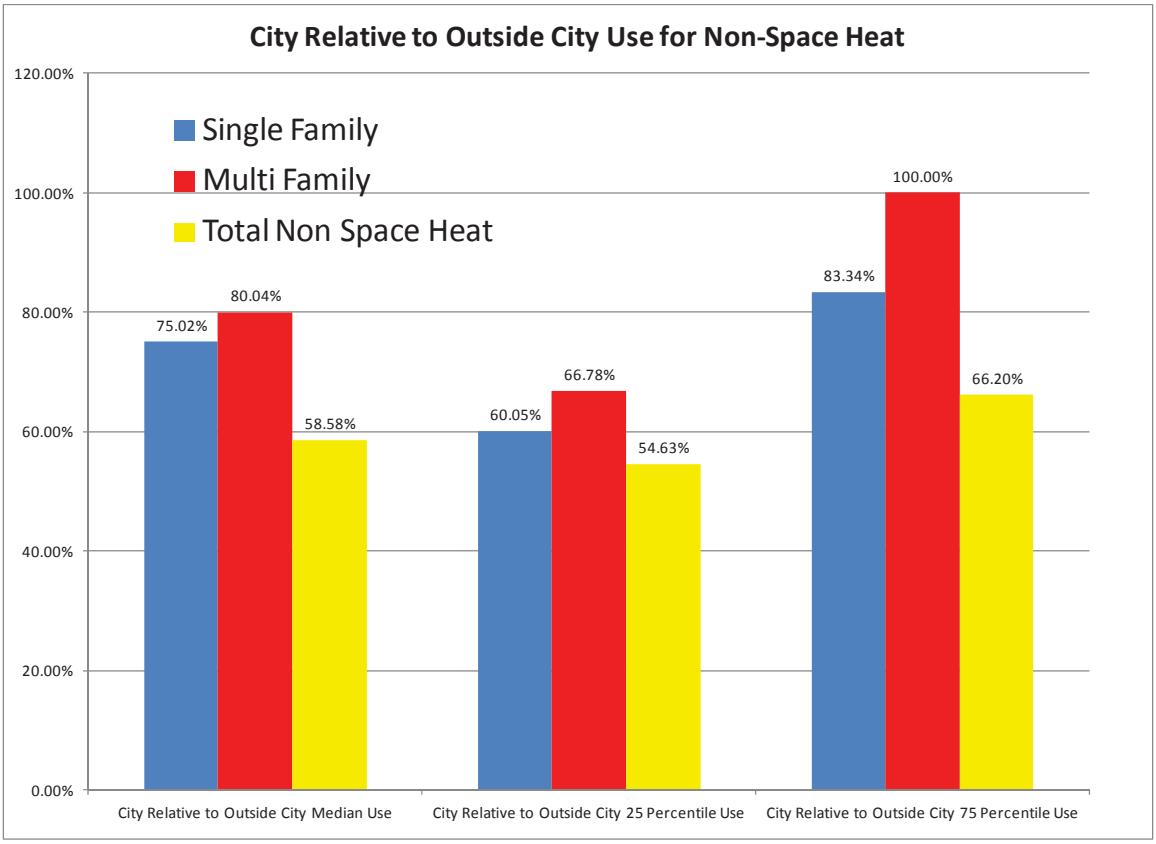
FIGURE 6-- CITY & NON-CITY USAGE



Q. Why does your comparison apply median figures instead of average usage?

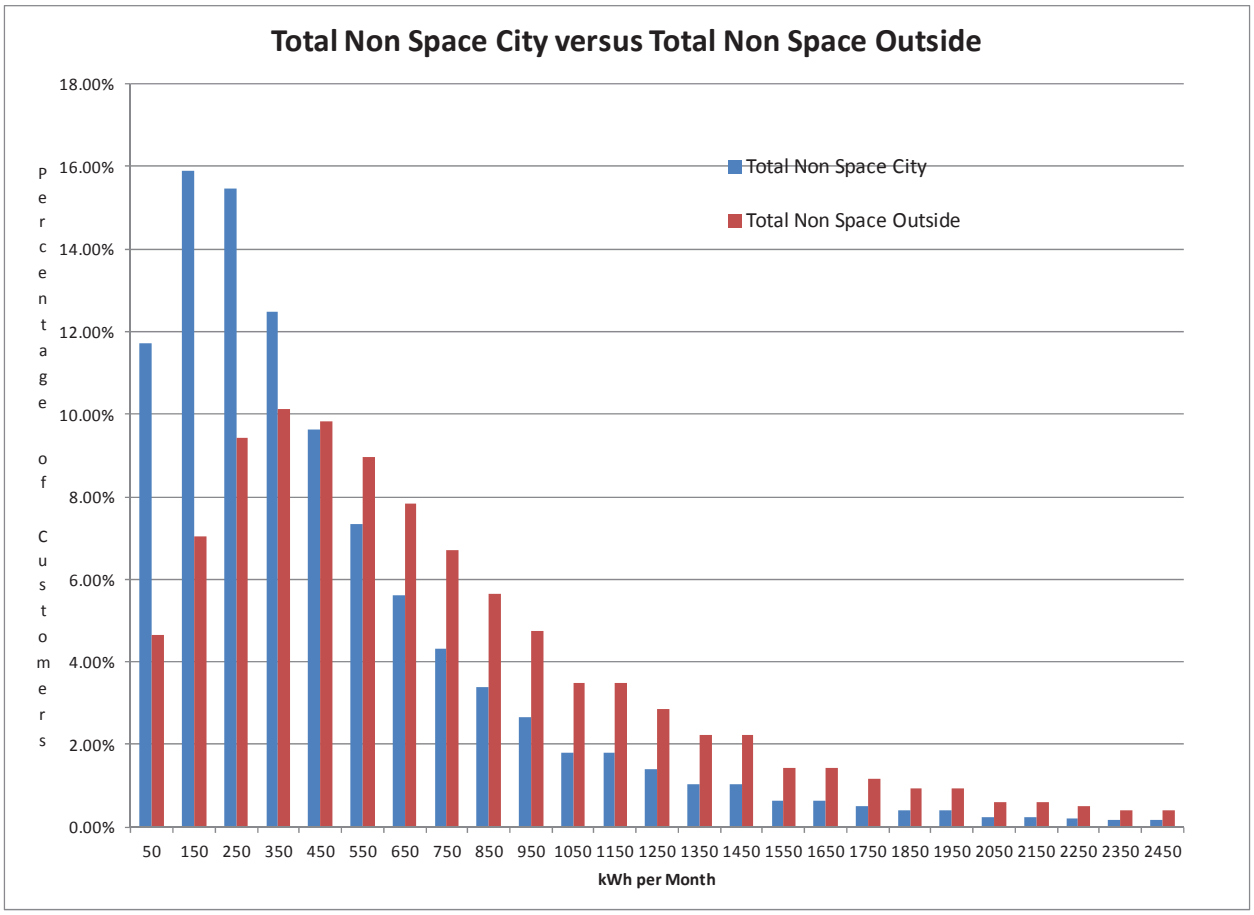
A. When examining usage for a group of consumers, median statistics should be used rather than averages. These statistical measures are usually offered in discussions of "typical" ratepayers. The median defines the statistical center of the group's range, and it is less affected by extreme outliers than averages. To illustrate the effects that make median measures preferable, consider three consumers: one who uses 100 kWh in a month; a second who uses 200 kWh; and a third who uses 300 kWh. In this case, the average (200 kWh) would equal the median and either would correctly define the middle of the identically spaced consumers' range of usage. If, however, the distribution of ratepayers

across the range of usage is not perfectly spaced but skewed, using the median is more important.

Consider a different group of three consumers where one uses 100 kWh per month, the second uses 200 kWh, and the third used 1200 kWh. In this case, the average (750 kWh) would greatly overstate typical usage, while the median would still correctly measure the middle value of 200 kWh. Therefore, when the Commission's 10-0467 Order stated: "The Commission also encourages ComEd to explore how it defines the low-use ratepayer sub-class." The median rather than the average must be the basis of that statistical analysis, since the latter erases all traces of where in the range of data points "typical" ratepayers are clustered, in favor of a mathematical redistribution of total usage.

The graph below shows the distribution of bills across the range of usage for single family ratepayers, inside and outside of the City. It is easy to see that bills for City residents are far more concentrated in the lower usage categories. Further, the distribution is clearly skewed, requiring that the median (rather than the mean or average) be used to define the typical ratepayer, to avoid misleading results like those illustrated above.

FIGURE 7- BILLED USAGE DISTRIBUTION



Q. Why is the diversity in use more important in designing electricity rates than for natural gas rates?

A. The wide diversity in usage requires more careful policy analysis for electricity than for gas rates, for the simple reason that there are three different natural gas distribution utilities, with distinct territories, in the Chicagoland area. Because revenue requirements are separately computed for Peoples Gas, North Shore Gas, and Northern Illinois Gas, the corporate barriers moderate the effect of rate structure changes in the natural gas industry, by constraining transfers of money (revenue requirement responsibility) between low-use and high-use consumers to smaller, distinct ratepayer groups.

Q. What has been the percent change in ratepayer bills with different usage profiles as a result of the changes in the pricing structure from the 10-0467 Order?

A. To illustrate the effect of increasing the account charge, which I think is clearly a part of the Commission directive that ComEd failed to address, I have computed the change in the electricity bills of various different consumer profiles since the rate increase that occurred as a result of the 10-0467 Order. The table below shows that increases since the 2010 case range from 53% for low-use consumers in the City to 24% for high use consumers outside of the City (again, the City is presented as an indicator of low use, not to argue for separate City rates). When the Commission wrote that ComEd should examine "possible disparate impact … on low-use consumers, especially in the Chicago region" I certainly think that an increase of 24% relative to 53% classifies as a disparate impact. In terms of median single family consumers in the City relative to similar consumers outside the City, the increase in consumers' bills has been 6% more for the typical consumer inside the City. Yet, ComEd reports that there is no need for rate design changes.

TABLE 3 – RATEPAYER IMPACTS OF RECENT INCREASES

Usage in kWh per Month

	Average Chicago	25% Chicago	Median City	75% City	Average Outside	25% Outside	Median Outside	75% Outside
Single Family	682.01	225.50	450.50	750.50	862.29	375.50	600.50	900.50
Multi-Family	373.58	100.50	200.50	425.50	388.18	150.50	250.50	425.50
Single Family Space Heat	1,495.29	400.50	850.50	1,750.50	826.43	225.50	450.50	850.50
Multi Family Space Heat	1,759.01	650.50	1,038.00	2,125.50	850.29	300.50	563.00	988.00

Percent Increase in Electric Bill Relative to Rates Before 2010 Case

Single Family	**30.0%**	**53.3%**	**38.7%**	**28.1%**	**25.4%**	**42.6%**	**32.6%**	**24.6%**
Multi-Family	**25.3%**	**24.2%**	**24.7%**	**25.4%**	**25.4%**	**24.5%**	**24.9%**	**25.4%**
Single Family Space Heat	-8.0%	37.4%	9.7%	-12.2%	10.7%	57.7%	33.0%	9.7%
Multi Family Space Heat	-17.4%	-4.3%	-11.1%	-19.2%	-8.3%	7.9%	-2.1%	-10.5%

Q. Would it be appropriate to stop with the bill impacts from ComEd's 2010 case without analyzing the effect of ComEd's tariffs on average prices for delivery services associated with different usage levels?

