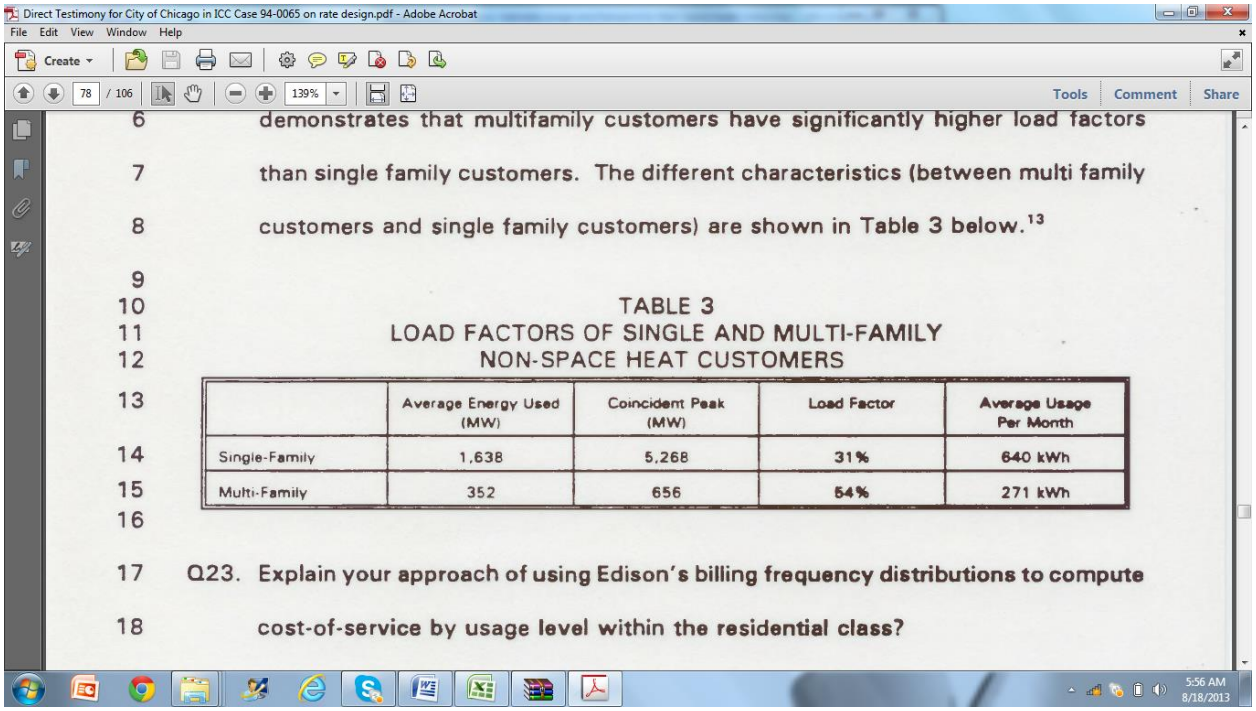


Direct Testimony for City of Chicago in ICC Case 94-0065 on rate design.pdf - Adobe Acrobat

demonstrates that multifamily customers have significantly higher load factors than single family customers. The different characteristics (between multi family customers and single family customers) are shown in Table 3 below.[13]

