

LONG RANGE LOAD FORECASTING

SCAMPS

2016 ANNUAL MEETING

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Why Perform Load Forecasts?

The obvious answer to the question **“Why Perform Load Forecasts”** is **“So you have an accurate projection of future loads to use for your work purposes”**.

There are fundamentally two types of load forecasts:

1. “Short Range” – hourly loads (kW) expected for the next 24 hours
2. “Long Range” – energy (kWh) for some desired time (daily, weekly, monthly, or annual) and the associated peak demands (kW) during those times.

Short Range load forecasts are typically used to help make decisions regarding the dispatch of generators (such as load-side generators) or to know when to implement load management actions. Long Range load forecasts are typically used to plan for system expansions, to project budget revenues, or to perform cost of service and rate studies.

This paper will focus on Long Range load forecasting techniques.

What you want to do to perform the forecast is:

1. Prepare the forecast considering small “key” components that impact future loads and individually project these components.
2. Prepare the forecast such that down the road, you can review the key components that actually occur and update those components that have changed differently than expected, then reassemble your updated total forecast. In this manner, you can always have a forwarding looking updated forecast.

Let’s be clear about one thing. No matter how detailed a load forecast you perform, it is unlikely that actual future loads will be exactly as you forecasted. Unexpected changes in growth driving parameters will occur. But, by preparing the forecast considering small key driving components, portions of the forecast that develop differently than expected can be modified and an updated forecast prepared.

Load Forecasting Techniques

All load forecasts are, to some degree, based on historical data and when available, known information about future expected developments. To understand how historical data is used to forecast future values, let's review the classical application of "regression analysis".

REGRESSION ANALYSIS

The simplest and perhaps oldest method of load forecasting is to develop a mathematical equation based on a "*least-squared-error regression curve fit*" of historical load data and extrapolate this equation into the future. A "least-squared-error regression" analysis is the determination of a mathematical equation in which the dependent variable, when charted, fits among the historical data points with minimum error, i.e. smallest sum of the square of the difference between each data point and the equation values. The reason "squared error" is the basis of the equation development is because a negative "error", or difference between a data point and the equation, is as much an "error" in magnitude as a positive difference. By squaring the error, all squared error values are positive. Then, the determination of an equation with the least sum of squared-error is the equation with the least magnitude of total error, or best fit.

Two common mathematical equations for a least-squared-error analysis are:

1. **Constant Growth**, $Y_G = A * B^x$, where "x" values are typically time periods, such as years, "Y_G" values are the calculated loads at time "x" values, "A" is the calculated load when x=0, and B is (1 + Growth Rate). The two constants "A" and "B" can be determined for a constant growth equation that fits among the historical data points with the least amount of summed squared error.
2. **Straight Line**, $Y_{SL} = m * x + b$, where "x" values are typically time periods, such as years, "Y_{SL}" values are the calculated loads at time "x" values, "b" is the calculated load when x=0, and m is the slope of the line. The two constants "m" and "b" can be determined for the straight line equation that fits among the historical data points with the least amount of summed squared error.

For each of these two equations, the constants are fundamentally determined the same way. *First*, write the equations for the summation of the square of the difference between each data point and the equation. *Second*, take the partial derivatives of the equation with respect to each unknown constant and set the partial derivatives equal to zero (minimal points). *Third*, solve the equations for the two unknown constants. For both constant growth and straight line methods, since there are two unknowns in each equation, this exercise becomes the solution of two simultaneous equations for two

unknowns. Once you have calculated the two constants for each equation, you have the two different types of equations that fit among the historical data with the least sum of error squared. You can pick the one that you feel offers the best fit. Usually the Constant Growth equation is selected for load growth trending.

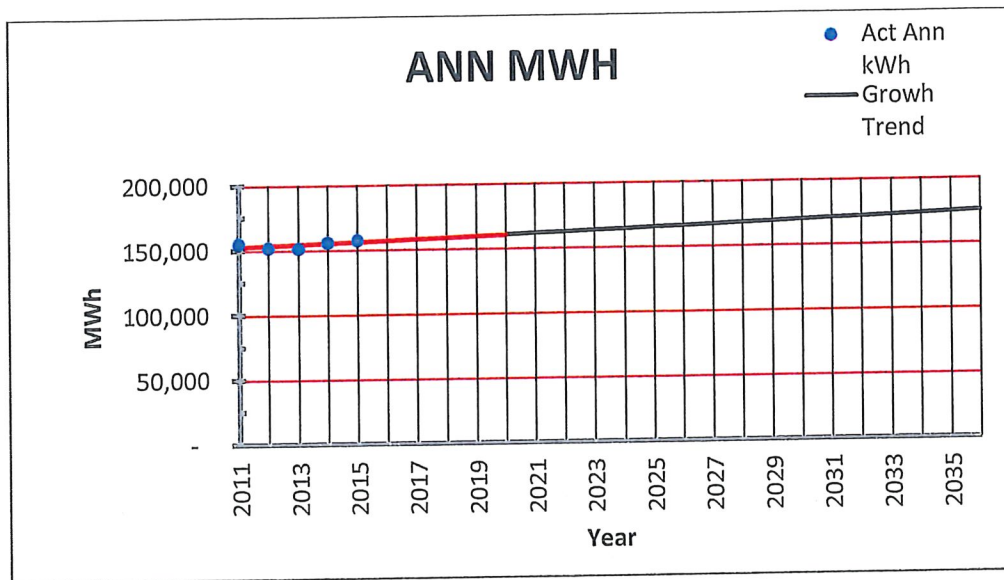
We're lucky! We do not need to re-learn how to perform partial differential equations or solve simultaneous equations for the unknowns. Excel will do this work for us and return the constants for the equations for methods 1 and 2 above.