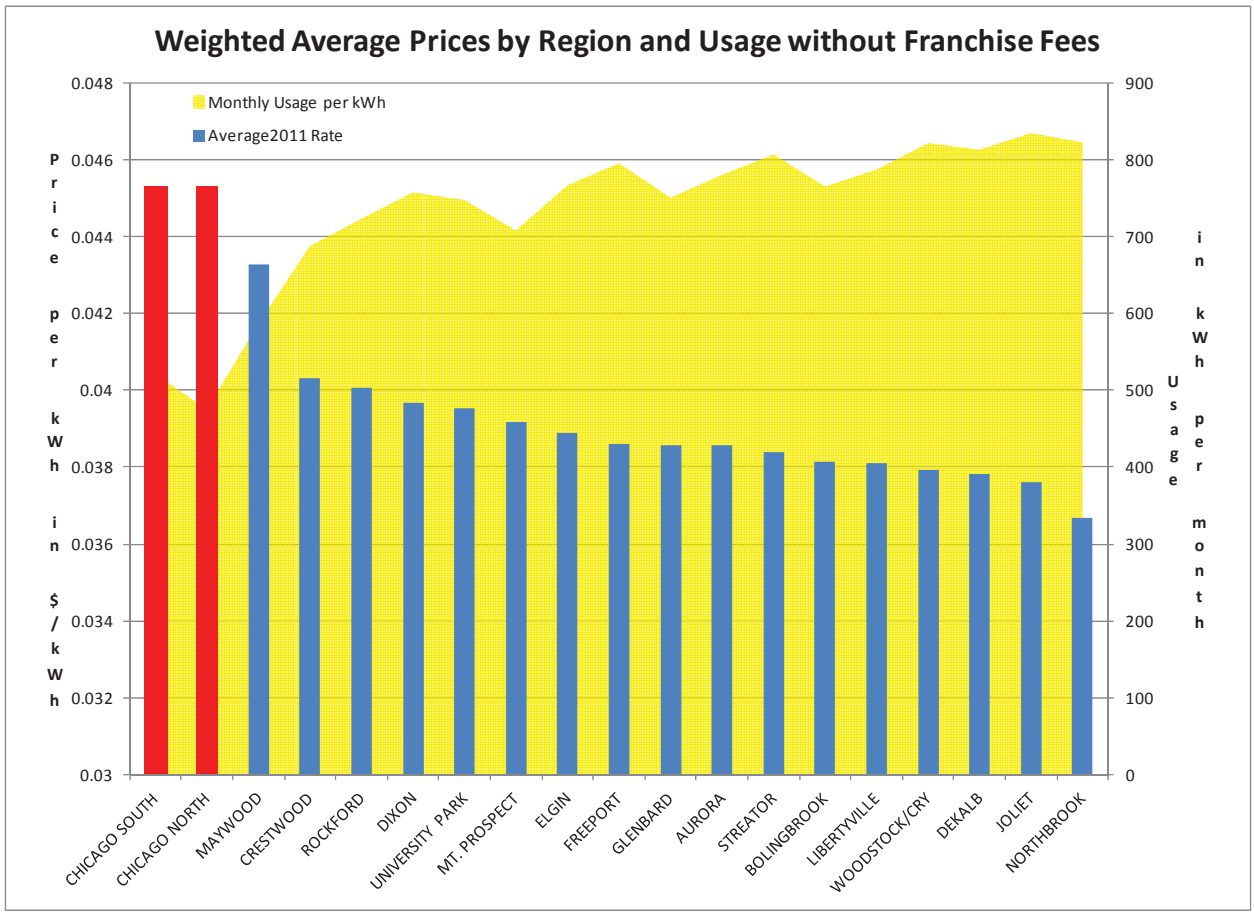
A. Absolutely not. Because of ComEd's tariff policies, the average price (total charges per kWh) of delivery service is higher inside the City of Chicago (representing low use consumers) than outside the City. Delivery service prices in the City are higher even though – due to the load factor, density, overhead wires, and age characteristics -- the costs of delivery service are lower in the City. Even returning to the level of rates before the 10-0467 Order and reducing the customer charge would not come close to addressing the serious inequities in ComEd's rate structure. Over a number of years, ComEd has been successful in developing a rate structure that results in higher prices to low use consumers, as illustrated by the position of City consumers who are more typically low-users, relative to lower prices to high-use consumers in the suburbs.

To illustrate the low-use to high-use differences, the table and the graph below show a comparison of City prices with outside City prices. The table shows that prices to residential consumers inside the City are 26% higher than outside City prices when franchise fees and concession services to suburban municipalities are included. The graph below the table demonstrates that both City regions (Chicago North and Chicago South) have higher residential prices than any other ComEd region (the graph does not include franchise fees). Without franchise fees, the average City prices are 17% higher than outside City prices.

531 **TABLE 4 – CITY & NON-CITY PRICE COMPARISON**

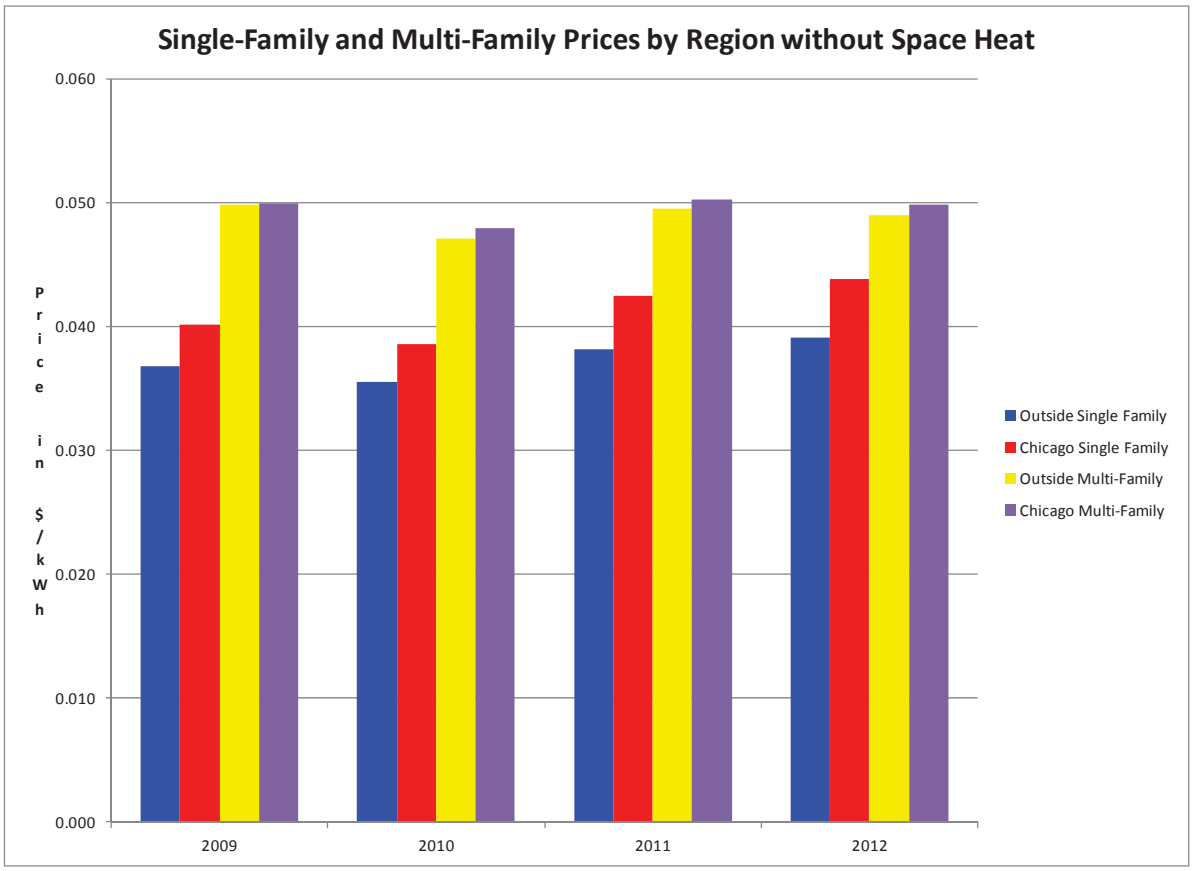
	Inside Chicago	Outside Chicago	Total
Revenues and kWh Sales			
Residental sales Including Supply	$ 445,022,889	$ 1,251,968,295	$ 1,696,991,184
Residental sales - Delivery Only	$ 364,428,082	$ 975,660,140	$ 1,340,088,222
Residental sales - Sum of kWh	6,516,583,892	22,011,628,700	28,528,212,592
Average Rate in $ per kWh			
Including Supply	0.0683	0.0569	0.0595
Delivery Only	0.0559	0.0443	0.0470
City/Outside Percent			
Including Supply	20.07%		
Delivery Only	26.17%		

532 **FIGURE 8 – REGIONAL USAGE & PRICE COMPARISONS**



The chart below shows the delivery service prices (without franchise fees) over time and separated between single-family and multi-family housing. This graph shows that despite lower customer charges, higher energy charges in the multi-family class result in higher prices for these consumers

FIGURE 9 – RESIDENTIAL PRICES OVER TIME



The unfairness of ComEd's delivery prices cannot be resolved simply by arguing against the very high account charge. The Commission must go further. Delivery service prices that are 18% higher in the City than outside of the City can be remedied only through more significant changes than simply lowering the account charge. The need for such change led to my proposal for a graduated customer charge. (An inverted energy

charge also could be effective). Despite rate and charge changes over time, all the resulting price structures are regressive and inequitable.

The graphs and table above showing the revenue per kWh for ratepayers residing inside the City boundaries and outside the City boundaries was one of the things that drove the City of Chicago to study municipalization in the 1980's. Because the price differences between the City and outside city regions are not consistent with the corresponding cost of service differences, the price difference is tantamount to a tax imposed on City ratepayers. But in this case, the proceeds are subsidies that flow, through reduced rates, to high use consumers (who generally have higher incomes) outside of the City.

RATE EFFECTS ON LOW INCOME CONSUMERS

Q. ComEd has previously suggested that there is not much relationship between income and usage, in part because many low use consumers are actually owners of vacation homes. Does the data provided in ComEd Exhibit 2.33 support this idea?

A. No. Though the correlation between income and electricity usage is not even questioned by most reasonable people, ComEd has denied this relationship repeatedly over the years. In denying the relationship ComEd has presented exceptions to the general rule as proof that the general rule is baseless. We can now demonstrate that ComEd's conclusion is not warranted, using data they provided in Exhibit 2.33.

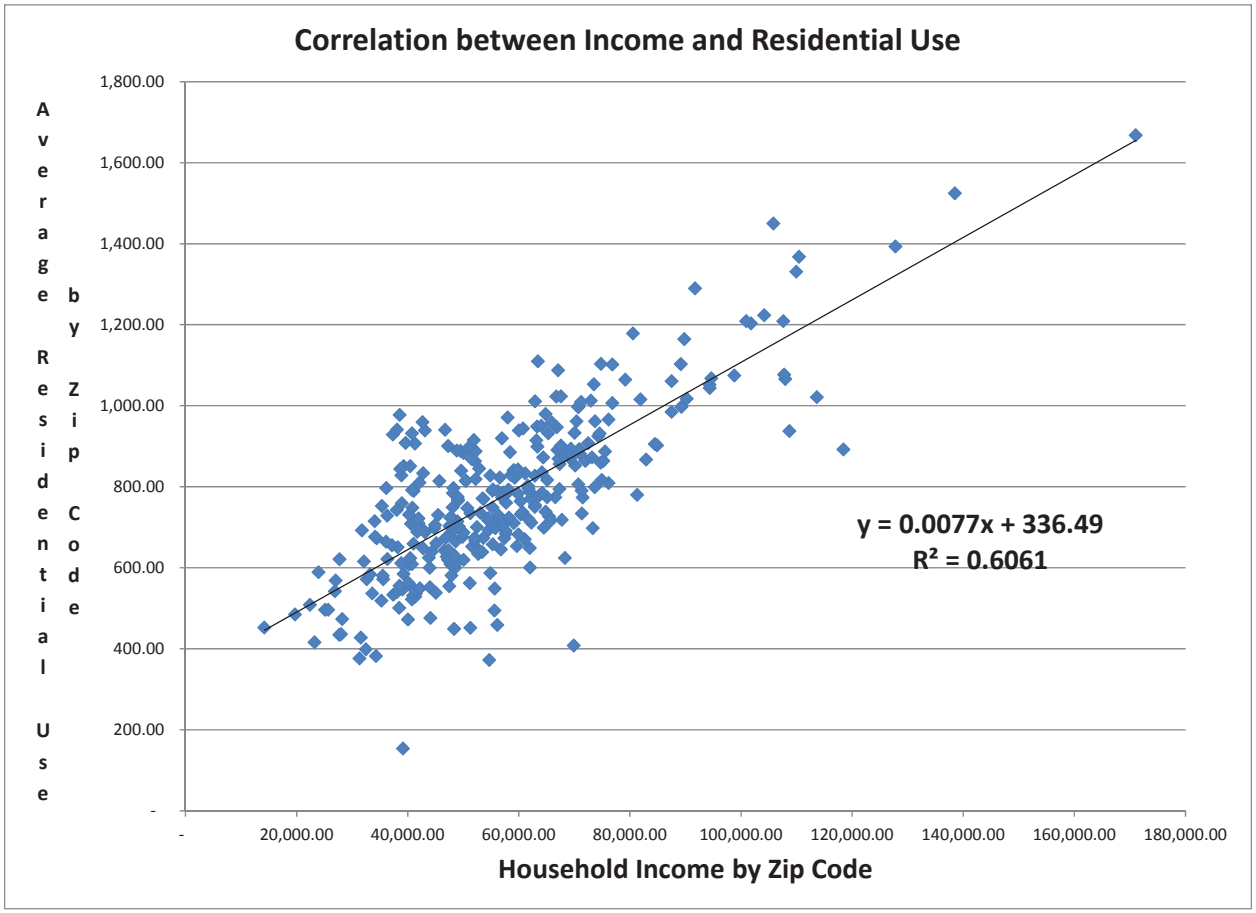
Previously, the City has not had residential usage data from the ComEd service territory arranged by income that would allow a formal statistical analysis to test ComEd's assertion. The work papers supporting ComEd Exhibit 2.33 included 100

565 percentiles of usage codes for each zip code in the ComEd service territory for the year
566 2010. Although it took a bit of work, I was able to convert the percentile codes to usage
567 and to associate usage with income for each different income level. This analysis
568 demonstrated an extremely strong relationship between income and usage, as shown in
569 the graph below. In statistical terms, the t-statistic for income has a value of 14.11,
570 implying that there is a 0.00000000000000000000000000000002511% chance that
571 income does not influence usage and the true relationship between income and usage is
572 zero. While details of the statistics are included in my work papers, the graph below
573 displays that income and usage relationship.[5] For me, this graph is a veritable piece of art
574 that demonstrates the extremely strong relationship between income and usage. If there
575 were no such relationship the dots would be clustered in a sphere and you could not
576 observe any kind of positive relationship.