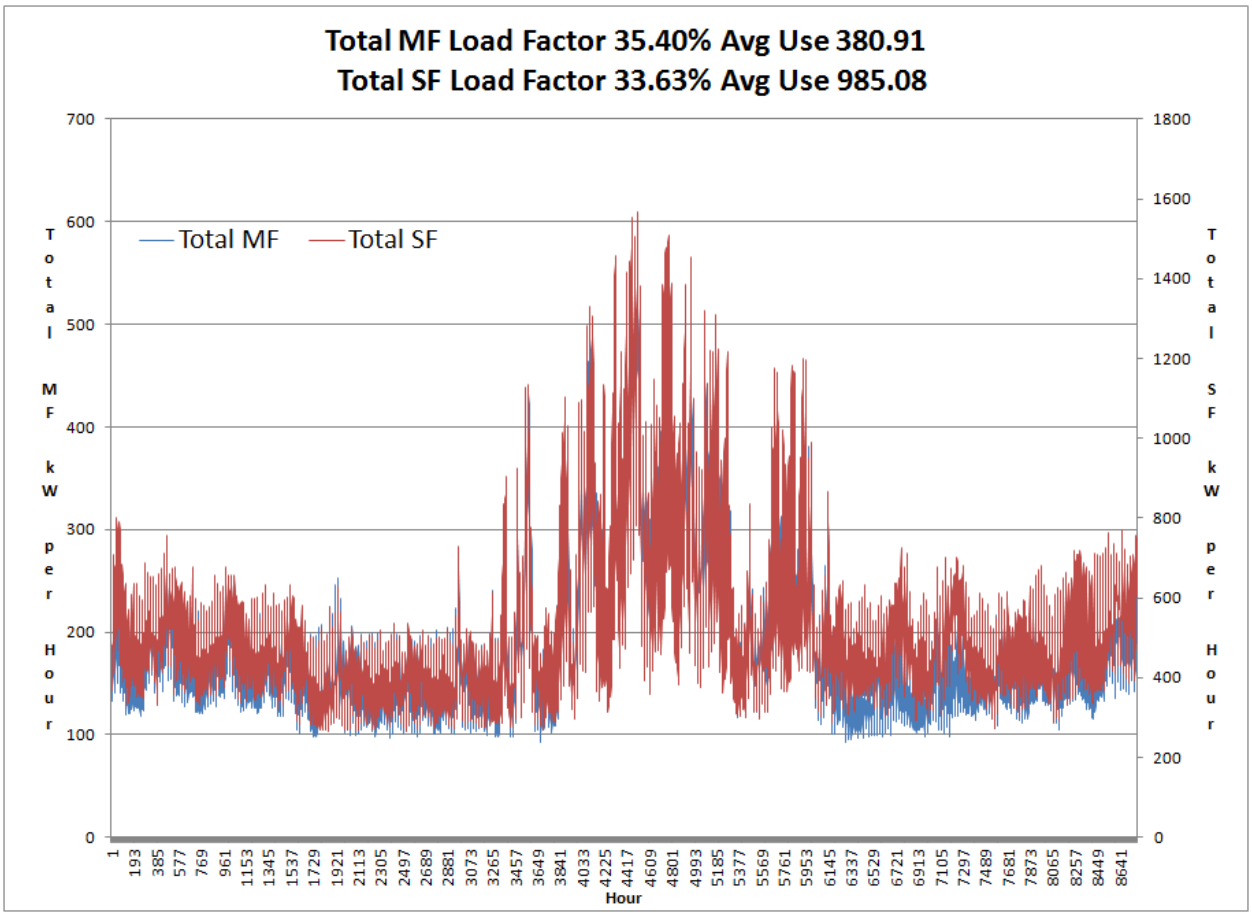
TABLE 3
LOAD FACTORS OF SINGLE AND MULTI-FAMILY
NON-SPACE HEAT CUSTOMERS

	Average Energy Used (MW)	Coincident Peak (MW)	Load Factor	Average Usage Per Month
Single-Family	1,638	5,268	31%	640 kWh
Multi-Family	352	656	54%	271 kWh

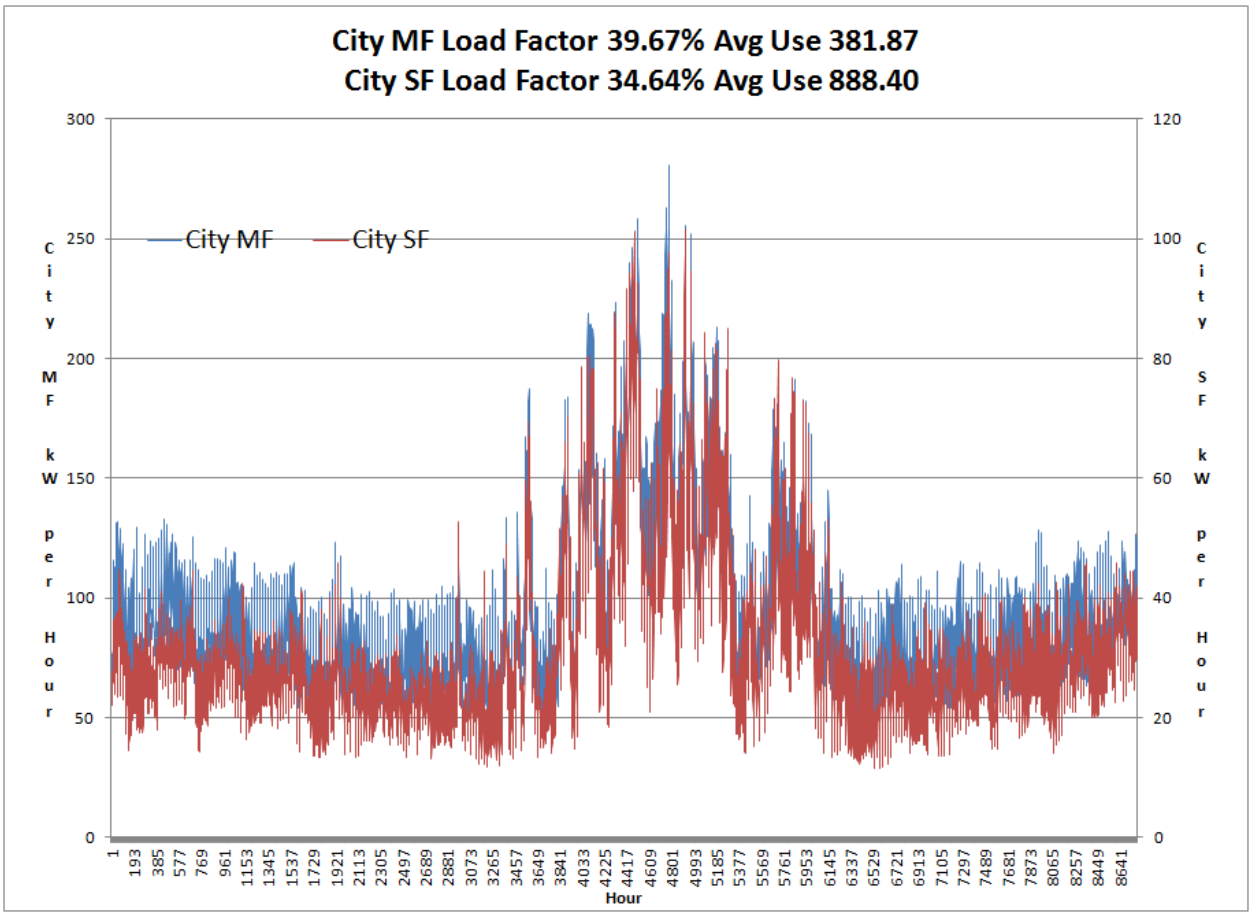
Q23. Explain your approach of using Edison's billing frequency distributions to compute cost-of-service by usage level within the residential class?