Let's look at an example of using the two methods to develop the constant growth equation and the straight line equations for total annual energy consumptions. Table 1 shows the annual energy consumptions for a utility from 2011 through 2015, 5 years. The table includes all customer load classes as well as energy losses. The Constant Growth equation is: $Y_G = 152,343 * 1.0054 ^ x$. The constant annual growth of the equation that fits among this data is 0.54 %/year. The Straight Line equation is: $Y_{SL} = 838 * x + 152,328$. The constant slope of the equation is 838 kWh/yr. Each of these equations can be extrapolated into the future to predict future values.

Table 1

Yr.	Yr. Count	Act. MWh	$Y_G = a * b^{x^x}$		m
			Gr. Trend MWh	Lin. Trend MWh	
			$Y_G = a * b^{x^x}$ 1.00540 152,343	$Y_{SL} = m * x + b$ 838 152,328	b b
2011	1	155,640	153,166	153,166	
2012	2	152,418	153,993	154,004	
2013	3	151,857	154,824	154,842	
2014	4	156,507	155,661	155,680	
2015	5	157,786	156,501	156,518	
2016	6		157,346	157,356	
2017	7		158,196	158,194	
2018	8		159,050	159,032	
2019	9		159,909	159,870	
2020	10		160,773	160,708	
2021	11		161,641	161,546	
2022	12		162,514	162,384	
2023	13		163,392	163,222	
2024	14		164,274	164,060	
2025	15		165,161	164,898	
2026	16		166,053	165,736	
2027	17		166,950	166,575	
2028	18		167,852	167,413	
2029	19		168,758	168,251	
2030	20		169,669	169,089	
2031	21		170,586	169,927	
2032	22		171,507	170,765	
2033	23		172,433	171,603	
2034	24		173,364	172,441	
2035	25		174,301	173,279	
2036	26		175,242	174,117	

Chart of Table 1 Data – Regression Analysis



The problem with this “simple regression analysis” approach is, while we will determine an equation that is the “best fit” among the historical data points, what reason do we have to expect that the trend will continue into the future, and how long can we expect that trend to last? What if the service area is becoming saturated with customers? We surely cannot expect that a trend growth in that area will continue forever. What are the underlying “driving” reasons for the historical change in load? If we can determine these reasons, develop a least-squared curve fit based on these “driving” independent values and can project these “driving” variables into the future, we will have an accurate forecast of future load.

HISTORICAL LOAD DATA

You have at your fingertips considerable information you can use to develop a detailed load forecast. For example, you likely have a record of your monthly total energy consumption, monthly peak demands, and monthly loads coincident with your main power supplier (called coincident peak loads, or CP). You also have monthly billing data for each class of customer such as residential, commercial, industrial, City, utility, special, outdoor lighting, etc. You have a record of the number of customers billed each month for each class of customer. This data, along with other available weather and economic data, can be used to prepare an accurate forecast for each customer class and for the total system, including system losses.

LOAD FORECAST COMPONENTS

Consider the residential class of customers. For a reasonable historical period, say five to 10 years, you know the total monthly energy sales for your residential customers and you know the number of customers you served each month. The total residential energy sales each month is the product of the number of residential customers you served during the month times the average residential energy consumption for that month. The historical average energy use per residential customer is the total residential energy divided by the number of residential customers. Looking to the future, the residential load each month will be the product of the expected future number of customers times the expected future average energy use per customer for each month. If you can develop a good forecast of these two parameters, you can develop a very accurate load forecast for residential customers.

The same can be said for each of your other class of customers; commercial, industrial, City, utility, special, outdoor lightning, etc.

Factors Affecting Number of Customers

If you examine your historical number of customers by class, you will likely notice a trend change. If you are in a growth area, you will see an upward trend in the number of customers. If you are in a more economically depressed area, you likely will see either no growth, or perhaps even a loss of customers. In some cases, you may see an increase in one class of customer, say commercial customers, and a flat or slight decline in another class of customer, say residential customers. The number of customers is certainly driven by the health of the economy in your town, but the number of customers is also driven by how saturated your service area is with customers. If your town is surrounded by other electric utilities such as Investor Owned Utilities (IOUs) or Cooperatives in which the undeveloped areas are assigned to them by the Public Service Commission, your available growth area may be blocked and your area inside the city limits may be saturated. In these cases, your opportunity for growth is through annexation. A few of our SC municipals have learned the pain that can be associated with acquiring growth territory from local cooperatives because of the SC statute 1360. Never the less, annexation, carefully performed, is a way to grow number of customers.

We believe you should chart your monthly historical number of customers for each class, and perform a simple growth regression analysis of the average monthly number to determine what classes are growing and what classes are staying the same or declining. We have found that there will be some seasonal adjustment in number of customers. To account for this, we calculate the per unit number of monthly customers compared to the annual average number of customers. We then average the per unit

values for each month and use the results to pro-rate the monthly future number of average annual customers.

LOAD GROWTH PARAMETERS

What are some parameters that impacted historical loads and future loads? There are many, and each has different impacts on the future. Some of the key parameters that impact load growth are:

- Number of customers
- Area saturation
- Expected annexation
- Unemployment
- Weather conditions, Heating Degree Days (HDD) and Cooling Degree Days (CDD)
- Economic Conditions – Gross Domestic Product, which can be further subdivided into changes in number of workers and changes in productivity
- New products that use electric power such as appliances, computers, and electric vehicles
- Relative cost of electric power, \$/kWh

The first work to do is to tabulate your historical data by your customer classes. For each customer class, tabulate the monthly number of customers, monthly energy sales, and calculate the average monthly consumption per customer by dividing the monthly sales by the monthly number of customers. In the appendix of this paper is this type detail for a utility's Residential customers. Note that the following monthly data is tabulated:

- Number of customers
- Monthly energy consumption
- Calculated monthly average energy use/customer
- Monthly Heating Degree Days in per unit of the average (HDD)
- Monthly Cooling Degree Days in per unit of the average (CDD)
- Monthly cost of energy, all adjusted to 2009 base using Consumer Price Indices
- US Monthly Productivity (Gross Domestic Product / Work Force number)
- Employment (1 minus Unemployment) for a SC County of interest

A regression least squared error curve fit of this data using the Growth Method produces the Monthly Energy Use Equation

$$Y_G = 266.5 * 1.162^{\wedge\text{HDD}} * 1.227^{\wedge\text{CDD}} * 0.027^{\wedge\text{Cost}} * 1.0003^{\wedge\text{Prod}} \text{ kWh/Mo.}$$

When any of the independent values are zero, the equation result for that value is 1.0. Also included in the Appendix of this paper are charts of the projections in number of customers, by class, and the energy use/customer for all of one municipal utility's total customer base.