577 The data provided by ComEd should put the issue of income and usage to bed
578 once and for all. I hope we will not hear again that the absence of a relationship between
579 income and usage is proved by all the vacation homes in the Chicago area.

[5] A few of the zip codes with very few accounts are eliminated from the graph.

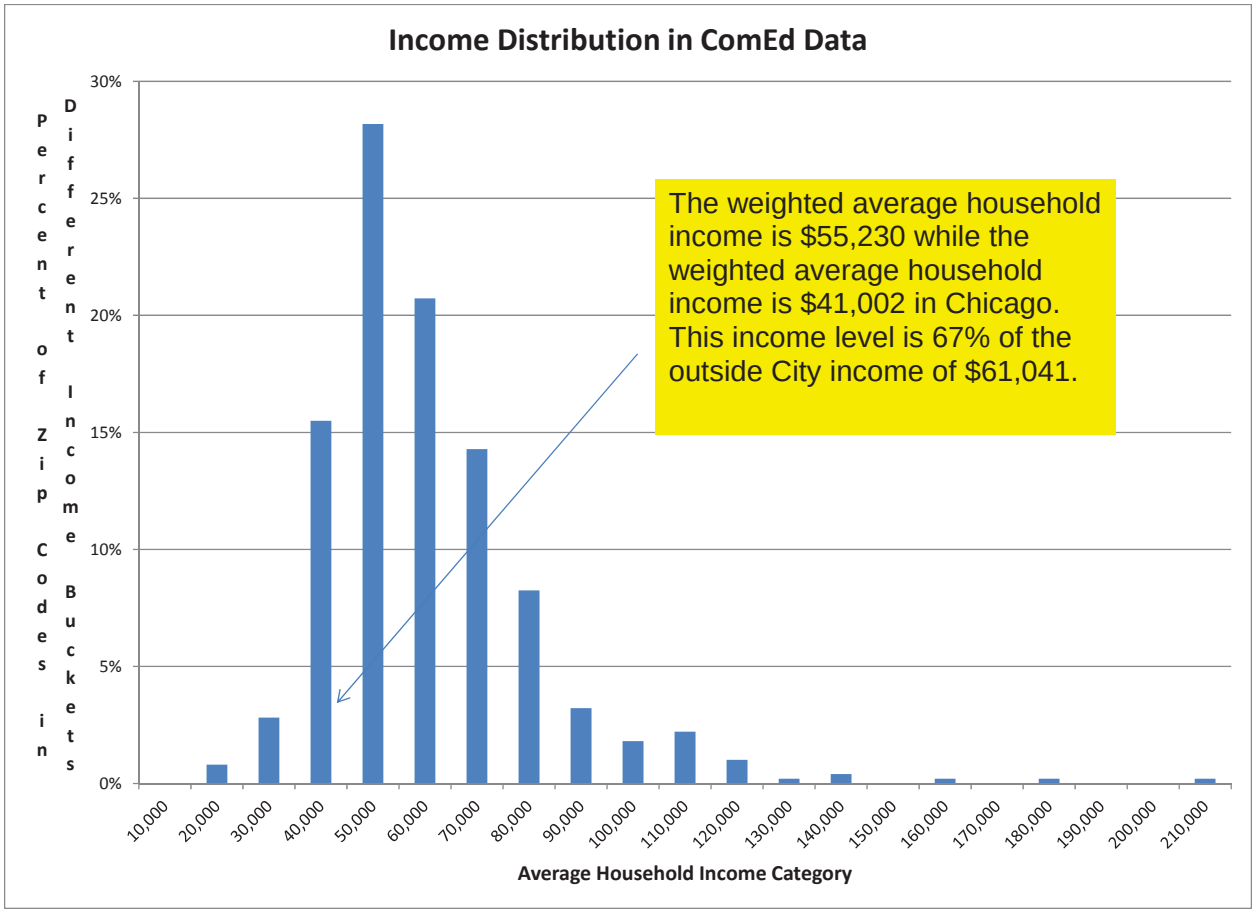
FIGURE 10 – INCOME AND USAGE CORRELATION



Q. Comment on the distribution of income, according to the data provided by ComEd?

A. The data show that in ComEd's service area, average annual household income varies from $11,833 in Seward to more than $200,000 in Kenilworth. The weighted average annual household income in the City of Chicago (weighted by the number of ComEd accounts) is only 67% of the outside City income. That wide range of income is shown in the graph below. The wide distribution of income is skewed toward lower incomes. That income distribution and the very strong relationship between income and usage imply that ComEd's account charge policy is highly regressive. That is, the greatest impacts fall on ratepayers at the low end of the income range.

590 **FIGURE 11 – INCOME DISTRIBUTION**



591 **Q. You mentioned the relationship between electricity usage and income in your**
592 **introduction. How do ComEd's tariff components affect consumers who earn**
593 **different levels of income?**

594 **A.** Now that the detailed data available in ComEd's Ex. 2.33 establishes the relationship
595 between income and usage -- and we no longer have to give credence to claims about
596 vacation homes in the south side of Chicago -- the Commission can understand the
597 effects of its policy decisions on people with low incomes. We can be very confident that
598 when rate policies are inequitable to low use consumers that they are also unfair to people

with low incomes. This does not mean that the Commission should set rates below the cost of service for low use consumers. But it does mean that the Commission should be very careful not to set rates above the cost of service for low use consumers. That is clearly the current situation, as discussed below. While regulatory policies may previously have been based on a lack of data or false assertions made without empirical proof, the facts are now established. Rates and charges that are unfair to low use ratepayers harm low income ratepayers.

COSTS OF SERVICE AND RATE DESIGN

COST OF SERVICE IMPLICATIONS FOR RATE DESIGN

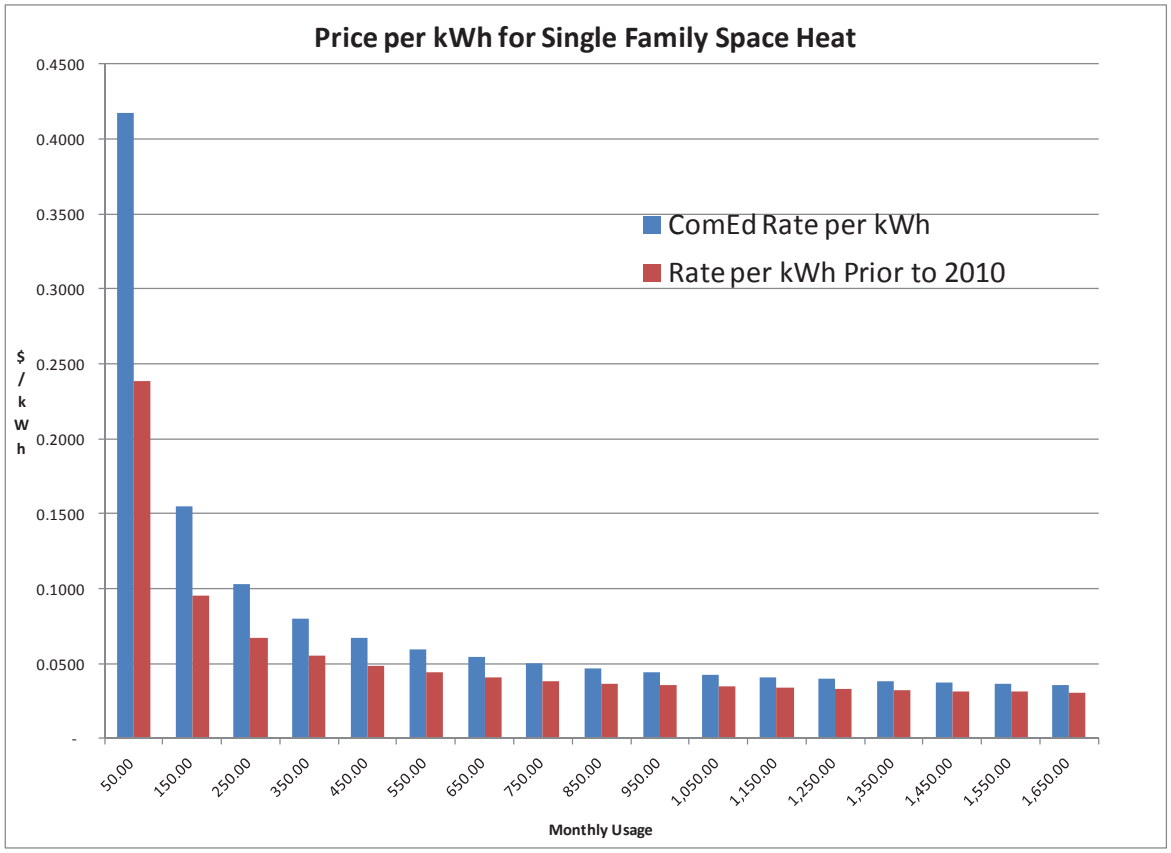
Q. The Commission directed ComEd to undertake an evaluation of "a new class cost of service and rate design" to accommodate the distinct characteristics of low use consumers. Can an appropriate rate design be created using a single account charge and a single energy charge, as ComEd does currently?

A. No. A single account charge and a single energy charge are very blunt instruments that cannot adequately reflect the lower costs of service for low-use consumers. The billing data available from ComEd's residential meters requires its rate designs to be derived from only ratepayer energy usage or ratepayer counts. Since the usage of a consumer is highly correlated with ComEd's cost of service drivers, developing a rate design with different prices for different levels of use can better associate cost with rates. Factors that lower cost include higher density, more above ground distribution, older equipment, and a more efficient load factor. These are all correlated with low use. This implies that price per kWh for distribution should increase as the usage level increases if the price

corresponds to cost of service. Further, the decline in cost is not offset by minor costs associated with measuring usage and sending out a bill for an account.

While prices should decline with usage, ComEd's rate structure results in the opposite. This is true whether the pre- 10-0467 Order structure is used or whether the current structure is used. It also occurs because the multi-family price is above the single family price. The chart below shows that if either ComEd's pre- 10-0467 Order tariff structure or its current tariff structure is used, per kWh prices are much higher for low-use consumers, and these prices go in the opposite direction of the cost of service (across usage levels).

FIGURE 12 – PRE-10-0467 ORDER AND CURRENT PRICES PER KWH



To correct the inequity in ComEd's rate structure – using only the available usage charge and customer charge mechanisms -- the Commission could establish an inverted energy charge that increases on a dollar per kWh basis as usage increases. Alternatively, the Commission can use a similar inverted structure using multiple customer charges, as I propose. In addition to revising the rate design, the allocation of costs for the multi-family and the single-family classes must be corrected by appropriately allocating costs that ComEd incorrectly labels customer related on the basis of revenues or usage, rather than the number of accounts.

DISTRIBUTION COST DRIVERS AND LOW USE CONSUMERS

Q. You have used City versus outside City comparisons in your discussion of cost of service. Why do you use the City region in evaluating costs associated with low usage?