In the current load research the load factor has dramatically changed. Now the load factor for the two sub-classes is similar. This could be due to the following:

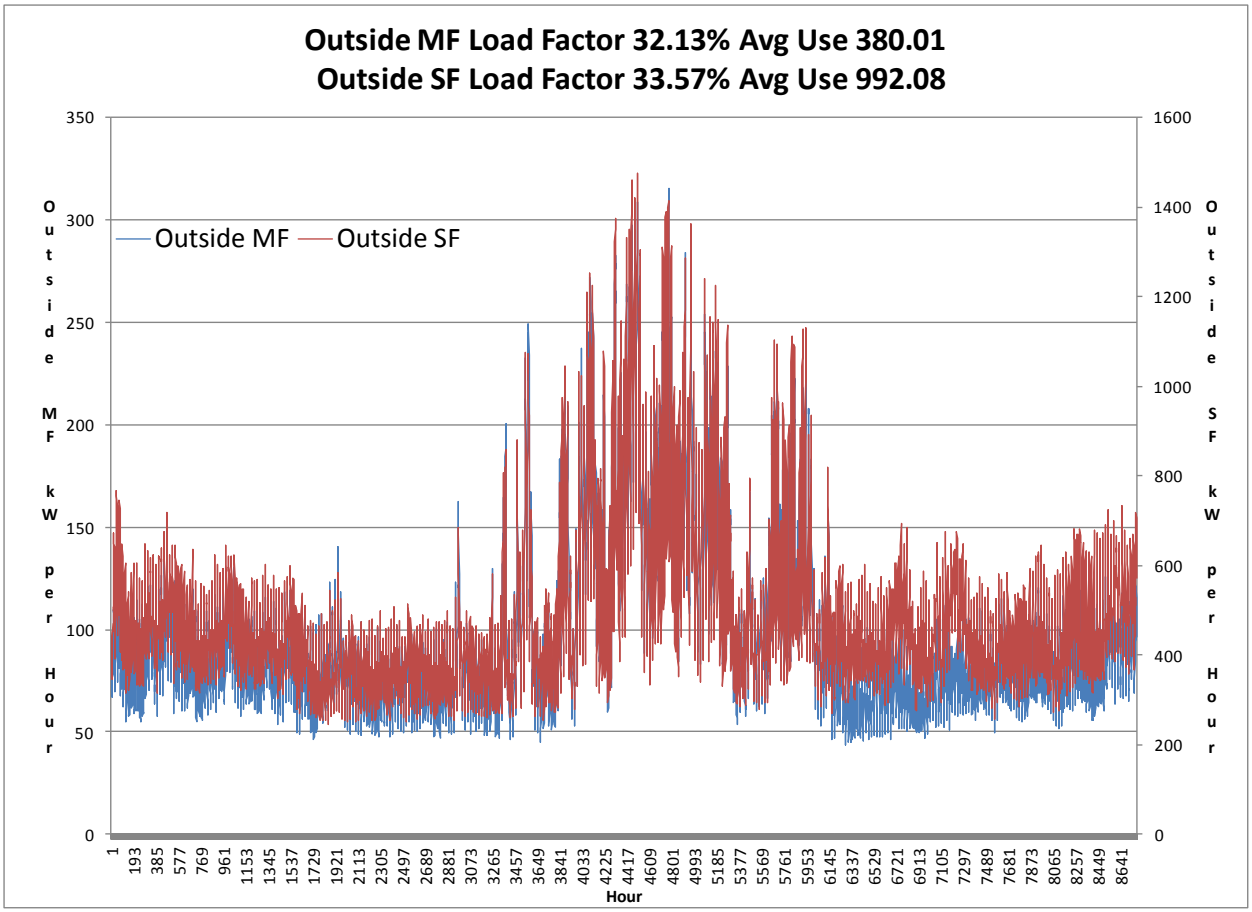
1. Increased use of air conditioners by multi-family consumers
2. Changes in the definition of multi-family and single family classes over the years in which non-detached homes are classified as multi-family units
3. Increases in inefficient condominiums in the suburbs that are added to the class
4. Biases in the load research