Total System Forecast Results

The analysis techniques can be applied to each class of customers served by the utility. Included in the appendix of this paper is a table with the results of a Load Forecast analysis for each customer class and the total system. The table includes the monthly energy losses, total monthly Load Factors, total system NCP, and monthly power factors. Also included with this table are charts of the projected number of customers and energy use per customer for each of one utility's customer classes.

Forecast Model Updates

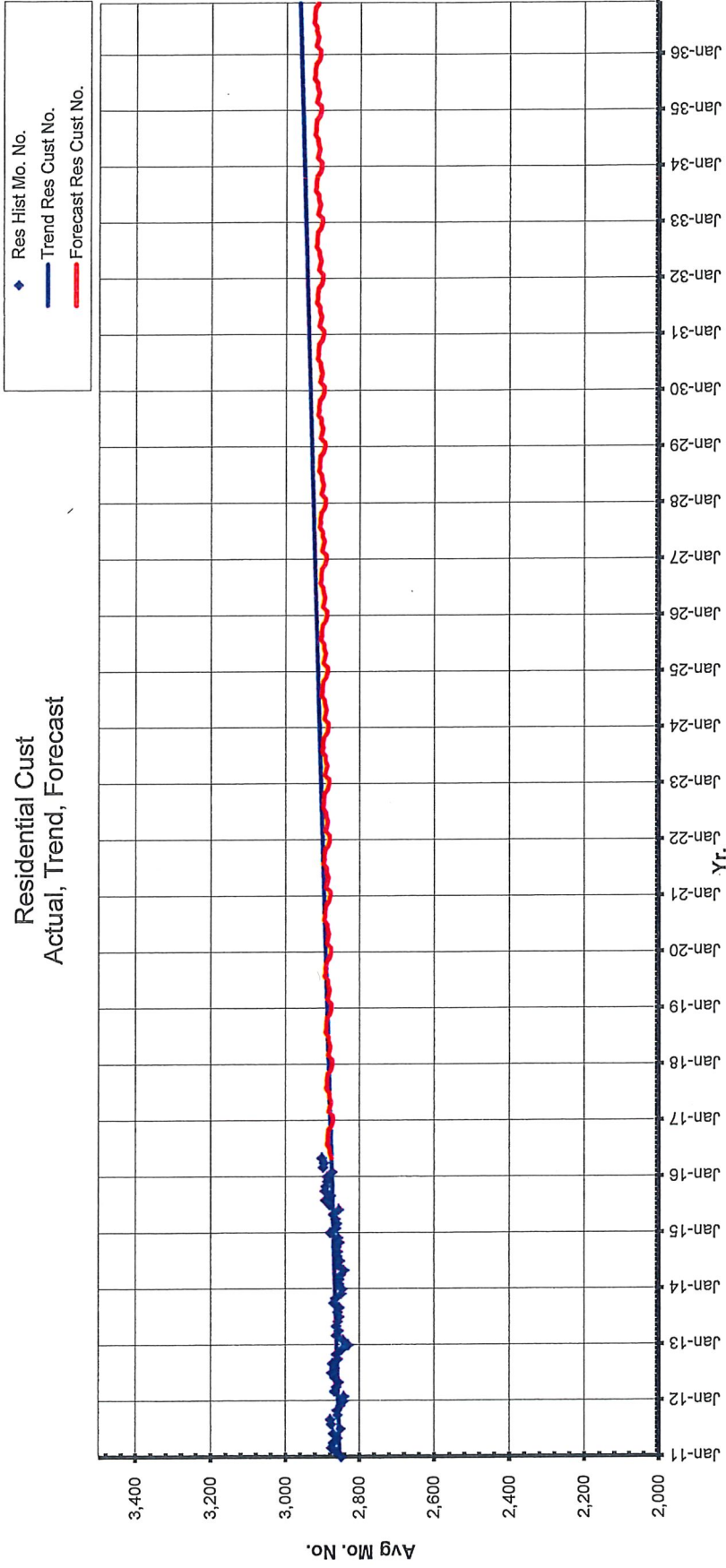
As stated earlier in this paper, future loads will unlikely develop exactly as forecasted. Usually, something will develop differently than expected. The beauty of this forecasting technique is, you can review what actually develops, make adjustments to just that changed part, and then re-assemble the spreadsheets and charts, producing a revised and updated forecast. In this manner, you can always have a current, forward-looking forecast of your system loads.