A. My discussion of costs for the City of Chicago is not a proposal for separate regional rates. It is just that, given the available data, the City is an effective way to look at the cost characteristics of low use consumers, as it has been established that the City is distinctive in terms of usage level. Because ComEd did have separate City and outside City rates before 1978, the company still tracks a lot of data separated by the City boundaries. Sometimes, I may use the City and low use labels interchangeably.

Q. Do prices that are 17% higher in the City of Chicago that you discussed above reflect a cost of service that is higher inside the City and cost of service that is lower for high use consumers?

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.

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

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

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

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

Q. Can you elaborate on how population density affects cost?

A. Yes. Concentration of consumers and facilities translates directly into a smaller amount of distribution equipment required per ratepayer. For example, one can compute ratepayer responsibility for wire costs by dividing the amount of wires (in miles) by the number of ratepayers concentrated in the small affected area (both provided by ComEd). A lower number means that ratepayers in a densely populated area are responsible for less distribution costs per ratepayer. This analysis demonstrates a dramatically lower cost responsibility (by a factor of 3.73 times) for ratepayers in the City. This means that if the depreciated cost of wires – about 86% of total distribution cost – were the same inside and outside the City, then the cost of service outside the City would be 3.73 times as much as inside the City boundaries, due to the need for more facilities outside the City.

708 **FIGURE 13 – REGIONAL FACILITIES COSTS**

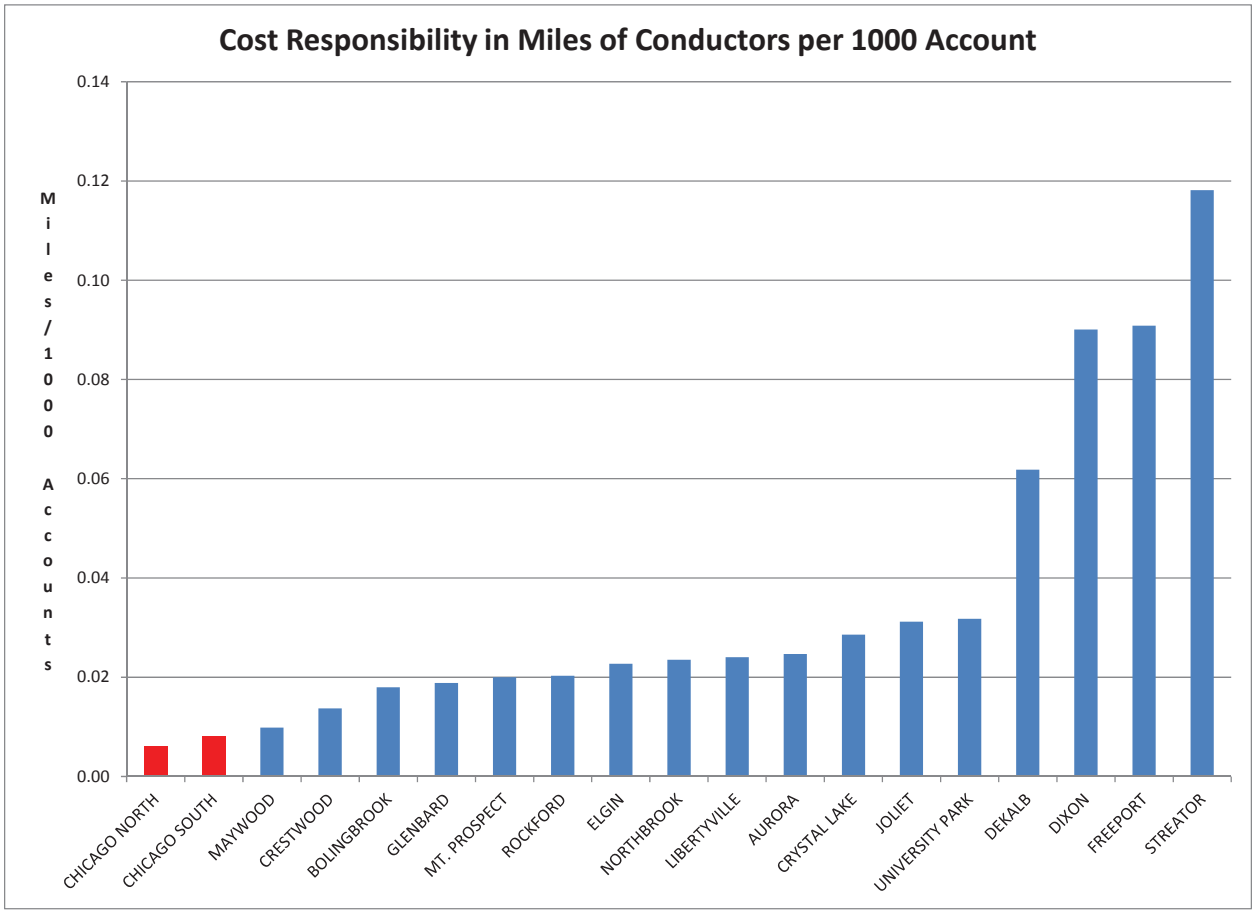


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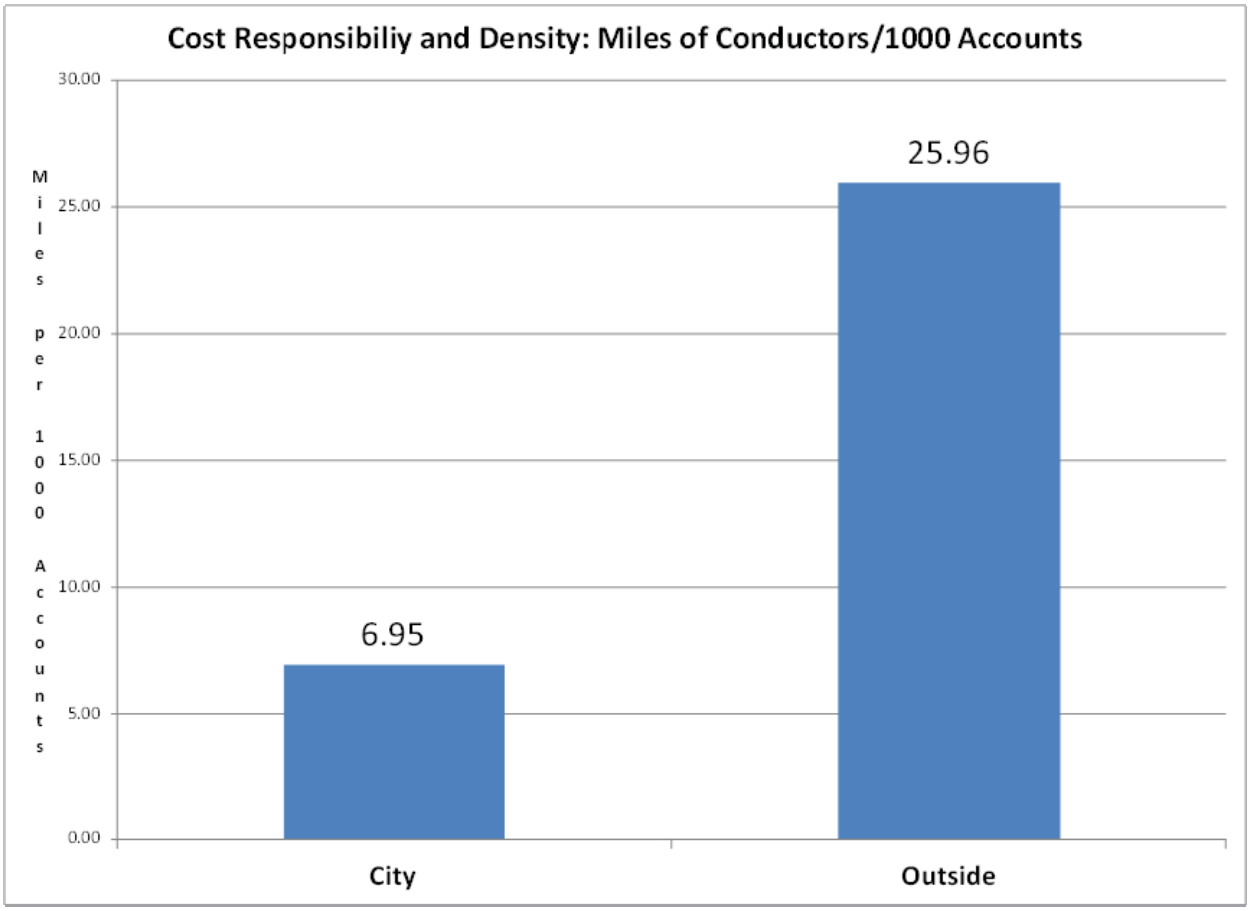
FIGURE 14 – DENSITY AND FACILITIES COSTS



Q. Is the notion of accounting for density in cost of service studies a radical idea?

A. No. One might think that accounting for density in a cost study is radical or some administrative nightmare. But long before ComEd spent many millions on its current computerized CEGIS and billing systems, the company directly accounted for density in its cost studies. ComEd would have its engineers fill out survey forms that quantified the number of overhead and underground miles used and provided the data for computing facility miles per consumer. Those forms were available and easily provided to the Commission and ratepayers to review in proceedings to evaluate its cost of service

studies. The substance of this paper process was far more sophisticated than the diagrams with flow charts that are used repeatedly in ComEd Exhibits 1.0, 2.0 and 3.0.

Q. Have you correlated the usage level to population density, rather than by region?

A. Yes. I have used the data in ComEd Exhibit 2.33 arranged by zip code and ComEd regional data to test the correlation between usage and density.[6] The analyses are presented in the two graphs below. The first graph presents the correlation between population density and usage by zip code and demonstrates that higher density is strongly correlated with low use. The second graph presents data by ComEd region on cost responsibility and usage. This graph shows a strong positive correlation between higher cost and higher usage. The correlation in turn means that usage can be used as a proxy for density and cost of service.

[6] Some of the zip codes with few accounts are not included in the chart.