The next chart compares the multi-family and single family loads in the City of Chicago from the aggregated load research. Note that the load factor is higher for both the single family and multi-family classes in the City relative to the aggregate single and multi family load factors for whole system. Further, the average use in the sample is higher than the overall average use in the City.



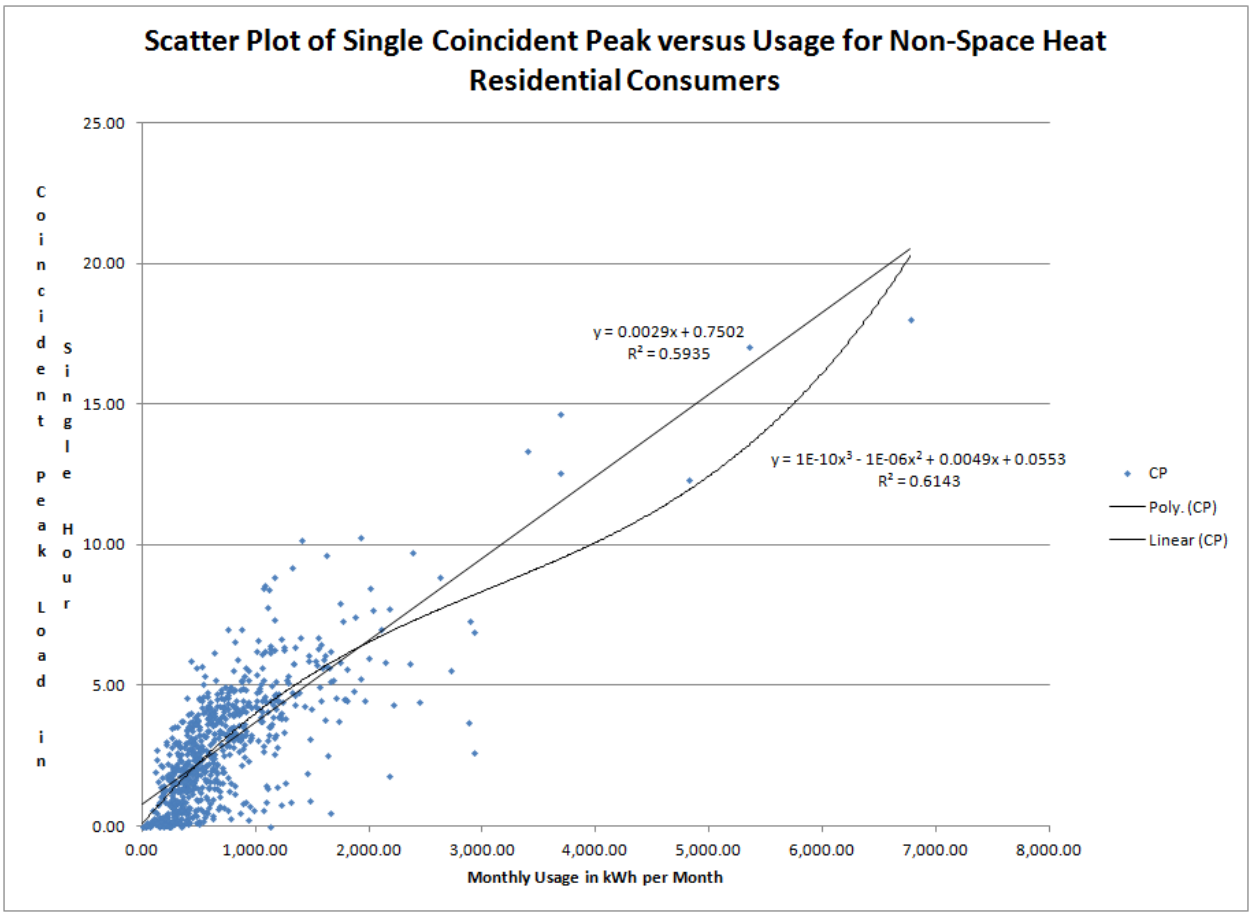
The outside city load factor for multi-family was only 32% as shown on the graph below. As with the City usage, the outside City usage is higher for the sample than the actual population average. To demonstrate the cost of service effects of the 39% load factor relative to the 32% load factor for multi-family consumers inside and outside the city one can first compute the reciprocal of the load factor. This statistic measures the peak load responsibility per kWh used. For City consumers the number is 2.52. For outside city multi-family consumers the number is 3.11. The difference between 3.11 and 2.52 implies that the cost of service outside the City should be 23% higher than the cost of service inside the City because of the differences in the efficiency of energy usage.



