use. This load factor ignores load diversity and any effect of diversity on ComEd's costs. Diversity is crucial in measuring costs for any ratepayer class, and it has always been a standard part of a cost of service analysis. The individual load factor is not used at all in ComEd's cost study. Yet, it is the one Mr. Tenorio chose to support his criticisms of my analysis. Using individual load factors in the context of this case serves no meaningful purpose. Mr. Tenorio's calculation merely diverts attention from the relevant facts, distorts the analysis of ComEd's cost and rates, and is irrelevant to the ECOSS and ComEd's rates.

In Exhibit 2.1, I present my computations of coincident peak load factors. In contrast to Mr. Tenorio's presentation, I explain (explicitly) the methodology for computing the load factors in City/CUB Exhibit 2.1. Load factor graphs shown in Exhibit 2.1 (and repeated below) demonstrate the following facts.

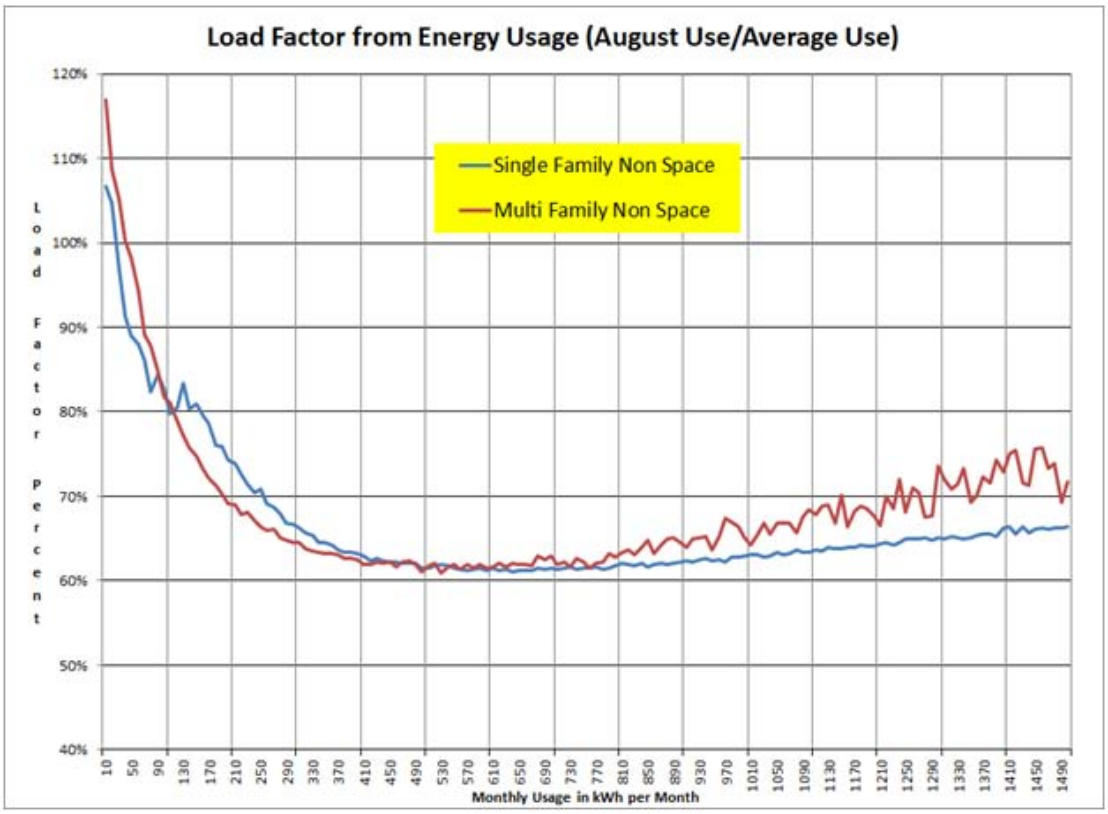
1. The coincident peak load factor for non-space heat consumers is higher inside the City of Chicago than outside the City of Chicago (in 2012 the coincident peak occurred at 5:00 PM on July 6th). For multi-family non-space heat consumers in the City it was 39.7% while it was 32.1% outside of the City. (Though ComEd did not have a reasonable sample of City consumers in the single family non-space heat class, the available data indicate that this City load factor also was higher.) The graph below illustrates the better load factor for multi-family consumers inside and outside the City of Chicago, as shown by the 2012 load research data provided by ComEd. A comprehensive set of graphs is included in City/CUB Exhibit 2.1. If one accepts the notion that distribution costs are driven by coincident peak demand -- as ComEd maintains -- this implies that rates should be 23% lower in the City of Chicago than outside city regions. Instead, actual residential prices for non-space consumers are 18% higher in the City than outside the City.