731

732 **FIGURE 15 – DENSITY AND USAGE CORRELATION**

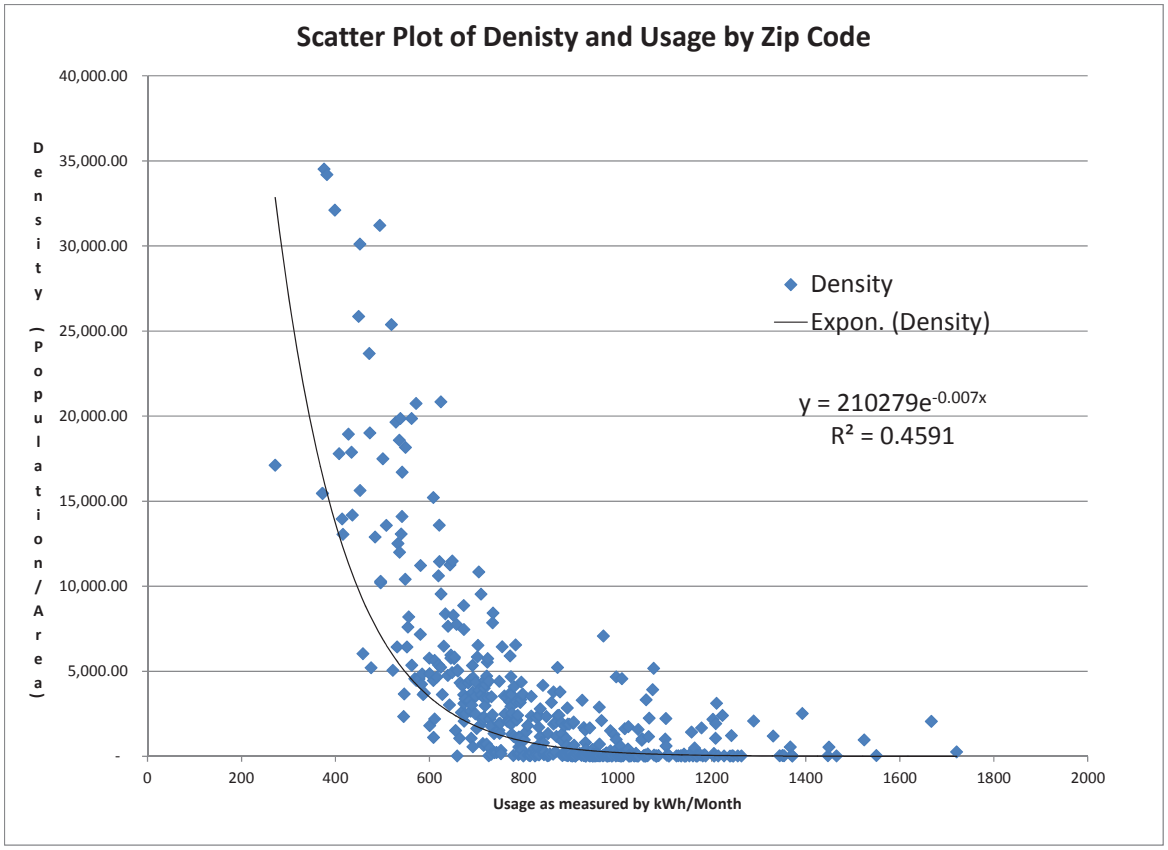
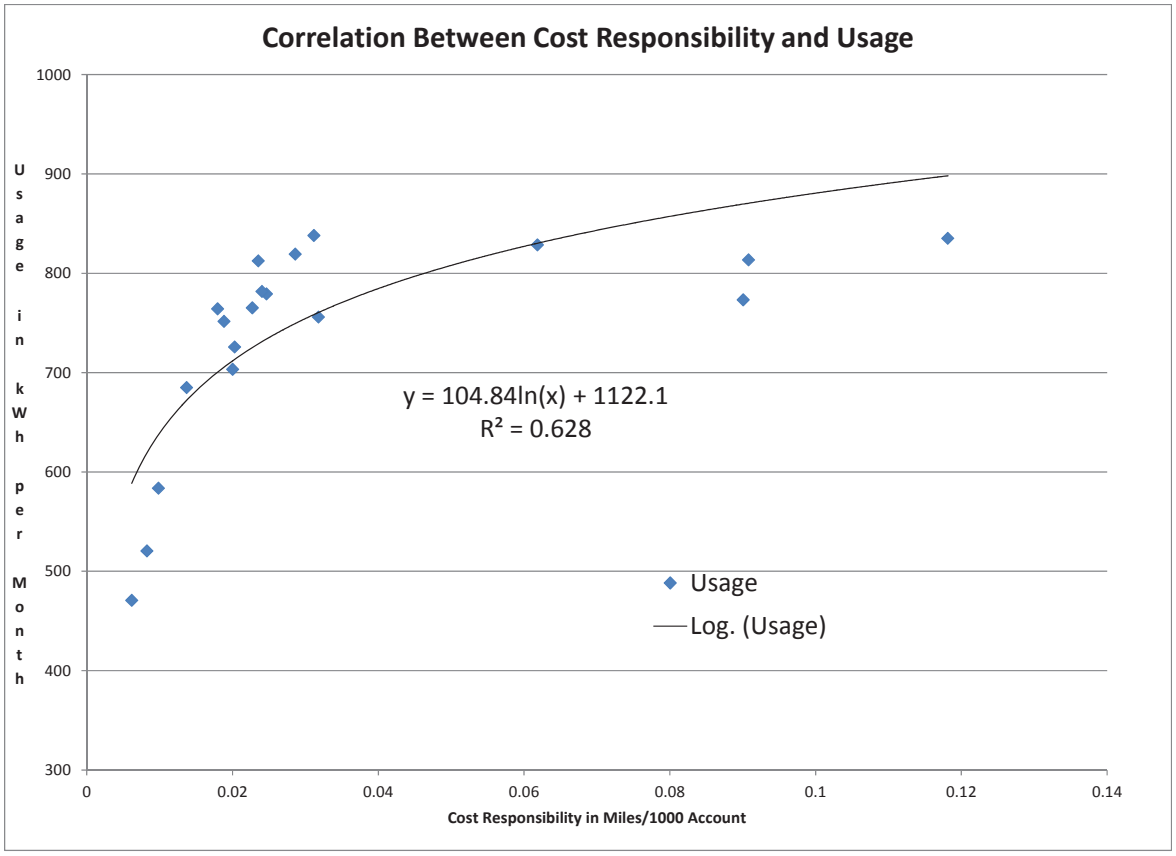


FIGURE 16 – COST AND USAGE CORRELATION



Correcting the inequity in ComEd's rates that is caused by neglecting to account for density, cannot be done by reducing the customer charge to the level that existed before the 10-0467 Order. To reflect the lower cost associated with higher density in ComEd's service area, inverted energy charges or tiered account charges need to be implemented. If the rate design is artificially constrained to one single customer class (with no usage or geographical distinctions), then a single account charge and a single energy charge cannot be configured to reflect the important differences in density that drive cost of service.

Q. How does undergrounding lower inside the City costs relative to outside the City costs?

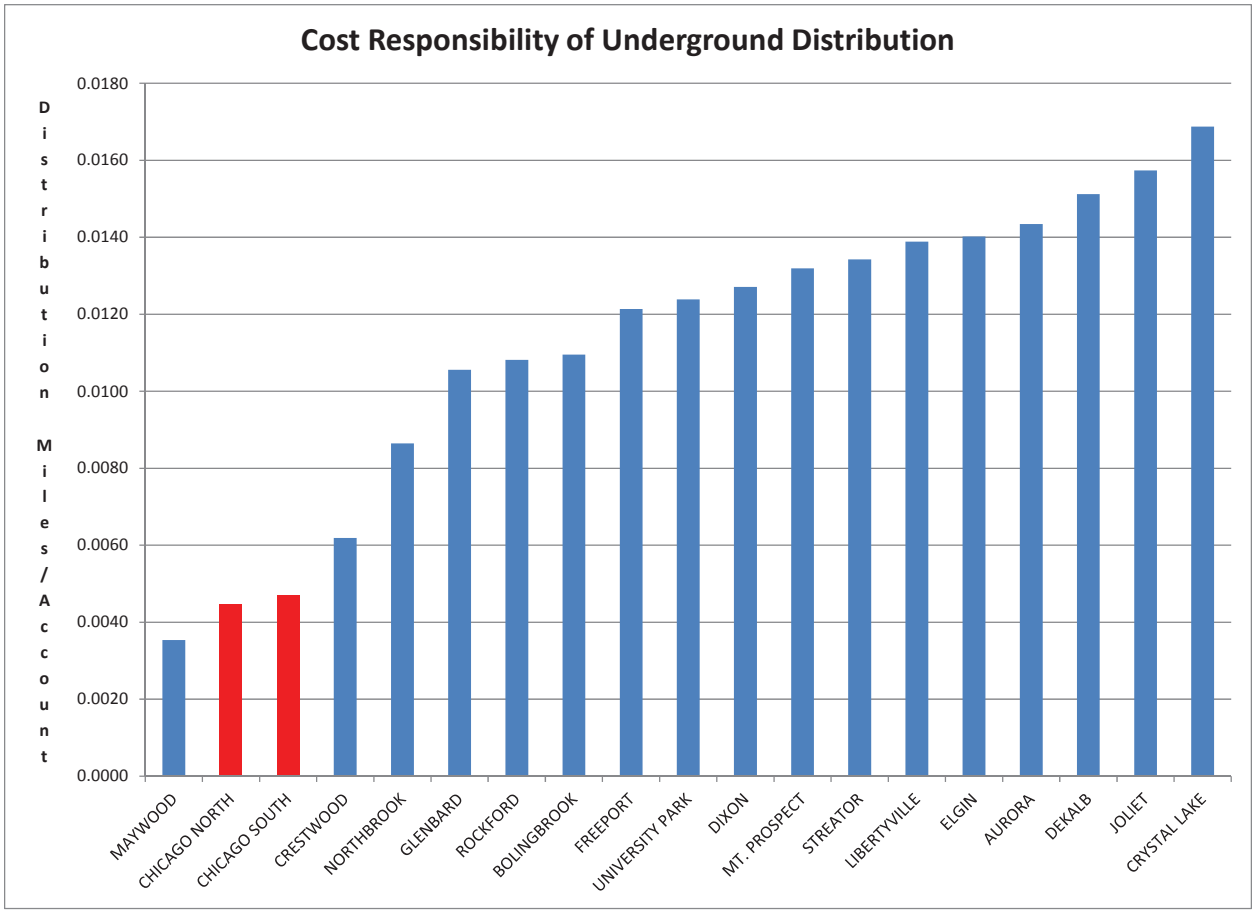
A. Consumer density, expressed in terms of conductor miles per ratepayer, does not tell the full story of cost differentials between the City and outside City regions of ComEd's service territory. The cost of underground equipment per mile is much more than the cost of overhead equipment. This was demonstrated by ComEd as long ago as its 2006 rate case, where ComEd provided information that the cost of underground equipment was 1.78 times the cost of new overhead equipment. The cost of underground lines relative to overhead lines can also be found in data ComEd compiles when making the secondary distribution cost calculations. These data show that the actual cost of underground relative to overhead is about five times the cost of overhead conductors, when the City underground related to the central business district is removed.

If residential consumers in the City of Chicago were served by more underground facilities and if low users typically were associated with more undergrounding, ComEd could try to support an argument that lower costs associated with higher density are offset by higher costs that come from more undergrounding. However, the data support the opposite conclusion. City residential consumers use less undergrounding and reside in higher density portions of ComEd's service area; both factors are associated with reduced costs of service.

One might expect that for the entire City of Chicago there is a lot of undergrounding, because there are no ComEd overhead wires in the central business district. However the data show that even with the unusual undergrounding in the central business district, the percentage of facilities installed underground across the entire City

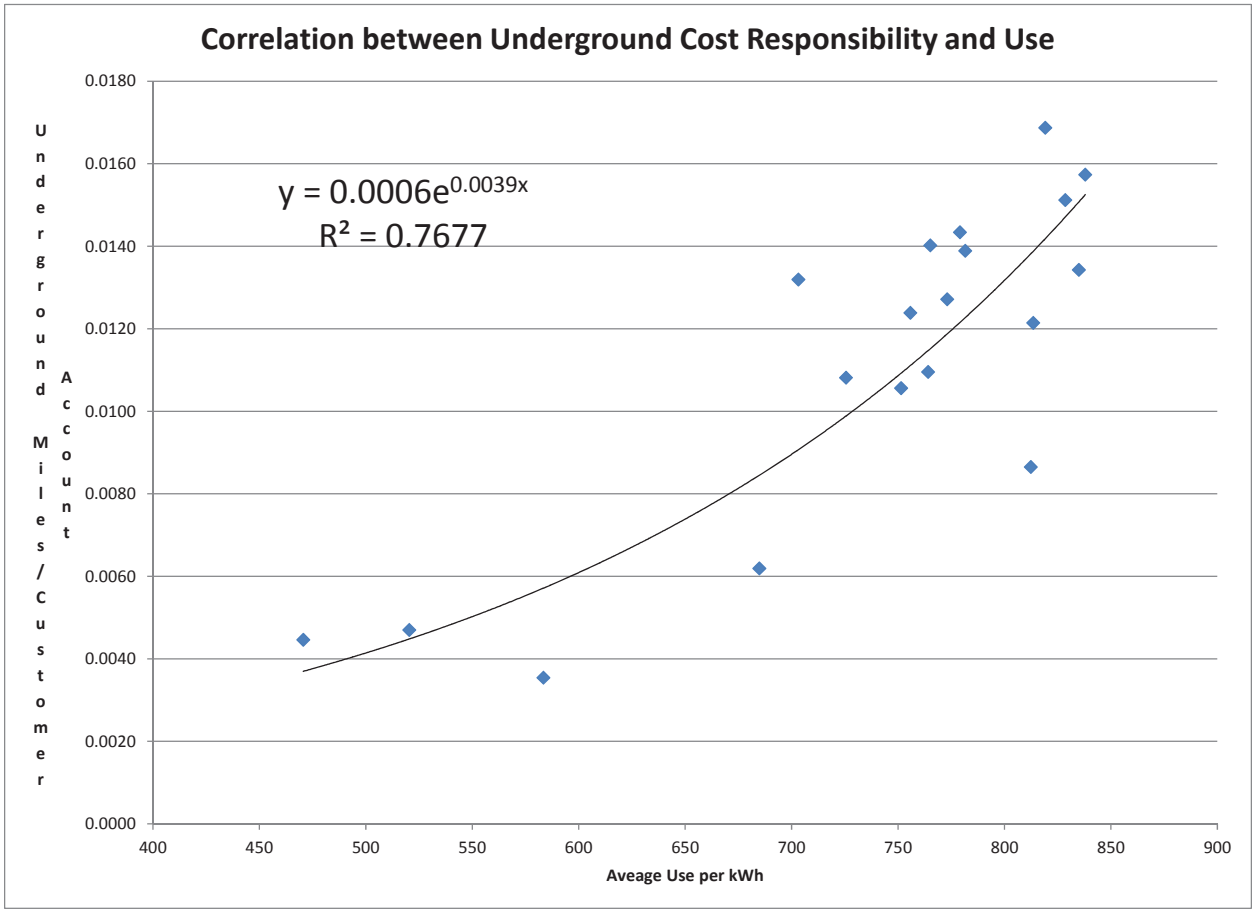
of Chicago is relatively low among ComEd's regions. This implies that there is a low percentage of undergrounding in residential areas. ComEd's data show that the Chicago North region (which includes the Loop) has less underground lines on a percentage basis than any other region, while the Chicago South region also has a relatively low amount of undergrounding. The graph below measures the cost responsibility of underground lines as measured by miles of conductors per account. The two Chicago regions along with Maywood have the lowest number of underground miles per ratepayer account.