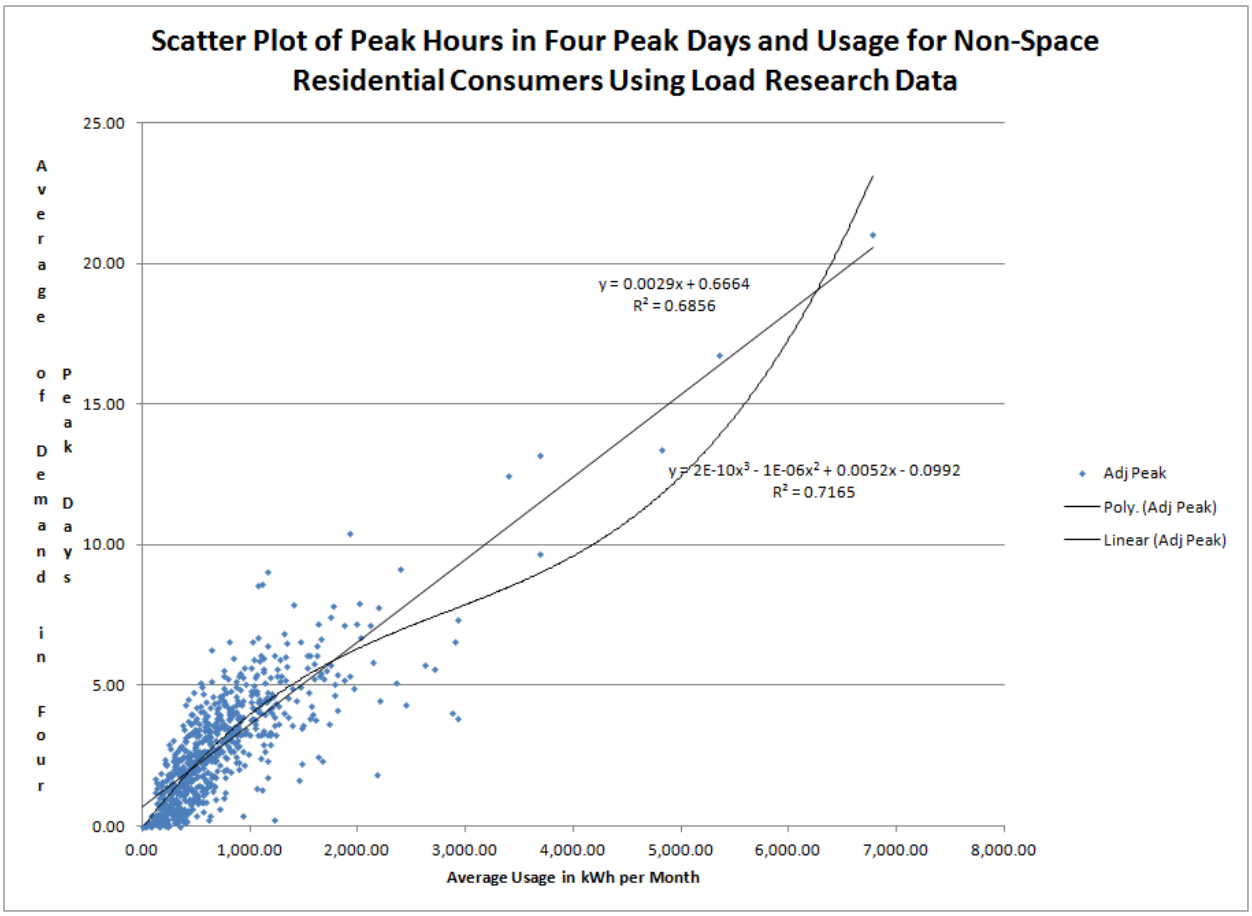
Use of Load Research to Evaluate Peak and Use Correlation

The final section uses data from the load research to further evaluate the issue of the demand usage relationship. The same type of scatter plots and statistical analysis is presented in terms of individual consumer by consumer scatter plots and scatter plots for usage groupings.

