

Rockland Electric Company

Load Profiling Methodology

Rockland Electric Company has developed average hourly load profiles of customers who are not currently hourly metered using commonly accepted profiling and sampling techniques. Large C&I customers in service class 7 are all hourly metered and are considered to have 100% statistical representation. The load profile is a series of 24 time ordered values representing the average hourly demand of a group of customers in a rate class. Using load data collected from a statistically derived sample of consumers with interval meters, customers are assigned prototypical load profiles. Customers with similar characteristics are segmented into strata based on typical usage breakpoints.

Each profile specifies customer energy usage for every pool interval (hourly), while adjustment factors such as temperature and day type (i.e. weekday or weekend) are considered when developing each profile. Once all criteria are obtained for a particular group of customers, a daily load profile is developed. Monthly load shapes are then constructed by combining daily load shapes for that month. The estimated usage of each supplier's customers for each pool interval is then aggregated. Each supplier's aggregated customer usage estimates are then used in the settlement process. The goal is that each customer in the Rockland Electric territory, with the exception of the largest C&I customers, will be assigned a load profile by strata and their rate class.

The number of profiles are as follows:

Residential will have 475 class average load profiles for 5 strata

5 strata * 5 weekdays * 12 months = 300
5 strata * 1 Saturday * 12 months = 60
5 strata * 1 Sunday * 12 months = 60
5 strata * 10 Holidays = 50
5 strata * 1 PreHoliday weekday = 5

For rate class 102 we will have 475 class average load profiles for 5 strata.

5 strata * 5 weekdays * 12 months = 300
5 strata * 1 Saturday * 12 months = 60
5 strata * 1 Sunday * 12 months = 60
5 strata * 10 Holidays = 50
5 strata * 1 PreHoliday weekday = 5

Except for Time of Use customers (there will be approximately 665 for 7 strata over the remaining rate classes. See Guidelines, below)

7 strata * 5 weekdays * 12 months = 420
7 strata * 1 Saturday * 12 months = 84
7 strata * 1 Sunday * 12 months = 84
7 strata * 10 Holidays = 70
7 strata * 1 PreHoliday weekday = 7

Statistical Sample Design Methodology

The accuracy of our current load sample is measured by a standard level of statistical confidence and precision. A validation procedure is used which yields a coefficient of variation from which the confidence level and precision levels are calculated.

The load samples were developed using LodeStar statistical sampling software. The sample methodology used selects the optimum number of sample points per strata using the PURPA required statistical confidence level of 90% and precision range of 10%. Samples were designed using stratified sampling techniques to ensure accuracy for those rate classes in which profiles exist. The new load study sample is being designed at a confidence level of 90% and 10% precision for both the residential and C&I customers. It should also be recognized that customer size and type are important factors in determining whether load profiles are used.

The dimension or design variable used is the peak month kwh. In order to define the strata boundaries or breakpoints the Dalenius-Hodges statistical technique is used. The Neyman allocation procedure is used to determine the optimum sample size for each stratum. The Neyman allocation method for determining the sample size for each stratum is function of population size and the standard deviation. Customer-to-customer variation is the basic determinant of sample size within a stratum (the more variation the larger the sample size). In a stratified sample this variation should be less than taking a random sample of the entire population, thus fewer sample points are required to get the same accuracy level. A simple random sample is then performed on each stratum.

Statistical samples can also be segmented by customer demand, by customer type, or by any number of criteria. Our current load sample consists of 463 sample points, plus approximately 14 load recorders on all of our SC7 customers.

If a new sample design is implemented, the existing load sample may change both respect to the number of strata required in each rate class and may include coverage of rate codes that are currently not sampled. The new design would be in accordance with PURPA 90% confidence level and 10% precision requirements to achieve statistical accuracy of utility load research samples.

CUSTOMER STRATUM GUIDELINES FOR RETAIL ACCESS

The Supplier will be provided with the 24 month billing history from the customer as well as the strata to which the customer belongs. Based upon this information, the Supplier will aggregate its load, by strata, and schedule the deliveries consistent with the appropriate load shapes.

Service Class	Input Variable	Strata	Lower Limit	Upper Limit
SC1 Rate Code 101/301	Peak Month kWh	RC301 Strata 1	0	600
General Residential	Peak Month kWh	RC301 Strata 2	601	1,200
	Peak Month kWh	RC301 Strata 3	1,201	2,000
	Peak Month kWh	RC301 Strata 4	2,001	3,800
	Peak Month kWh	RC301 Strata 5	3,801	999999
SC 1 Rate Code 401 Residential		RC401		
w/ Water Heating				
SC 1 Rate Code 501 Residential		RC501		
w/ Space and Water Heating				
SC 1 Rate Code 601 Residential		RC601		
w/ Heat Pump				
SC 2 Rate Code 102	Peak Month kW	RC102 Strata 1	0	6
General Service C&I	Peak Month kW	RC102 Strata 2	7	16
	Peak Month kW	RC102 Strata 3	17	35
	Peak Month kW	RC102 Strata 4	36	80
	Peak Month kW	RC102 Strata 5	81	199
SC 2 Rate Code 402 C&I	Peak Month kWh	RC402 Strata 1	0	4,000
Separately Metered Space Heat	Peak Month kWh	RC402 Strata 2	4,001	20,000
	Peak Month kWh	RC402 Strata 3	20,001	100,000
	Peak Month kWh	RC402 Strata 4	100,001	300,000
SC 2 Rate Code 902 Small C & I	Peak Month kWh	RC902 Strata 1	0	150
General Service - Secondary				
(non-demand metered)	Peak Month kWh	RC902 Strata 2	151	500
	Peak Month kWh	RC902 Strata 3	501	3,000
SC 2 Rate Code 202 Small C & I		RC202	>100kW	
General Service - Primary				
SC 2 Rate Code 502 Large Commercial - Primary 502		RC502	>200 kW	
SC 2 Rate Code 702 Large Industrial - Primary		RC702	>200 kW	
SC 7 Large C & I >1000 kW	Individual 8760		>1000 kW	
SC4 & SC6 Public/Private Lighting	Monthly Burn Hrs	RC104		
RC104&RC106 through RC506				
SC 2 Rate Code 802 Small C&I - Secondary	24 Hr Straight Line	RC802		