FIGURE 17 – UNDERGROUND COSTS BY REGION



Because of distortions caused by non-residential ratepayers, data to perform the correlation between usage and underground responsibility is not as accurate as it could be. However, even using the ComEd data by region demonstrates a strong positive correlation between underground cost and usage as shown in the scatter plot below.

FIGURE 18 – UNDERGROUND COST AND USAGE CORRELATION



Q. How does the age of equipment affect delivery costs?

A. When measuring embedded cost of service, the age of equipment makes a big difference in the allocated cost to consumers for two reasons. First, the original invested cost of

equipment is less for older facilities due to inflation, real increases in the cost of copper, and other reasons. Second, the accumulated depreciation on older equipment is higher, making the net rate base cost to be recovered lower. For example, for a meter in older neighborhoods of the City of Chicago, it is likely that successive ratepayers at that location have paid its original cost many times over.

In the 2007 rate increase case, ComEd provided a lot of information about the cost of new equipment relative to exiting equipment to justify a rate increase driven by people choosing to move to distant suburbs. ComEd's data demonstrated that the cost of new distribution lines was $93,000 per mile while the cost of existing lines was $34,000 per mile. ComEd also presented data showing that while the overall inflation rate was 3%, the inflation in overhead distribution lines was 20%. This implies that older regions with low usage have lower cost.

In addition to lower original cost, equipment in older areas that are correlated with low usage has a higher level of accumulated depreciation. This implies that even if there were no increase in the original cost of equipment due to general inflation, the value of rate base would be lower in areas that typically are associated with lower usage. We have attempted to find the cost of ComEd equipment by region, including costs of operation and maintenance (such as tree-trimming) and to study the costs of equipment for older residential regions in the service territory. Despite ratepayers funding sophisticated, computerized CEGIS and accounting systems, ComEd has not been able to provide the necessary data.

TREATMENT OF COSTS THAT COMED CLASSIFIES AS CUSTOMER RELATED

Q. How does ComEd's cost study come up with higher costs for low use consumers?

A. ComEd's cost of service study does not differentiate costs according to any of the distribution characteristics discussed above. However the ComEd study does assume that a wide range of different costs are caused simply by a consumer having an account with the Company. The amount of costs that are classified as customer related by ComEd for non-space heating ratepayers sums to $458 million as shown in the table below.

TABLE 5-- COMED COSTS LABELED CUSTOMER RELATED

	Single Family w/o Space Heat	Multi Family w/o Space Heat
Customer Install. Other	38,771,575	18,090,494
Metering Services	90,596,947	42,329,655
Billing -- Computation & Data Mang.	138,230,974	65,206,893
Indirect Uncollectibles	21,972,727	6,102,191
Bill Issue & Processing	14,065,357	6,562,778
Customer Information	19,867,346	4,295,189
Revenue-Related (Customer)	(5,991,203)	(2,289,698)
Total Customer Costs per ComEd	317,513,722	140,297,501
Total Customer and Distribution Costs per ComEd	974,402,955	271,438,442
Customer Cost Percent	32.59%	51.69%

After revising ComEd's cost allocation to remove costs that are not caused by changes in accounts from items that the company labels customer related, the true billing costs are a small fraction of costs in the above table. Correcting the allocation of these costs causes the allocation for multi-family consumers to be reduced by about 20% or $55 million while costs to the single family class are increased by 4% or $42 million.[7]

[7] The remaining costs are allocated to space heating consumers.

Q. Are the ComEd costs shown in the above table reasonable?

A. No. Costs that are really caused by having an account with ComEd should include the costs of a standard meter and the cost of sending out a bill and nothing else as I explain below. There are no other costs that can be properly be identified as being caused by the existence of an account that can be created by splitting a single family house into a duplex or spitting up an apartment building into an increased number of units. Similarly, the only amounts that can be identified as cost savings when an account is abandoned is the salvage cost of the meter and the savings from not sending out a bill. Yet ComEd's position is that these basic function costs represent more than 50% of the entire cost of delivery for multi-family ratepayers, and more than 32% of the total cost for single family ratepayers.

I can imagine that if I prepared a bill for my clients, and more than 50% of the invoice amount was for the cost of measuring my services and preparing a bill, I would never get any new business and, if the billed clients had any sense, they would not pay me for the bill I sent to them. Historically, though, ComEd's jargon and tedious accounting data have somehow been enough to get this kind of crazy result buried in Commission orders -- without anyone stepping back and asking whether the result makes any sense.

The implication of these numbers is that either ComEd is incredibly inefficient in recording usage and sending out a bill, or ComEd dramatically overstates these costs. If billing and metering costs really represent 52% of ComEd's delivery services costs, one would think that some other method of measuring usage and sending a bill could be developed. Indeed, if 52% of ComEd's hundreds of millions of dollars in customer costs

actually are for measuring use and sending a bill, the Commission should immediately begin a prudence investigation. An open competitive bid to perform those functions would almost certainly identify another company that can do the bill preparation and usage measurement more efficiently.

Q. Can you provide an analogy explaining the type of costs that ComEd attempts to classify as customer related and why the results are so unreasonable?

A. Yes. Pretend you stop at a grocery store to pick up a few items. Assume that the store is the only one near your house and that you cannot use any other store. Imagine that when you step into the store an employee stops you and tells you that to enter you must pay $18 -- about 50% of the $36 you expected to spend on food, had there been no entry charge. You are told the $18 door charge is the same for all consumers, even if you only buy a can of beer, because the store must recover the cost of those automatic machines that allow the store to hire fewer check-out clerks, the cost of employees who deal with refunds and answer phone calls, and (of course) the cost of executives. When you ask why they must charge a fee just for buying a bottle of beer, their representative (whose salary is also part of the entry cost) tells you that these costs cannot be isolated and identified with particular types of food, so they must be recovered from an up-front charge.

Q. Is this silly example really analogous to what ComEd does?

A. Yes it is very similar. ComEd and other utilities have advanced the notion that if a cost cannot be identified as a usage cost then by default it should go into the customer cost

category. The ComEd cost allocation process attempts to put all costs that have been functionalized into a demand bucket or a customer account bucket (virtually ignoring usage as a cost-causer). (ComEd does not like to classify things like call center costs as administrative because those costs would then be allocated to non-residential ratepayers.) Further, any cost that cannot be classified as a demand cost is by default put into the number of accounts bucket. (ComEd's similar treatment of residential demand related costs is addressed separately.) The problem is that many costs cannot fit into one of the two buckets because they are not caused by either peak load or the existence of an account and they do not have an associated billing determinant. A third bucket must be used to collect costs ComEd allocates to residential consumers that cannot be placed into either the demand or the number of accounts bucket.

Q. Hasn't the Commission already addressed this issue?

A. Somewhat. While the Commission has made some progress in removing some cost from this process of assignment by the number of customers (or a similar proxy), ComEd continues to dramatically overstate the costs properly allocated on that basis. The Commission has removed uncollectible accounts expenses from customer based allocations, which establishes the very important precedent that there is a third bucket that can be used for costs that cannot easily be identified as account related or demand related. Those uncollectible expenses are now acknowledged as unrelated to the number of accounts or demand measures and allocated on a revenue basis. The Commission has also requested that ComEd allocate costs associated with demand side management on the basis of energy, rather than the number of customers. In case 08-0532, the

Commission ordered ComEd to study whether costs classified as customer costs should instead be related to energy usage. Despite all of these positive actions, customer costs calculated as 50% of all multi-family costs remain embedded in ComEd's cost study and rate design. Work by the Commission in a dramatic uphill battle against the thousands of accounts that ComEd puts into the billing and data management category has demonstrated to me that the only way to address the problem is through assessing the reasonableness of the results with careful logic.

Q. Does ComEd really spend 50% of its total costs on things that are caused when an account is added or deleted such as the cost of a meter and a stamp?

A. Of course not. The cause of this cost distortion is that ComEd includes, in the customer cost categories listed in the table above, many miscellaneous costs that are not at all caused by changes in the number of accounts. One way to think about what should be classified as an embedded customer cost is to think of a house (for single family) or a building (for multi-family) that is divided into separate accounts. In the single family case, a house is divided into two parts and becomes a duplex. For the multi-family analysis, a building is separated into ten studios instead of five two bedroom apartments. The same argument can be made the other way around if the number of accounts is reduced by consolidating a single family house that was formerly a duplex into one account. To test the example (and not be accused of applying short-run marginal cost) one can assume that every single family home in the ComEd system is split up and every apartment building is separated into studios. The question to ask is: "what added costs are caused by these new accounts?"

If everyone's house were as split into two, ComEd would have to buy a lot more meters and it would have to print out many more bills and pay for more bulk mail. But that is about all. Even the meter reading costs would hardly change. ComEd's meter readers would not have to do much more work as the meters are next to each other; the company would not have to pay their executives more money; ComEd would not have to pay more for advertising; it would not have more stolen electricity; it would not have to pay more people to respond to complaints; it would not have to pay more people to deal with outages; it would not have to change its CEGIS system; and, importantly it would not have to change its billing system that allows you to look up your usage and do other things and should not be limited by doubling the number of accounts.

Q. What are the costs of meters compared to the total costs allocated as customer costs?

A. The table below shows that the cost of meters per customer is less than one dollar per month which is only 1.4% of ComEd's total distribution costs.

TABLE 6 – CAPITAL METER COSTS

Capital Cost of Meters

	ECOSS Data
Meter Cost	400,445,390
Meter Accumulated Depreciation	(172,056,029)
Net Plant	228,389,361
Other Deductions	(58,608,115)
Rate Base	169,781,246
Rate of Return with Gross Up	9.57%
Return on Rate Base	16,239,654
Depreciation Expense	16,035,814
Total Capital Cost of Meters	32,275,468
Total Cost of Service	2,232,244,001
Capital Cost of Meters as Percent of Total Delivery	1.45%

Other costs that a change in account would cause are: (1) the cost of paper used to print bills; (2) the cost of envelopes for bills; and (3) the cost of postage to send bills. I have used an estimate of 50 cents for these items. No other costs are caused by virtue of a new customer account. Other costs should not be classified as account costs, because they are not directly caused by the simple existence of an account. Some of the costs that should not be included as account costs are the following.

- The cost of another service drop, which is not necessary for shared multi-family units and increases with the size of a house, in the case of single-family homes.
- The costs of meter reading, which vary depending on the density of homes in an area and would be much lower for the new units in existing structures, in the examples above.

- The administrative overhead costs of developing billing systems, employing clerks, establishing phone centers, and operations costs for other activities like handling customer complaints and managing customer information.

Q. How should costs that ComEd classifies as customer related but are not caused by the existence of an account be allocated?

A. In economic parlance, many of these items are analogous to public goods. In a first year economics class, students learn about public goods such as national defense and police that cannot be associated with individual consumers but are necessary and beneficial for the entire nation. For such goods, an individual would not be charged when a fire truck comes to their house, for example. These costs must be funded through some kind of tax revenues. Costs of making a fancy billing system, costs of having somebody in a call center to answer phone calls, costs of dealing with stolen electricity, general administrative costs and costs associated with responding to outages are all analogous to these public goods, just for a company. Just as nobody would suggest that cost of the police force should be charged disproportionately to poor people through some kind of poll tax, it is completely inappropriate to allocate the ComEd costs on the basis of the number of accounts. This is no different than the costs discussed above for the grocery store. Costs of their billing system, their check-out machines, and their call centers can only be collected by increasing the prices of items in the store. In the case of ComEd, allocation on the basis of energy usage or revenue is similar, after correcting the rate design.