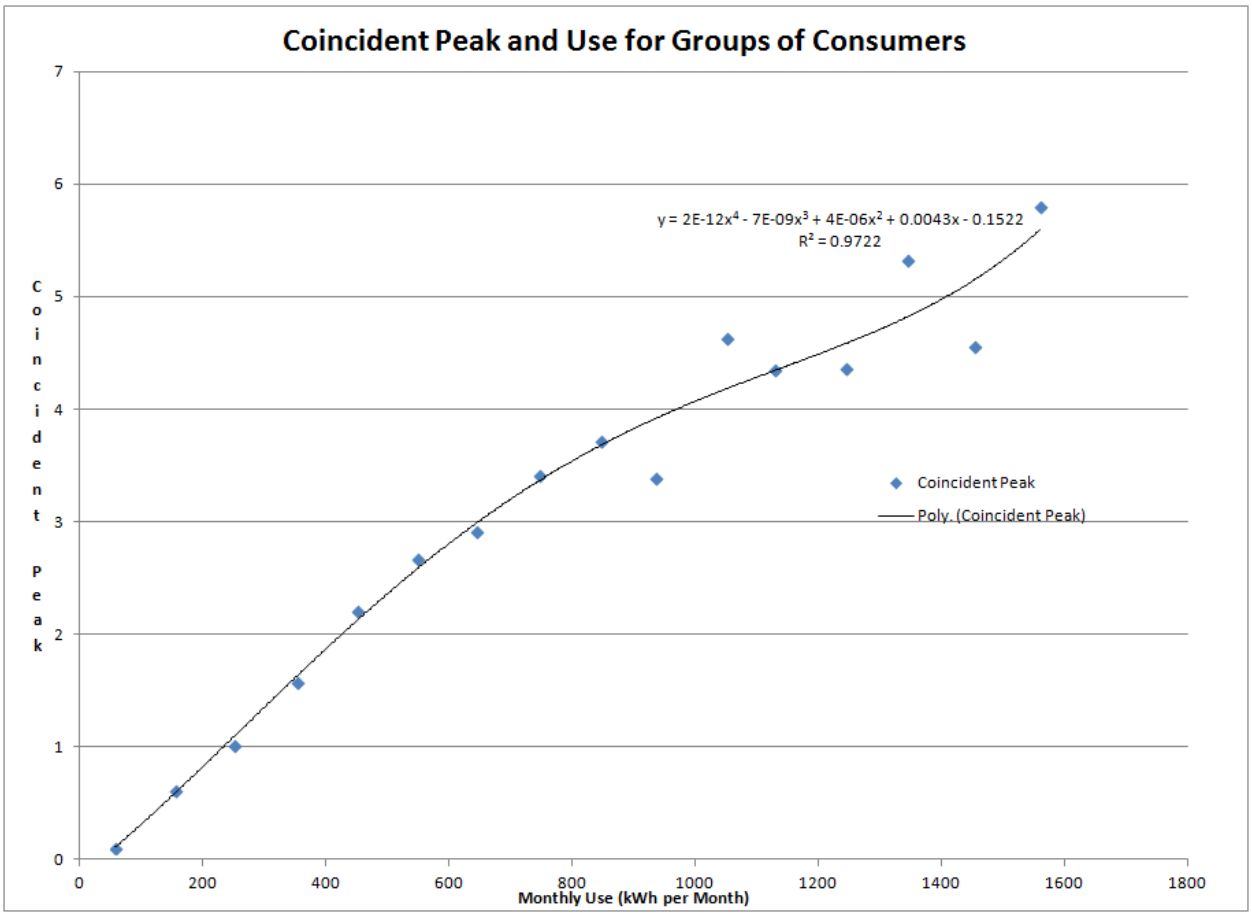
The graph below plots the energy use at the time of the system peak and the average monthly usage over the year for each of the consumers in the sample. The R-squared is lower than the R-squared for the usage data as there is a lot of variation in a single hour of peak demand due to randomness that may occur on the particular day of the peak. When a polynomial line is fit to the data, the line crosses the y-axis at below zero.



Given the vagaries in hourly loads, a second analysis has been developed where the average of the peak load in the four highest peak days of the system is used rather than the single peak. This analysis removes some of the variation and results in a higher R-squared.



When grouping consumers into usage classes (this time by 100 kWh increments because of the fewer data points) the relationship between usage and peak becomes clear. The R-squared is very high and the fitted line crosses the y-axis at a level below zero. This implies that no variation in peak demand can be attributed to the existence of being a ratepayer.



Sudden Changes in Usage and Demand from Consumer Vacancies and the Load Research Data

One of the principal conclusions in ComEd's Exhibit 2.33 was that houses or apartments in close proximity could have large variations in use. Given the variation in use, the implication is that any address can suddenly become a large or a small user and distribution facilities must be built for a contingency that a small user can become a large user. ComEd explained its finding as follows:

"in comparing the lowest to the highest percentile customers that were located in the City of Chicago, 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. Overall, within the City of Chicago, for the SFNH Class, of the 1,463 customers that are in Percentile 100, 244 of them (16.7%) are located in the same

hundred block and street as customers that are in Percentile 1. For the MFNH Class, of the 5,181 customers that are in Percentile 100, over 1,000 are located in the same hundred block and street as customers that are in Percentile 1.