APPENDIX

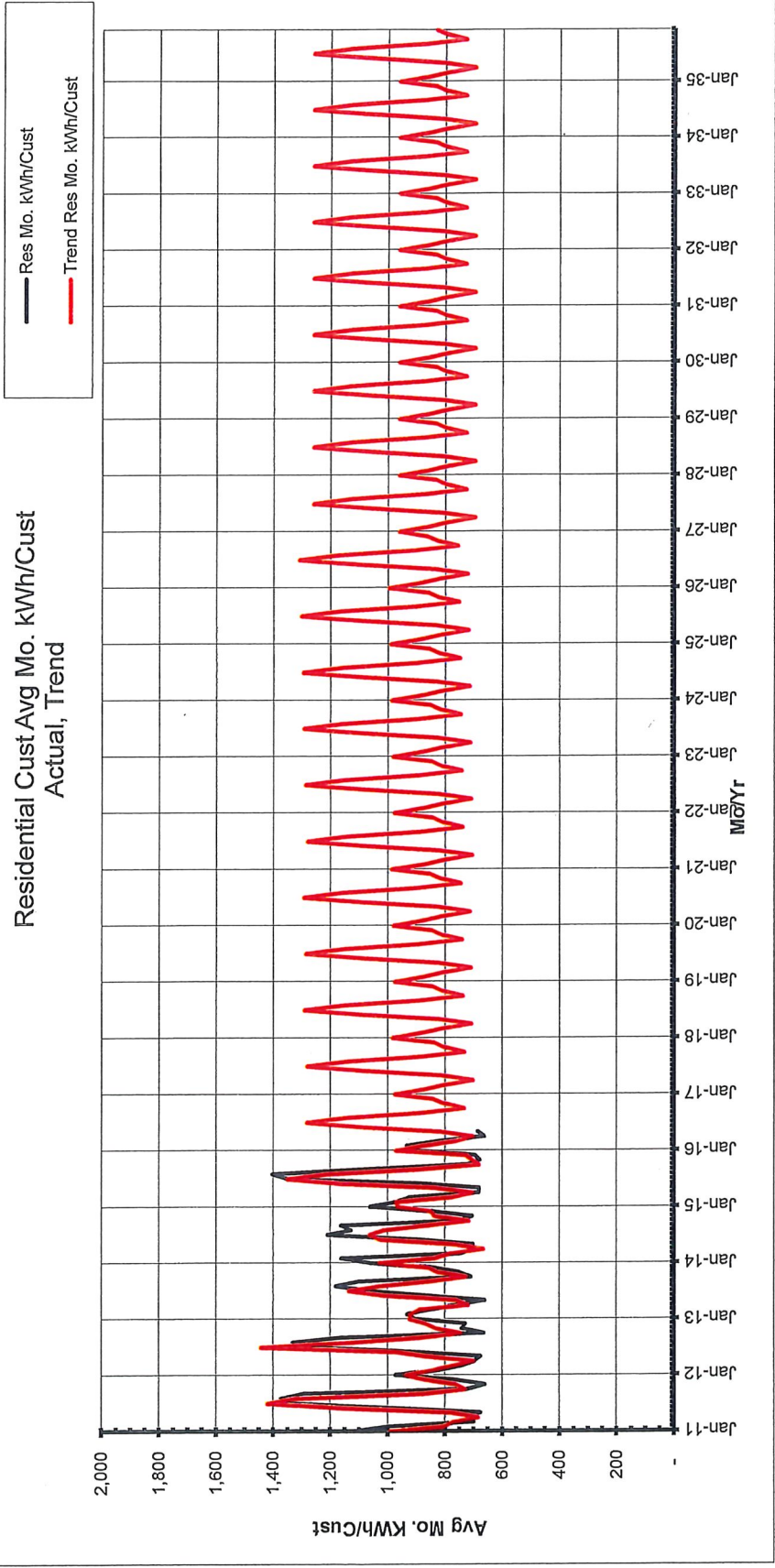
RESIDENTIAL CUST FORECAST

Reg Res R	Mo/Yr	Mo. Count	No. Cust.	Per Unit of Avg. No. Cust.	1,00012 2,854	Trend Mo. No. Cust.	Forecast No. Cust.	Energy - kWh	Energy/Cust - kWh	HDD p.u.	CDD p.u.	Cost/kWh - 2009 \$	Elec. Cost/kWh - 2009 \$	US Mo. Productivity - 2009 \$	Ocotelec Co. - %	Act Ann kWh/Cust	Trend Ann kWh/Cust	Yr. Count	Chart	Yr. Avg	Yr. Mo. p.u. of Ann Avg	Ann. Avg. No. Cust.	Trend Ann Avg No. Cust.	Forecast Cust.	1,00065 2,858	0,99951
	Jan-16	61	2,888	1,00365	-	2,875	2,875	2,673,952	926	2,193	0,000	\$0,11042	\$ 4,414	96,03%	970	1,000281556	0,027499445	1,2278633	1,16217	266,46204	m1	1,00065	0,99951	2,858		
	Feb-16	62	2,875	0,99913	-	2,875	2,875	2,685,744	934	2,196	0,000	\$0,10622	\$ 4,397	95,95%	972											
	Mar-16	63	2,899	1,00747	-	2,876	2,876	2,376,948	820	0,997	0,259	\$0,10594	\$ 4,374	96,57%	764											
	Apr-16	64	2,896	1,00643	-	2,876	2,876	1,916,551	662	0,522	0,183	\$0,10555	\$ 4,382	96,84%	703											
	May-16	65	2,902	1,00851	-	2,876	2,876	1,969,690	686	0,118	1,239	\$0,10782	\$ 4,370	96,68%	812											
	Jun-16	66	-	-	-	2,877	2,877	-	-	0,000	2,726	\$0,10719	\$ 4,378	96,07%	1,088											
	Jul-16	67	-	-	-	2,880	2,880	-	-	0,000	3,450	\$0,10562	\$ 4,411	95,52%	1,281											
	Aug-16	68	-	-	-	2,877	2,877	-	-	0,000	2,924	\$0,10508	\$ 4,388	96,23%	1,145											
	Sep-16	69	-	-	-	2,878	2,878	-	-	0,009	1,649	\$0,10355	\$ 4,367	96,61%	882											
	Oct-16	70	-	-	-	2,878	2,878	-	-	0,609	0,271	\$0,10315	\$ 4,390	96,66%	733											
	Nov-16	71	-	-	-	2,878	2,878	-	-	1,692	0,011	\$0,10805	\$ 4,382	96,79%	802											
	Dec-16	72	-	-	-	2,879	2,879	-	-	1,943	0,037	\$0,10606	\$ 4,369	96,72%	840											
	Jan-17	73	-	-	-	2,879	2,879	-	-	2,854	0,019	\$0,10533	\$ 4,415	96,15%	975											
	Feb-17	74	-	-	-	2,880	2,873	-	-	2,219	0,000	\$0,10593	\$ 4,398	96,05%	877											
	Mar-17	75	-	-	-	2,880	2,883	-	-	1,456	0,174	\$0,10757	\$ 4,375	96,69%	800											
	Apr-17	76	-	-	-	2,880	2,880	-	-	0,490	0,218	\$0,10686	\$ 4,389	96,96%	703											
	May-17	77	-	-	-	2,881	2,878	-	-	0,118	1,239	\$0,10805	\$ 4,376	96,81%	813											
	Jun-17	78	-	-	-	2,881	2,881	-	-	0,000	2,726	\$0,11045	\$ 4,384	96,20%	1,077											
	Jul-17	79	-	-	-	2,881	2,882	-	-	0,000	3,450	\$0,10634	\$ 4,418	95,64%	1,280											
	Aug-17	80	-	-	-	2,882	2,880	-	-	0,000	2,924	\$0,10579	\$ 4,394	96,36%	1,144											
	Sep-17	81	-	-	-	2,882	2,888	-	-	0,609	0,271	\$0,10385	\$ 4,367	96,73%	793											
	Oct-17	82	-	-	-	2,882	2,888	-	-	1,692	0,011	\$0,10878	\$ 4,388	96,82%	801											
	Nov-17	83	-	-	-	2,883	2,886	-	-	1,943	0,037	\$0,10879	\$ 4,376	96,85%	840											
	Dec-17	84	-	-	-	2,883	2,878	-	-	2,854	0,019	\$0,10605	\$ 4,423	96,15%	983											
	Jan-18	85	-	-	-	2,884	2,874	-	-	2,219	0,000	\$0,10593	\$ 4,435	96,05%	886											
	Feb-18	86	-	-	-	2,884	2,885	-	-	1,456	0,174	\$0,10757	\$ 4,412	96,69%	809											