Q. Are all of the costs that ComEd classifies as customer related (other than the embedded cost of a meter and the cost of sending out a bill) analogous to the public goods discussed above?

A. No. Some costs such as the costs of services and the costs of meter reading vary with the size of homes and are directly related to usage. When you carefully think about the allocation of the costs that ComEd classifies as customer related, you keep coming back to the point that, with the exception of the meter and printing the bill and sending the bill, all the rest of the costs must be allocated on the basis of revenues or energy usage.

Q. Given the higher per kWh prices you described when discussing ratepayer impacts and the lower costs of service in the City, have you the estimated City ratepayers' subsidy to other ratepayers?

A. Yes. The effect of higher prices in the City -- despite lower costs of service -- is a multi-million dollar transfer of wealth from ratepayers who live in small bungalows to ratepayers in large mansions in Wilmette and other suburban regions. To measure this subsidy, I computed the reduction in City bills that would occur if ComEd's rates were reduced to come closer to the true cost of service. I examined a series of remedial rate changes that remedy the current inequities to varying degrees. The table below shows different scenarios that I have presented to City representatives that demonstrate the magnitude of subsidies that are occurring every year. For example, the table shows that if the $/kWh delivery service prices were merely the same inside and outside of the City, the savings to City ratepayers would be $40 million per year. If rates were reduced by 10% in the City to reflect lower costs of service due to higher density, older equipment, a

better load factor, or overhead wires, this would increase the annual subsidy by almost $70 million per year.

TABLE 7 – CITY RATEPAYER SUBSIDIES TO OTHERS

City Subsidy to Outsided City Under Different Assmptions in Dollars	
Adjsted for prior to 2010 rates	4,551,856
Equal per kWh Price	40,299,819
City prices 90% of Outside City Price	69,924,340

RATE DESIGN POLICY ISSUES

Q. What policy issues arise when analyzing ComEd's rate design?

A. Many policy issues, even where not directly related to cost of service, are important for the Commission in considering ComEd's rate design. These policy questions include:

1. Should costs that are unrelated to the number of ratepayers (like call center costs or administrative costs) be placed in the account charge simply because they cannot be directly related to the number of kWh delivered?

2. Should the current account charge structure be maintained to provide a mechanism to protect ComEd's revenue stability?

3. Do account charge design practices in the natural gas industry (which also are problematic) validate the same approach for electricity utility service?

4. Should account charges be reduced or otherwise modified to encourage conservation and more efficient usage?

5. Should the Commission account for whether ComEd's rate structure is regressive, that is, has an unnecessarily harsh impact on low income ratepayers, when developing prices?

My discussion of these policy questions demonstrates that a graduated customer charge, developed with weather normalized usage, can address all of these policy issues. At the same time, the structure I propose will produce rates that are equitable and that reflect ComEd's costs of service, at a more granular level that satisfies the Commission's concern about rate design impacts on low use ratepayers.

In this section I also comment on ComEd Exhibit 2.33 which the company names ""Residential Electricity Usage and Bill Impacts of the Straight Fixed Variable Rate Design" or the "Residential Usage Study."

RATE DESIGN FOR "FIXED" COSTS

Q. What is the policy concern with placing the overhead costs and distribution capacity (demand) costs you discussed earlier in the account charge?

A. Illinois' consistent policy of cost-based costs is severely compromised by ComEd's customer charges and rate design. A utility's embedded cost of service study ("ECOSS") is supposed to provide the cost data needed to develop cost based rates. However, an improperly performed ECOSS has the opposite effect, *i.e.*, rates for some ratepayers that do not reflect the costs incurred to serve them.

Q. What is the connection between ComEd's ECOSS and the rate design issues relating to demand costs and overhead costs?

A. As to these specific costs, ComEd's ECOSS properly classifies its demand costs as costs related to consumers' peak demand. The problem with ComEd's treatment of those costs is a rate design policy matter – specifically, ComEd's arbitrary labeling of costs as "fixed" and assigning them by default for customer charge recovery. That allocation is directly contrary to the ECOSS' recognition that demand is a driver of ComEd's costs.[8] ComEd has layered over its ECOSS a separate framework of a "fixed" costs category (not recognized in its ECOSS). The outcome of that process is the crazy results I discussed in the Impacts section of my testimony.

Q. What is the relationship between distribution capacity (demand) costs, on the one hand, and ComEd's usage and account charges, on the other?

A. In contrast to generation, it is extremely unlikely that the distribution system will have to change to deliver more electricity for each additional lamp or television turned on. When you switch on your lights you are not imposing costs on the electricity distribution system in the same way that you impose costs on the generation system. From the perspective of generation, whenever you put the lights on, you use additional electricity that some generation plant must operate more to produce – at an additional cost. When the lights go off, generation production and generation costs go back down. You cannot say the same about distribution.

It is also the case that the distribution system will not have to change to accommodate a change in residential occupant or a split of a residence into another

[8] The absence of residential demand meters is not a basis for treating demand costs like customer costs. Moreover, the installation of AMI meters will remove that excuse.

account.[9] In neither case is there a duplication of the automatic, direct relationship one sees in the variance of generation output with usage changes.

Q. Are you saying that more usage or more consumers can never require to an increase in generation or distribution system capacity?

A. No. At some point, changes in the amount of electricity used may require a change in the amount of electricity that can be generated at one time or on short notice, *i.e.*, a change in generation capacity. Similarly, changes in usage may require a change in necessary distribution capacity (the ability to meet the demand for delivery of electricity). Since actual demand comes only from consumer usage, changes in consumer count are irrelevant.

REVENUE STABILITY

Q. The graduated customer charge approach you propose seems simple enough. Why has it not been used before?

A. A real discussion over demand costs (among others) and the account charge has been side-tracked by the novel conception of "fixed" costs that Illinois utilities have recently used in Commission proceedings. In their arguments, "fixed" costs are defined negatively -- as any cost that is not tied directly to usage. Once costs not related to usage are simplistically labeled "fixed," they are inappropriately treated -- by default -- as customer related, that is, recovered through the fixed customer charge. The label "fixed" is used to avoid having to show a real relationship to the ratepayer count underlying customer charges.

[9] As a practical matter, utilities do not change their distribution systems to reflect decreased deliveries.

The progress ComEd has made on the distribution capacity cost issue is to acknowledge, without any doubt, that distribution costs are caused by increases in peak load. (See ComEd Exhibit 2.33.) This conclusion recognizes that when you switch on your electricity on a very hot day in August that you may be increasing the likelihood of an outage because it challenges the system's capacity to deliver the electricity being demanded. The increased usage in such conditions will increase distribution line losses, cause distribution lines to sag, and lower delivered voltage, possibly prompting a power outage. The famous disastrous outages that have occurred on the ComEd system – the Crawford fire outage of 1989, the Wrigleyville outage and the loop outage -- all happened when the weather was hot and there was increased demand on the system to deliver electricity to combat effects of the heat. While it may not be as obvious as with generation costs, increased usage during a peak period does create pressure on the distribution system and result in increased costs. ComEd's recognition of the effect of peak load on its capacity needs (and demand costs) is an important starting point for a real examination of how those costs should be recovered.

ComEd's meter measurements do not allow the Commission to set residential consumer rates or charges on the basis of usage at the time of the regional peak – the true cost cause of ComEd's distribution demand costs. However, the Commission can set customer charges at different levels, with the levels defined as a function of ratepayer usage during the system peak month of the prior year. While my proposal is derived from the moving average of usage over the past twelve months, I have no objection to basing the graduated charges on weather normalized usage in the system's highest month of usage, rather than the twelve month moving average.

Q. Should the possible effects of weather on revenues affect the rate design choice between usage and customer charges?

A. Clearly, weather can cause ratepayers to require more or less electricity, with a direct effect on revenues from usage charges. Anybody who has lived in Chicago knows that the weather can be variable – from winter wind chills below minus 40 to hot and humid periods in the summer.

It is understandable that ComEd executives would like to reduce their revenue exposure to weather variation through a high account charge. However, the weather variation risk is really not much of a risk, because utility companies already have such low risk from other regulatory or legislative policies. It is my understanding that under ComEd's formula rates, its revenues are virtually guaranteed, with remaining risks limited by an earnings collar. In this environment, weather risk is one of the last remaining things ComEd can try to avoid. Without weather risk, ComEd would become virtually risk free, while retaining a fixed legislated return based on higher risk.

I do not believe the weather risk is a very big issue, because of the mean reversion in weather, and because of gradual warming of the planet. But if the Commission decides to reduce ComEd's remaining risk even further, the graduated account charge is a flexible enough mechanism that it could be structured to eliminate this risk. If the graduated charges were derived from weather normalized usage, rather than actual usage, then ComEd revenues would not fluctuate with changes in the weather. From a ratepayer perspective, if you buy a compact florescent light, then your weather normalized load would go down. But if you reduce your use of your air conditioner because the summer

is cooler than normal, then you would not get a break on your bill. Weather normalizing the usage criteria for graduation from one account charge step to the next, the utility revenue stability objective is met, while energy efficiency policy objectives are protected, since savings from efficiency that are not related to weather variation are preserved.

ENERGY EFFICIENCY

Q. What is the policy issue stemming from the effect of account charges on the promotion of energy efficiency?

A. The manner in which account charges discourage energy efficiency investments was the subject of numerous pieces of testimony in ComEd's last rate design case. Through establishing the highest account charge in the nation and lowering its energy charge, ComEd is promoting higher electricity usage. Further, since the 10-0467 Order, the adverse effects of ComEd's high account charge have become even more problematic, as the electricity commodity price has declined. Delivery services charges (in particular, the monthly account charge) have become a larger portion of ratepayers' bills, and there is less potential for savings from conservation, with a larger fraction of the bill a flat charge. A graduated account charge preserves the incentive for energy efficiency, removes the inequity of the single account charge, and meets ComEd's revenue stability objectives.

When implementing the graduated account charge, the Commission should order that ComEd use plain language (in bold lettering) advising consumers that reducing usage will reduce their bills. If a consumer insulates her house, buys a more efficient refrigerator, or purchases compact florescent bulbs, there would be clear effects of these conservation measures on her electric bill.

GAS-ELECTRIC INDUSTRY DIFFERENCES

Q. What are the policy implications of differences between account charges in the electricity distribution and the natural gas distribution industries?

A. I understand that ComEd's increasing account charges have followed a trend in the natural gas distribution industry, where more and more distribution costs have been included in the account charge. While I am in no way supporting the high account charges in the natural gas industry, some big differences between the natural gas industry and the electric industry must be emphasized, as the Commission considers proposals for ComEd's customer charge:

1. The diversity in the housing stock in northern Illinois has much less of an effect on rate equity for gas distribution consumers than for ComEd's electricity consumers. The dramatic differences in cost that underlie the inequity in electricity rates are driven by variations in usage that are less important for gas utility consumers, as there are three different companies that serve the ComEd territory. The result is that the separate gas utility territories isolate the distinctive costs for different geographic regions, with their different housing stock. If ComEd revenues and rates were based on regional costs defined by the same regions that are represented by People's Gas, and North Shore gas, and Northern Illinois Gas, the revenue per kWh and the total price ComEd consumers pay would better reflect the actual costs of delivery service across ComEd's service area and populations. The $/kWh price would be lower for the City of Chicago than for other regions.

2. Revenue stability and weather normalization has been a bigger issue in the natural gas industry, where sales volumes have generally declined over recent

years due to milder winters. However, summers have generally been warming, alleviating any such problem for ComEd.[10]

3. The effect of high account charges on low income consumers is more pronounced in the electricity industry than in the natural gas industry. Natural gas is primarily used for cooking and heating, and the amount of heat required per person does not vary that much with income. Electricity use on the other hand is highly correlated with income as I demonstrated above (to refute ComEd's arguments about vacation homes.) A former colleague, David Poyer, who studied the issue of income elasticity in the energy industry referred to electricity as the "rich man's fuel." All of this means that the inequity in rates for low-users in electricity is highly regressive, while it may be less regressive in the natural gas industry.

4. Billing differences between electricity and gas sometimes alleviate the effect of high account charges for natural gas utility consumers. Natural gas costs are sometimes included in the rent for multi-family units, meaning the account charge is paid only once, instead of by the ratepayer in each apartment. This occurs less in the electricity industry.