FIGURE - CITY/NON-CITY COINCIDENT PEAK LOADS



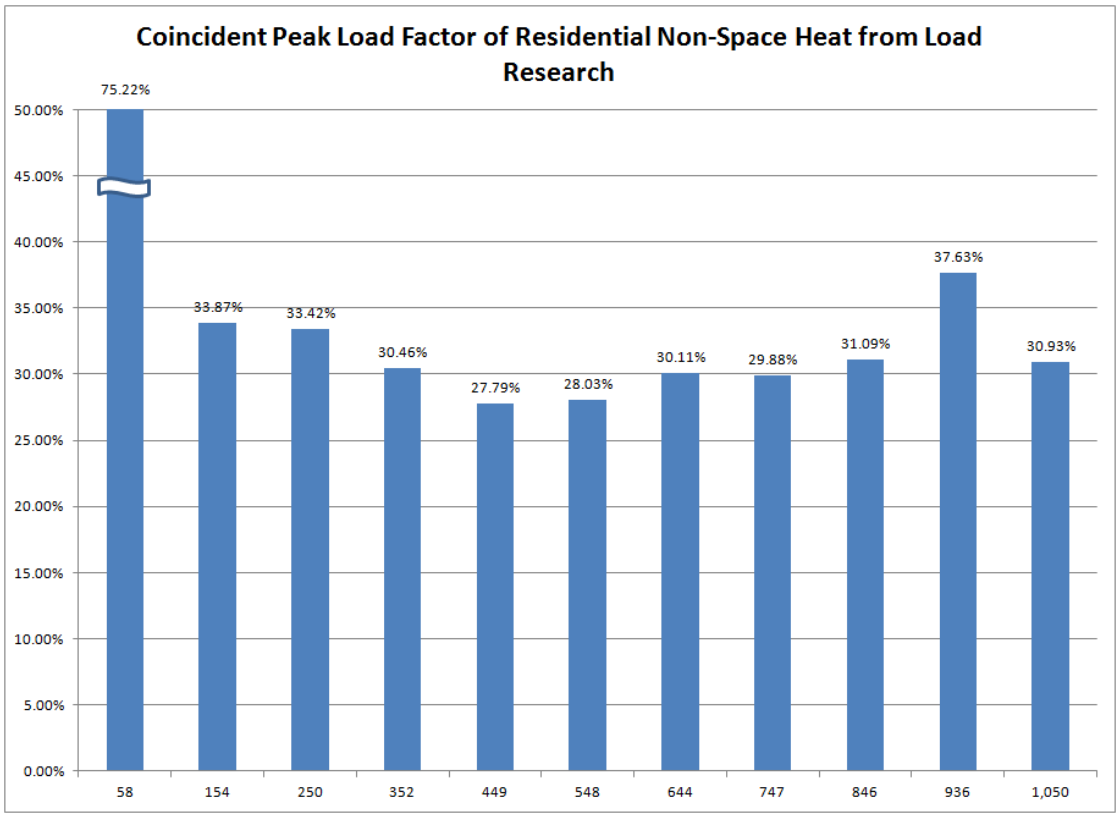
2. Based on the detailed 2010 usage data of more than a million accounts that was provided in response to an AG data request at the same time as the load research data, the load factor, as measured by highest monthly use relative to average use over the year, is better for low use consumers until the use reaches about 500 kWh per month. For monthly use above 800 kWh the load factor improves somewhat. Although this load factor uses usage for the entire peak month to represent pea load, it gives a much better indication of load factor than the statistic used by Mr. Tenorio.

668 **FIGURE - RESIDENTIAL CONSUMER LOAD FACTORS**



669 3. The load factor measured using coincident peak load for groups of non-space heat
670 residential consumers in ComEd's residential load research sample demonstrates
671 that coincident peak load factor is high for very low users. The load factor
672 declines until a usage level of about of 450 kWh per month and then increases
673 somewhat. The difference in the two graphs is explained by use of a single peak
674 number in the graph below and the sampling problems in ComEd's load research
675 data. The serious problems with ComEd's sampling are described in detail in
676 City/CUB Exhibit 2.1. The graph has a break for the lowest use category because
677 its load factor is so much higher than the other load factors and exceeds the
678 maximum vertical axis value.

FIGURE - RESIDENTIAL LOAD FACTORS BY USAGE LEVEL



Q. Is Mr. Tenorio's assertion that you rely on load factors to make the argument that low users have lower cost a correct?