	Mar-18	87	-	-	-	2,884	2,882	-	-	0,490	0,218	\$0,10686	\$ 4,421	96,96%	709											
	Apr-18	88	-	-	-	2,884	2,885	-	-	0,118	1,239	\$0,10805	\$ 4,409	96,81%	821											
	May-18	89	-	-	-	2,885	2,879	-	-	0,000	2,726	\$0,11045	\$ 4,417	96,20%	1,067											
	Jun-18	90	-	-	-	2,885	2,883	-	-	0,000	3,450	\$0,10634	\$ 4,444	95,64%	1,290											
	Jul-18	91	-	-	-	2,885	2,884	-	-	0,000	2,924	\$0,10579	\$ 4,421	96,36%	1,153											
	Aug-18	92	-	-	-	2,886	2,882	-	-	0,009	1,649	\$0,10425	\$ 4,400	96,73%	888											
	Sep-18	93	-	-	-	2,886	2,890	-	-	0,609	0,271	\$0,10385	\$ 4,417	96,79%	737											
	Oct-18	94	-	-	-	2,886	2,890	-	-	1,692	0,011	\$0,10878	\$ 4,408	96,92%	806											
	Nov-18	95	-	-	-	2,887	2,887	-	-	1,943	0,037	\$0,10879	\$ 4,396	96,85%	844											
	Dec-18	96	-	-	-	2,887	2,880	-	-	2,854	0,019	\$0,10605	\$ 4,423	96,15%	975											
	Jan-19	97	-	-	-	2,887	2,876	-	-	2,219	0,000	\$0,10593	\$ 4,410	96,05%	880											
	Feb-19	98	-	-	-	2,888	2,887	-	-	1,456	0,174	\$0,10757	\$ 4,398	96,69%	805											
	Mar-19	99	-	-	-	2,888	2,884	-	-	0,490	0,218	\$0,10686	\$ 4,426	96,96%	710											
	Apr-19	100	-	-	-	2,888	2,881	-	-	0,118	1,239	\$0,10805	\$ 4,414	96,81%	822											
	May-19	101	-	-	-	2,889	2,885	-	-	0,000	2,726	\$0,11045	\$ 4,402	96,20%	1,082											
	Jun-19	102	-	-	-	2,889	2,886	-	-	0,000	3,450	\$0,10634	\$ 4,430	95,64%	1,285											
	Jul-19	103	-	-	-	2,890	2,886	-	-	0,000	2,924	\$0,10579	\$ 4,418	96,36%	1,152											
	Aug-19	104	-	-	-	2,890	2,894	-	-	0,009	1,649	\$0,10425	\$ 4,406	96,73%	890											
	Sep-19	105	-	-	-	2,891	2,891	-	-	0,609	0,271	\$0,10385	\$ 4,435	96,79%	741											
	Oct-19	106	-	-	-	2,891	2,892	-	-	1,692	0,011	\$0,10878	\$ 4,423	96,82%	809											
	Nov-19	107	-	-	-	2,891	2,890	-	-	1,943	0,037	\$0,10879	\$ 4,411	96,85%	848											
	Dec-19	108	-	-	-	2,892	2,892	-	-	2,854	0,019	\$0,10605	\$ 4,439	96,15%	979											
	Jan-20	109	-	-	-	2,892	2,878	-	-	2,219	0,000	\$0,10593	\$ 4,427	96,05%	884											
	Feb-20	110	-	-	-	2,892	2,878	-	-	1,456	0,174	\$0,10757	\$ 4,415	96,69%	809											
	Mar-20	111	-	-	-	2,892	2,889	-	-	0,490	0,218	\$0,10686	\$ 4,445	96,96%	714											
	Apr-20	112	-	-	-	2,893	2,886	-	-	0,118	1,239	\$0,10805	\$ 4,432	96,81%	826											
	May-20	113	-	-	-	2,893	2,883	-	-	0,000	2,726	\$0,11045	\$ 4,420	96,20%	1,088											
	Jun-20	114	-	-	-	2,893	2,887	-	-	0,000	3,450	\$0,10634	\$ 4,451	95,64%	1,293											
	Jul-20	115	-	-	-	2,894	2,888	-	-	0,000	2,924	\$0,10579	\$ 4,439	96,36%	1,159											
	Aug-20	116	-	-	-	2,894	2,896	-	-	0,009	1,649	\$0,10425	\$ 4,427	96,73%	746											
	Sep-20	117	-	-	-	2,894	2,893	-	-	0,609	0,271	\$0,10385	\$ 4,459	96,79%	895											
	Oct-20	118	-	-	-	2,895	2,893	-	-	1,692	0,011	\$0,10878	\$ 4,447	96,92%	746											
	Nov-20	119	-	-	-	2,895	2,891	-	-	1,943	0,037	\$0,10879	\$ 4,435	96,85%	815											
	Dec-20	120	-	-	-	2,895	2,883	-	-	2,854	0,019	\$0,10605	\$ 4,461	96,15%	854											