This section demonstrates that:

- ComEd's finding is simply the result of vacancies in homes or billing errors --when a large home is vacant because people are moving it would be expected to find large users near low users (where usage is defined per month as in the ComEd study). This is demonstrated by graphs from the load research data.

- ComEd's finding also could be driven by vacations where large homes have low usage when nobody is living in the home for a period. This is again demonstrated by the load research data.

- ComEd's suggestion that regions can have large swings in usage and that usage cannot be predicted by the type of housing in a region is wrong. Data comparing the City of Chicago to the outside city regions demonstrate a stable relationship over time.

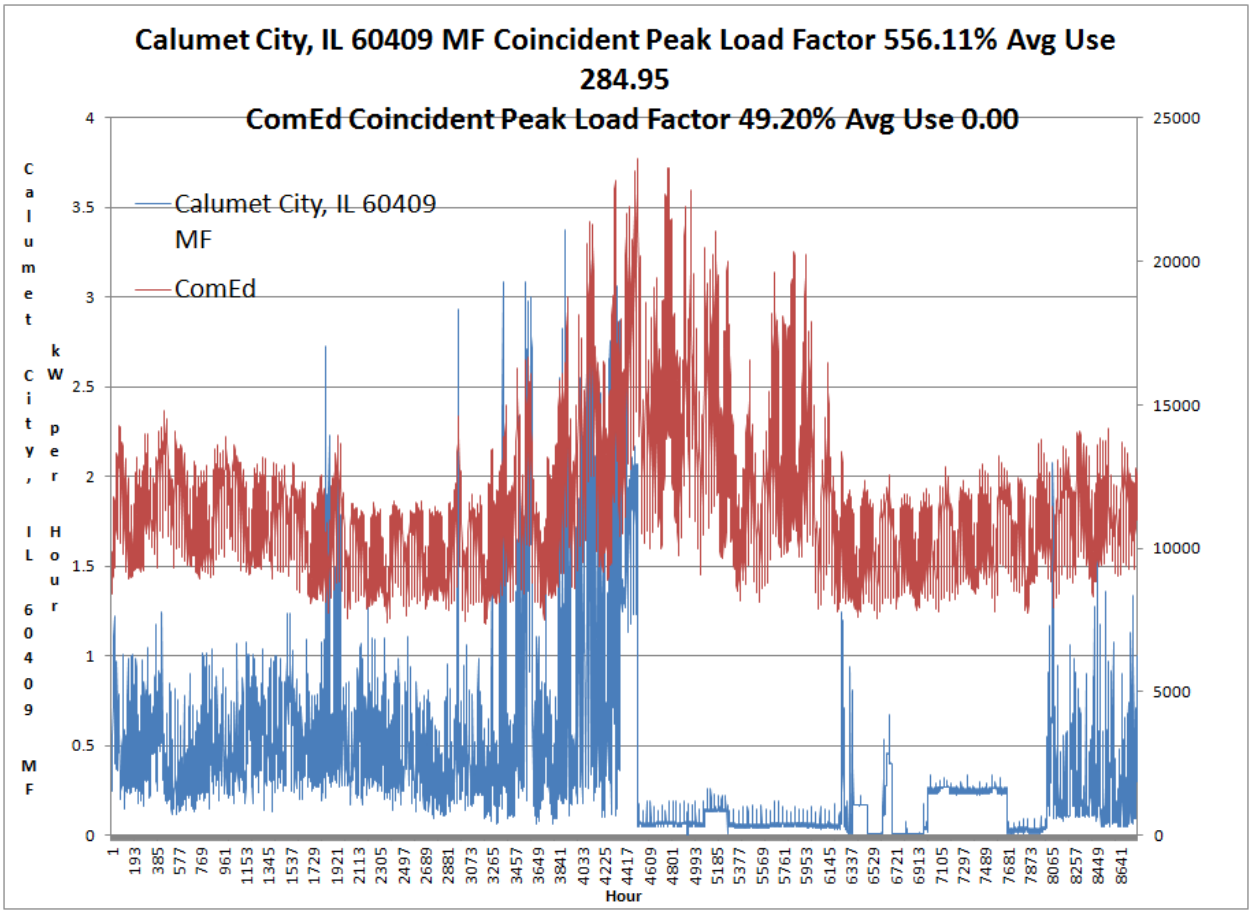
- ComEd's implication that it must build all facilities on the basis of the highest possible load of a single ratepayer account does not conform to the data. If a small studio apartment has some months of low usage because of vacancy, it does not follow that this small apartment with a period of low usage has the same distribution requirements as a large mansion in a wealthy suburb where there also may be vacancies because of people moving and/or people taking vacations. The load research data demonstrates this obvious point by showing that apartments in the same area have very similar use after accounting for vacancies. Similarly, single family homes in wealthy suburbs also have consistent usage over extended periods even though there are occasional periods of low use.