A. Not at all. Mr. Tenorio states that I "appear to rely heavily on [my] often repeated opinion that 'low usage is closely correlated with… better load factors.'" Once again, this statement suggests that Mr. Tenorio did not read or understand my testimony. Load factor was only one of the items I examined that drive ComEd's distribution costs. Immediately after discussing load factor in my direct testimony, I presented statistical data on the correlations between density, age and undergrounding relative to usage. The data demonstrated that distribution cost responsibility per residential consumer for overhead lines and underground lines is less for low use regions than for high use regions. In measuring the cost responsibility per region for distribution facilities, the

level of peak demand and load factor does not come into the equation. Peak demand is used only for allocating costs among rate classes.

For years over the course of a number of rate cases, the City has tried to acquire data on the distribution costs per ratepayer for residential regions in the City of Chicago and analogous regions outside of the City. I understand from attending workshops that data on the age, quantity and cost of distribution facilities is available for very small regions of the service territory from the CGIS system. With this data we could measure, for example, the cost of serving consumers in Lake Forest and in Engelwood (using City of Chicago statistics on an aggregate basis is not useful for certain analyses because of distortions created by the Central Business District). If we could get this data – which is fully controlled by ComEd -- we could perform a detailed analysis of cost and usage and derive the cost per kWh for different usage level increments. This analysis would not require any information about ratepayer peak load, load factor or anything other than the cost and the usage. Unfortunately, ComEd once again refused to cooperate in such an analysis in this case as demonstrated by its non-response to data requests that attempted to obtain such data (see ComEd's response to COC 3.03).

Q. Mr. Tenorio states that your proposal is too complicated and "could cause confusion and consternation" for ratepayers. Can we compare your proposal to other proposals to evaluate whether his assertion is true?

A. Mr. Tenorio's claim is not true. Utilities frequently claim that any proposal other than their own will cause customer confusion and outrageous IT costs. Their own proposals are not scrutinized for similar effects. Here, my proposal would cause much less

consternation, at least among low use and low income ratepayers, than ComEd's Docket 10-0467 proposal to increase customer charges to more than $30 per month, which meant that rates for low use consumers would go up by 78%. That rate increase was on top of a big customer charge rate increase in the previous (2007) rate case. Before the 2007 case ComEd's multi-family customer charge was $2.94 per month City Exhibit 1.0 -- Corrected (Docket No. 07-0566 line 128). While a 78% increase would not cause much confusion for ratepayers, in my opinion it would certainly create consternation. As I wrote in my direct testimony, the actual increase in account charges caused an increase of 54% in delivery charges of low use City ratepayers. A graduated account charge, on the other hand, has an understandable tie to a consumer's cost-causing demand, and the tiers would create an understandable mechanism by which consumers could clearly see the effects of their energy efficiency activities.

Mr. Tenorio also suggests that under my proposal customer charges would jump around and that there would be wide variations in delivery charges to ensure revenue neutrality. (Lines 305 to 307). One would have to read less than ten pages of my testimony to see the words on line 141, page 9 which make it clear that a moving average of usage is used, in part, to minimize fluctuations in bills:

> 'The customer charge would continue to gradually increase for each 100 kWh per month increment in **prior year average monthly usage**." (emphasis added)

I also stated that the prior year moving average of usage could be weather normalized to address ComEd's revenue stability focus (see lines 1000-1001, 1081, 1097, 1102 of my direct testimony). Using a 12-month rolling average will avoid peripatetic movement among tiers, and the tiers are graduated (every 100 kWh), so moving from one

tier to the next would not mean a dramatic change in charges. In addition, since the tiers are cost based, the signals to consumers will not spur excessive conservation or energy efficiency, which appears to be the pre-occupation of Mr. Hanser.

Mr. Tenorio's comment about the supposed difficulty of designing revenue neutral rates is needless hand wringing. Using ComEd billing determinants, I created a revenue neutral rate design, which was presented in my direct testimony. In City/CUB Exhibit 1.1, I used the ComEd provided billing determinants to assure that my proposal generates the same revenues as those produced by its own rate design. I have no doubt that the Company – which has hundreds, if not thousands, of rate elements in its tariffs for which it calculates charges and taxes -- could work out the relatively simple calculations necessary to implement my proposal.

Q. Mr. Tenorio presents a number of charts and graphs that seem to suggest that implementation of the SFV system would lower customer charges for multi-family consumers. Does this make sense?

A. Of course not. The whole idea of the SFV was to increase customer charges and reduce energy charges by moving distribution costs from the energy charge to the customer charge. If implementation of the SFV somehow reduces customer charges, then either (a) ComEd's "fixed" costs are not really fixed at low usage levels, (b) there was something wrong with the way in which ComEd implemented the SVF after the last case, or (c) both. Instead of presenting a whole lot of tables and charts, Mr. Tenorio should explain the odd result from the multi-family class. As shown in my direct testimony, the multi-family energy charge is lower than the single family energy charge and the