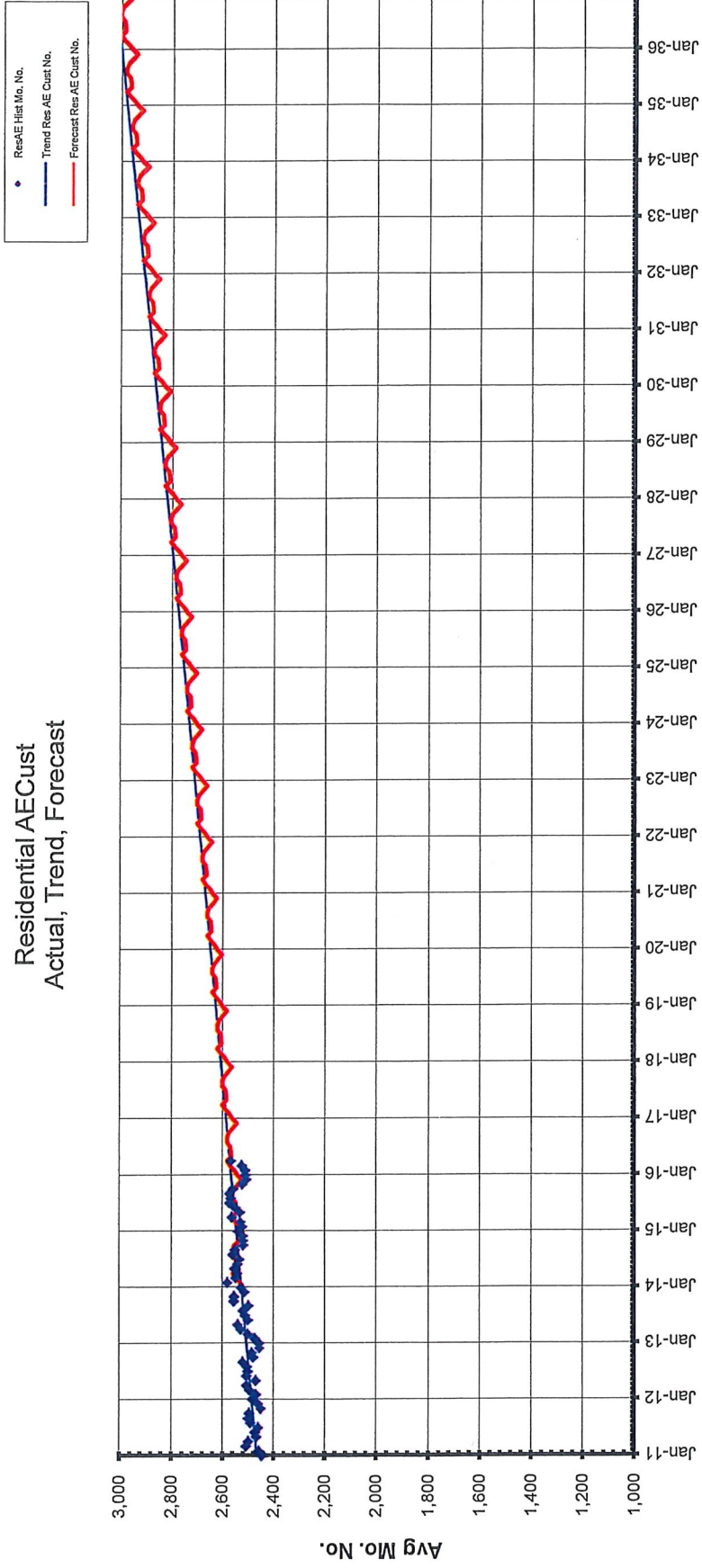
Residential Cust Actual, Trend, Forecast