COMED'S RESIDENTIAL USAGE AND BILL IMPACT STUDY (COMED EX. 2.33)

COMED'S RESIDENTIAL USAGE AND BILL IMPACT STUDY (COMED EX. 2.33)

[10] As with ComEd, I understand that legislated rates have largely removed revenue stability as a reason for high customer charges. To the extent any such concerns remain, the notion of weather normalized graduated account charges also could be applied in the natural gas industry.

Q. Is there any legitimate cost basis for including distribution capacity costs in the account charge element of ComEd's residential tariffs?

A. Not in any way. Including costs related to distribution lines, distribution poles, transformers, and other equipment in the account charge is a radical idea that has no basis in economic theory, regulatory principles, or fairness. ComEd's general approach is tantamount to using short-run marginal costs for distribution costs and then imposing the difference between marginal costs and average cost disproportionally on the lowest use ratepayers.

Q. What is your opinion about the quality of analysis in Exhibit 2.33?

A. The principal conclusions of the analysis are that demand drives distribution equipment costs and that energy is not correlated to demand. In fact, the study proves only that low usage is strongly correlated with low income – something not mentioned anywhere in the text of ComEd's testimony.

Q. From a cost of service perspective, what is the major problem with ComEd's proposal to use the number of consumers rather than energy delivered as the basis for distribution rate design?

A. Unlike in ComEd's last rate design case, here ComEd does acknowledge that distribution costs are driven by demand, and not the number of consumers (ComEd Exhibit 2.33, p 17).[11] Now, however, ComEd attempts to make the truly remarkable argument that there

[11] ComEd does not highlight this important conclusion that demand is its main cost driver (a conclusion compelled by its Exhibit 2.33 raw data). Instead, ComEd asserts emphatically that usage is not a cause of its facilities needs (and costs). ComEd ignores the equally important implication of the exhibit's data that customer count also does not drive those costs.

is no relationship between usage and demand. Because the demand of a consumer at the system peak hour does not define the consumer's overall usage, ComEd's logic concludes that demand must be related only to the number of consumers and its demand costs should be recovered through the account charge. That ComEd would even make such an argument in a study (ComEd Exhibit 2.33) removes credibility from its analyses.

Q. Is ComEd's implicit argument -- that a when a single home is split into a duplex that distribution costs double – a reasonable one?

A. Of course not. The amount that ComEd spends on construction of distribution equipment depends on the size of regional load (as well as density, overhead lines versus underground lines, and other factors). Indeed, ComEd still proposes to allocate costs between the residential and non-residential classes on the basis of load. This interclass allocation is completely inconsistent with ComEd's customer count based allocation of costs within the residential class. Consider ComEd's treatment of the cost of one distribution pole. ComEd would split the cost of the pole between residential and non-residential ratepayers using the relative demand of the ratepayer classes. But ComEd allocates costs of that same pole within the residential class using the number of ratepayers -- and ignoring consumer size (demand).

Q. What content in ComEd's Exhibit 2.33 supports its overall conclusion that there is no "pervasive inequity that might warrant a restructuring of charges for delivery service within the existing residential delivery classes"?

A. The raw data certainly do not. Only ComEd's analysis purports to reach conclusions that support the proposed rate design. ComEd's study first presents a glossary of terms, some defined in a way that advances favored outcomes. For example, ComEd defines bills so that its bill comparisons include commodity charges in addition to the delivery charges at issue in this proceeding. Next, the study describes peak demand in an inaccurate way, using analogies of a pool and a road. ComEd's analogies also do not distinguish between regional coincident demand (which drives distribution facilities needs), class demand (which is accumulated from across regions), and non-coincident demand (which can be unrelated to the peak demand that drives distribution costs). Then, in a section called "Residential Electricity Usage: Observations and Evidence", ComEd attempts to prove that energy (usage) is somehow not correlated with demand, even though without usage there is no demand at all.

In its argument to disconnect usage from demand, the company claims that vacation homes skew the usage and demand data in the City of Chicago, leaving the impression that Chicago is a vacation paradise like Nice, France, or Door County in Wisconsin. However, ComEd has admitted that it does not measure the incidence of vacation homes in Chicago or otherwise. ComEd also emphasizes that both high users and low users may reside in a particular small area, as though that affects any of its cost or rate analyses. However, ComEd does not determine either its costs of service or the delivery service rates that it presents to the Commission on such a regional basis. The proximity of high use and low use customers is meaningless in ComEd's system-wide ratemaking analyses.

Finally, the study claimed that the impact of ComEd's high customer charges was not much for low use consumers. I have discussed the actual impacts of ComEd's customer charges on residential consumers in an earlier section of this testimony. The conclusion of my analysis is quite different.

Q. Were those the only conclusions offered in the report?

A. No. Following the broad conclusion discussed above (which is repeated below, in context), additional conclusions were stated in the Conclusions section at the end of the report.

> CONCLUSION
> The observations and evidence studied in this analysis reveal that there is no cost basis for creating additional residential delivery classes within the Company's rate structure, nor is there a pervasive inequity that might warrant a restructuring of charges for delivery service within the existing residential delivery classes. In particular the following observations and evidence support this conclusion:
>
> - The Company must plan its distribution system and incur costs to put facilities in place in that system on the basis of consumers' maximum demands for electricity (kW) and not simply on electricity usage (kWh).
>
> - Electricity usage at any given residential premises may change from low levels to high levels for a number of reasons.
>
> - Consumers with low levels of electricity usage are located in the same zip codes, even within the same block or building, as consumers with high levels of electricity usage.
>
> - Most ratepayers did not see a dramatic increase in their bills for electric service due to the institution of the SFV rate design.
>
> - Many accounts with low electricity usage have designations that indicate the electricity usage, or lack thereof, is for an overall building purpose, such as an alarm or fire pump that is rarely, if ever used, and are not for premises that are used for general day-to-day residential living purposes.

Q. Please comment on these other study conclusions listed. Can you begin with ComEd's conclusion that it "must plan its distribution system and incur costs to put facilities in place in that system on the basis of consumers' maximum demands for electricity (kW) and not simply on electricity usage (kWh)"?

A. If ComEd really wanted to test whether there is no relation between demand and usage -- a critical premise for its "fixed" cost label, all ComEd had to do is to analyze residential load research data that tracks both demand and energy for various consumers. ComEd collects such data from a sample of its residential ratepayers and had the necessary data available for its study. The Company could have regressed demand against energy in a routine regression analysis, which most spreadsheet software will do for you, using the load research sample. By evaluating whether the resulting coefficient is statistically different from zero, ComEd could have tested its premise against the reality of its own ratepayers' usage and demand. ComEd did not perform this analysis.

Q. Did you perform such a regression analysis, to test the link between usage and demand?

A. No, I was unable to do so by the deadline date of this testimony. The City of Chicago requested ComEd's residential load research data so that I could perform that and other analyses. I had not received the data when I had to conclude my analyses and prepare testimony. I intend to provide (in supplemental or rebuttal testimony) analyses responding to the Commission directives that require those data.

Q. Comment on the second and third bullet points in ComEd's conclusion that "Electricity usage at any given residential premises may change from low levels to high levels for a number of reasons" and "Customers with low levels of electricity usage are located in the same zip codes, even within the same block or building, as customers with high levels of electricity usage"?

A. By making these statements, ComEd suggests that the size of a home has nothing to do the amount of electricity use. If this is true, then ComEd's ratepayers use the same amount of air conditioning in a small house as a large house; the number of light bulbs people have is independent of the number of rooms in a home; the number of computers, TV's and other appliances has nothing to do with the how many people live in a home. There is no doubt that usage can go up and down, large and small houses can co-exist in an area, and people may change their energy usage. But to assert that these simple facts prove that residential demand is entirely random or has nothing to do with the size of a home is incorrect. I hope ComEd's distribution engineers do not use these conclusions when sizing distribution systems.

Q. What do you think about ComEd's conclusion that "Most customers did not see a dramatic increase in their bills for electric service due to the institution of the SFV rate design"?

A. I have already demonstrated that low-use consumers will see a 54% increase while high use consumers experience half the increase. I think that is a pretty big difference.

Q. Comment on the final bullet point in Exhibit 2.33's Conclusion section -- that "Many accounts with low electricity usage have designations that indicate the electricity usage, or lack thereof, is for an overall building purpose, such as an alarm or fire pump that is rarely, if ever used, and are not for premises that are used for general day-to-day residential living purposes"?

A. ComEd's analysis of residential ratepayer data apparently includes exit signs and fire pumps on the same basis as residents. The substantive problem is that the Company seems to believe that a fire pump causes it to incur the same distribution costs as a mansion in Kenilworth. Rather than supporting high customer charges, this assertion is a good example of the unreasonable and discriminatory nature of allocating distribution capacity costs on a per customer basis and recovering those costs through the customer charge.

Q. Are the conclusions presented in Exhibit 2.33 informative on the relationship between the income and electricity usage of ComEd's ratepayers?

A. Only in showing that the relationship seems to remain a mystery to ComEd. The fundamental assertion of the study is that there really is no significant relationship between consumers' income and their use of electricity. The magnitude and geographic distribution of ComEd's uncollectibles alone should have alerted the Company that its study conclusions were suspect.

Q. Can you analyze the correlation of demand and usage?

A. Yes. Going beyond the obvious fact that without usage there can be no demand, I will use the residential load research to evaluate whether demand is statistically correlated to usage. If demand were not correlated to usage, a regression of usage and demand would show no relationship and the coefficient would not be significantly different than zero. Further, a distribution of consumer demand would show that different consumers have similar load and that the variation in load would be much less than the variation in usage.

ALTERNATIVE RATE DESIGN POSSIBILITIES

Q. What alternative did your analysis of ComEd's data suggest as a solution to the problems you have discussed?

A. 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.

Q. Describe how you developed the graduated account charges you propose.

A. In developing the alternative rate design, I have used a five step approach described below. The details of my approach are included in City Exhibit 1.1.

Step 1: Compute the true costs that are caused by a having a ComEd account related to the embedded cost of existing standard meters and the costs of printing and sending out a bill.

Step 2: Re-classify ComEd's cost of service separating the true costs caused by having an account from other costs the ComEd incorrectly classifies as customer related.

Step 3: Allocate costs that ComEd labels as customer related on the basis of usage rather than the number of ratepayers in the residential class (this lowers cost for the multi-family sub-class).

Step 4: Compute the amount of revenues that ComEd wants to collect through the customer charge for the different classes (reduce the amount for the multi-family class due to re-classification of costs in step 3). Compute the energy charge as the difference between the total revenue requirements for each class and the customer charge revenues divided by the energy usage in each sub-class.

Step 5: Use billing determinants separated by usage increment to derive a series of customer charges that produce the same level of revenues as the revenues computed from

Q. Do graduated account charges have beneficial effects that are not available with the single account charge for high and low users that ComEd has supported?

A. Yes. As I emphasize throughout this testimony, the Commission's directive respecting establishment of cost-based prices for an identifiable group of low use consumers cannot be accomplished simply by reverting to the rate structure that existed prior to the 2010 rate order or by reducing the account charge and increasing the energy charge. The cost-based variable account charge structure I propose would accomplish a number of objectives implicit in the Commission's directives.

First, the graduated account charges are accurately cost based, as the Public Utilities Act and Commission policy require, and they would be revenue neutral within

the residential class. The rate design would recognize that low use ratepayers (typically located in high density areas served by older, more depreciated, overhead facilities) impose lower costs of service. It is consistent, as well, with ComEd's desire to collect at least some of its distribution capacity costs through the account charge. While this proposed structure is new to Illinois, it would not be an extreme change. For some other large utility companies, such factors support an initial account charge of zero, with increasing charges with higher usage.

Second, the proposal is more consistent with principles of sound ratemaking. The graduated account charges would moderate cross-subsidies and the highly regressive nature of ComEd's current rate structure. The graduated charges also avoid an extreme price change as usage varies, by establishing gradual changes rather than one extreme jump that penalizes low use ratepayers. Third, the varying account charges also promote energy efficiency, consistent with legislative policy.

Fourth, administratively, the charges could be tailored to serve legislative or regulatory policy priorities, while remaining simple to implement. For example, if necessary, the charges could be adjusted for weather variations, it could be tied to usage during peak months, or it could be adjusted for other fluctuations to assure ComEd receives a stable level of revenues.

Q. Does this finally conclude your direct testimony?

A. Yes, with the exception of the delayed load research analyses I discussed at several points above, it does.