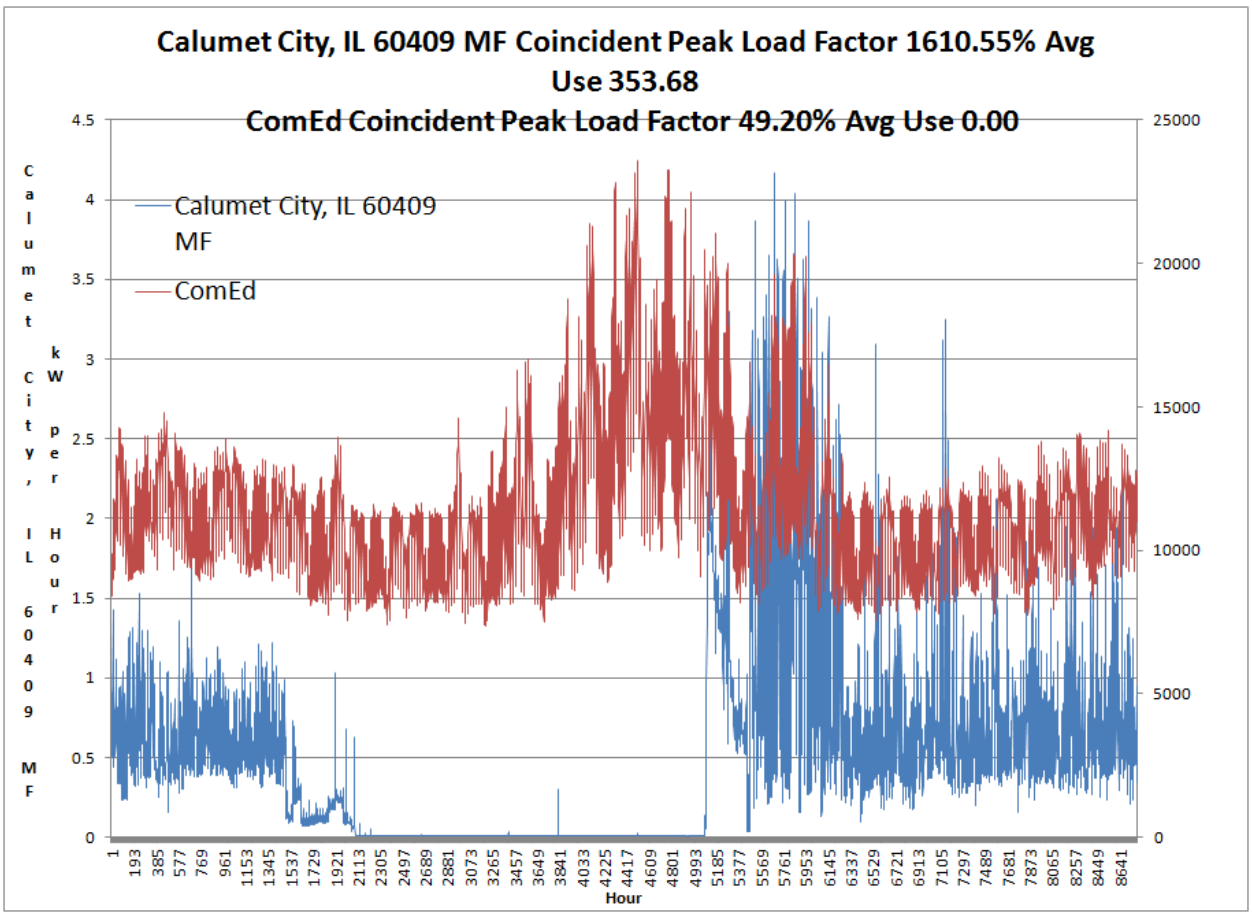
Load Research Data Demonstrates that ComEd's Finding is the Result of Vacancy Due to Moving or Vacations

The graphs below illustrate the issue of low use from moves or vacations. The graphs demonstrate that cases where low use occurs for temporary periods. These cases could be classified as the one percent low usage percentile in ComEd's study. The various cases demonstrate that the low use is temporary and the typical use returns after the low use period. When the usage returns to the normal level, it is stable at the level that is defined by the housing type.

The first two graphs show usage for consumers in an apartment in Calumet City. The decline in usage shown in the graphs is probably the result of people moving out of the apartment. Note that the different consumers have similar average usage and that usage returns to the average after the vacancy.

The implication of this analysis is that the amount of distribution equipment required for different dwellings is not significantly influenced because of low use during periods of people moving.





The three graphs below show load research data for single family homes where usage suddenly falls and could result in the addresses falling into the 1 percentile category. Falls in demand below could be due to errors in the collection of load research data; people taking vacations or people moving. The key point is that after the load falls it returns and the temporary falls in demand do not have any influence on the required distribution equipment driven by demand.