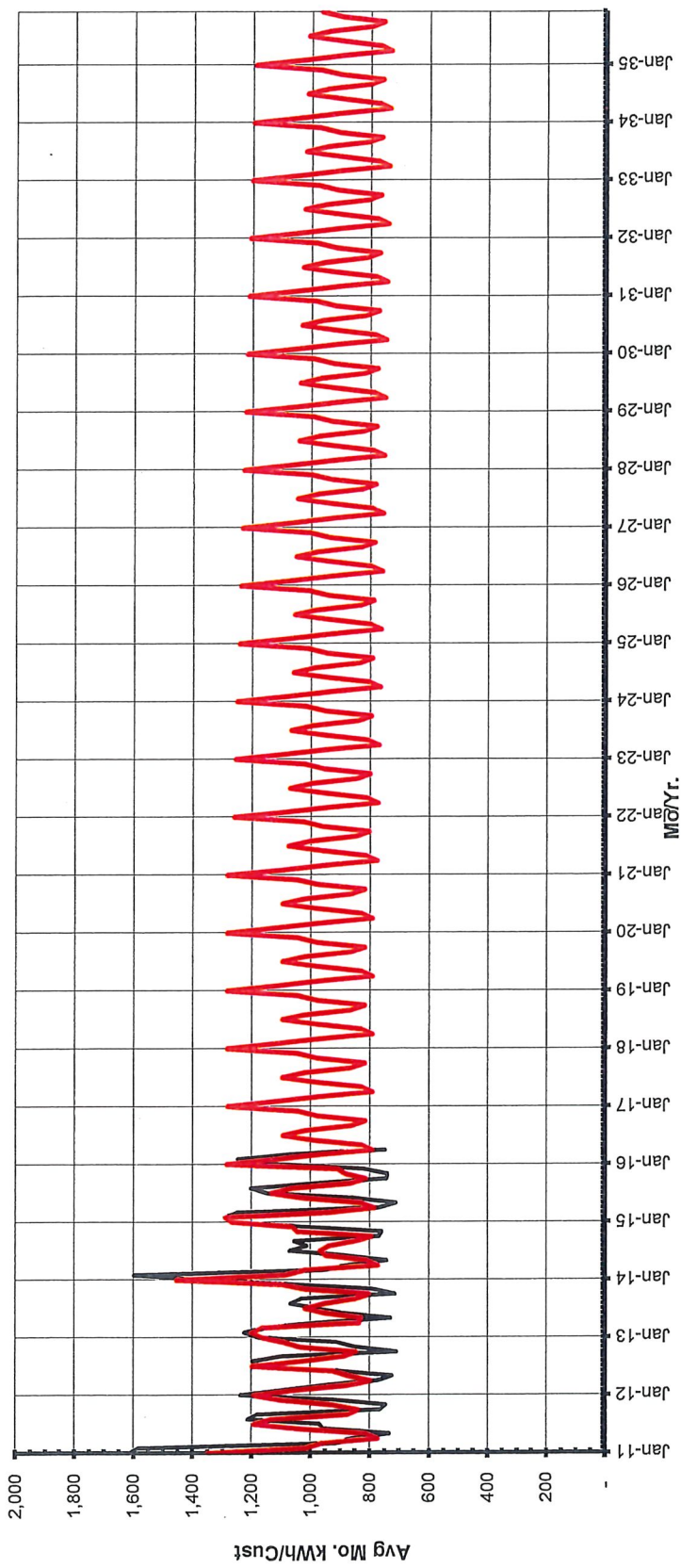
Residential Cust Avg Mo. kWh/Cust Actual, Trend



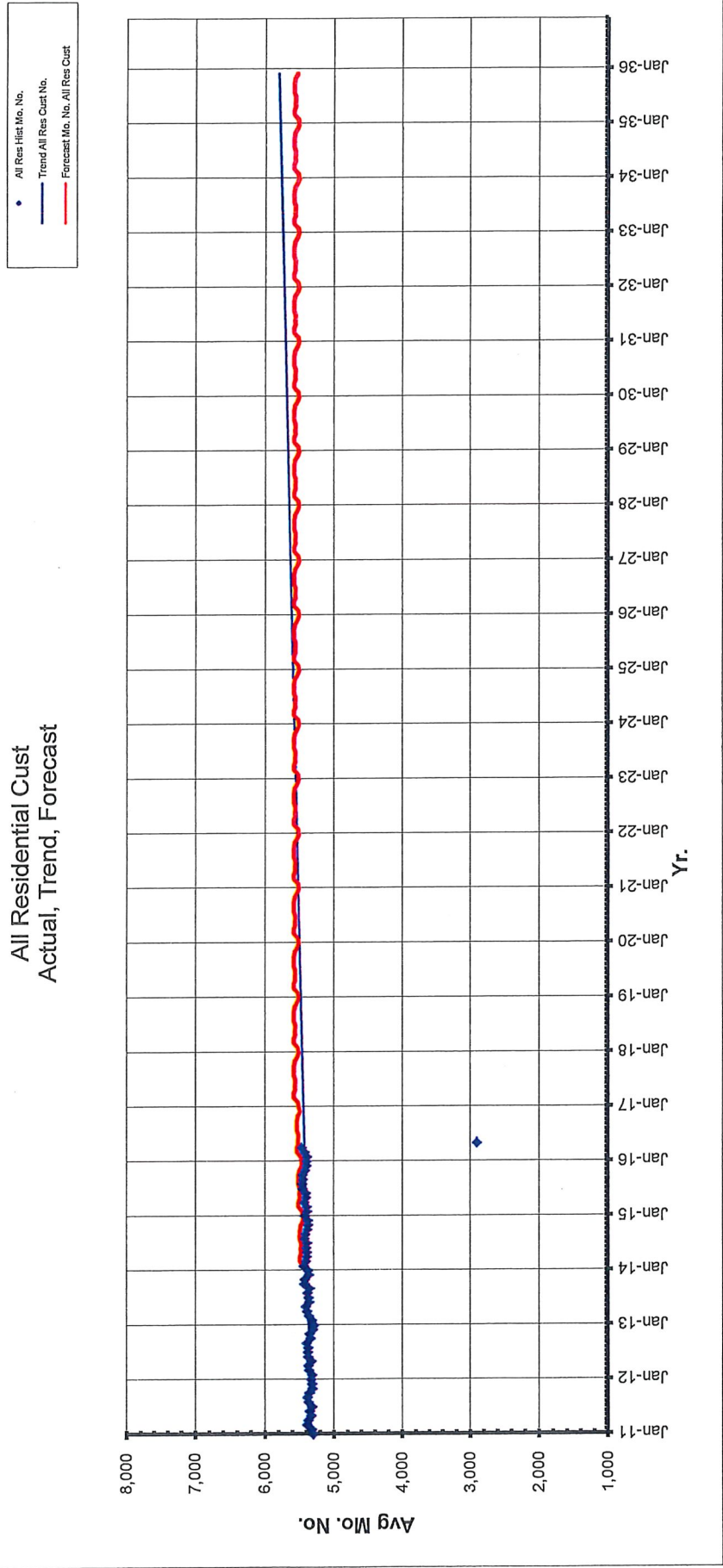
Residential AECust Actual, Trend, Forecast



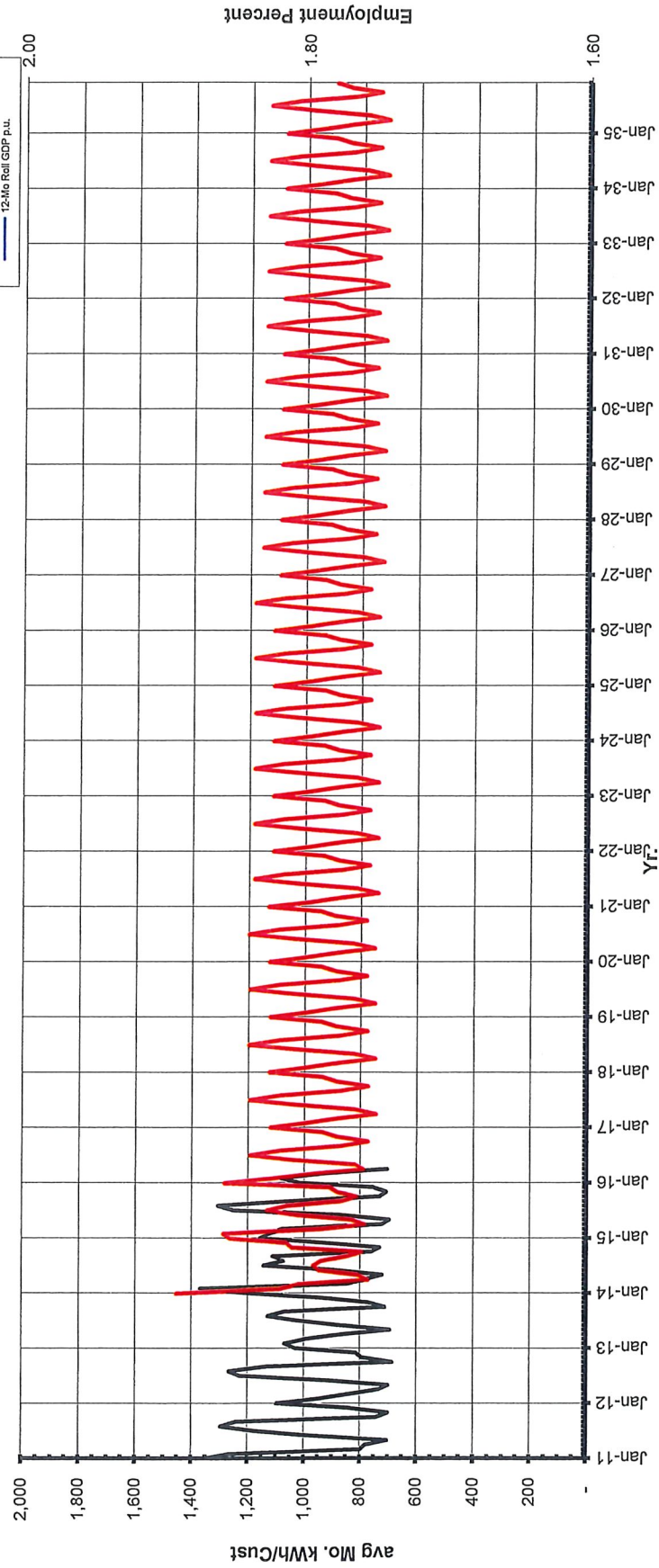
AE Residential Cust Avg Mo. kWh/Cust Actual, Trend



All Residential Cust Actual, Trend, Forecast



ALL Residential Cust Avg Mo. kWh/Cust Actual, Trend



TOTAL SYSTEM ACTUAL AND FORECAST LOADS

Mo/Yr	Res	Res AE	Com Dm	Com Dm AE	Com non Dm	Com Lg	Hospital	L&W Dm	L&W non Dm	City Dm	City non Dm	City Traf Lt	City St Lt	Security Lts
Jan-11	3,202,128	3,956,006	3,166,742	549,614	1,143,577	172,000	871,200	318,549	10,196	51,155	10,937	3,437	155,474	165,755
Feb-11	2,854,100	3,866,706	3,209,668	572,278	1,015,106	178,800	868,800	313,688	9,955	39,887	7,981	2,921	120,485	139,733
Mar-11	2,010,950	2,294,275	2,984,752	449,240	777,533	186,800	846,400	343,029	6,516	34,029	6,844	2,882	112,596	143,654
Apr-11	2,059,771	1,805,909	2,984,752	449,240	777,533	186,800	846,400	343,029	6,516	34,029	6,844	2,882	112,596	143,654
May-11	1,934,791	1,809,732	3,197,576	483,638	882,638	184,800	1,042,800	296,767	1,537	40,900	12,347	3,278	105,962	121,954
Jun-11	2,872,422	2,370,086	3,911,602	575,620	1,101,136	214,800	1,190,400	296,767	1,537	40,900	12,347	3,278	105,962	121,954
Jul-11	3,852,782	2,366,158	3,904,641	591,968	1,235,896	214,800	1,360,000	139,136	2,114	55,842	14,899	3,219	97,023	99,453
Aug-11	3,944,798	3,017,787	4,607,739	691,531	1,269,033	230,800	1,464,000	194,521	2,154	57,467	14,905	3,259	123,502	106,939
Sep-11	3,728,175	2,955,001	4,171,260	629,538	1,254,145	208,800	1,095,600	136,688	1,959	42,876	10,605	2,983	110,697	121,554
Oct-11	2,060,989	1,911,313	4,171,260	629,538	1,254,145	181,600	965,200	136,688	1,959	42,876	10,605	2,983	110,697	121,554
Nov-11	1,888,224	1,828,763	3,000,898	453,988	763,974	173,200	965,200	136,688	2,461	37,776	8,071	3,196	136,589	128,327
Dec-11	2,195,419	2,269,510	2,744,751	429,982	783,732	165,200	936,400	284,050	4,599	36,438	8,536	2,904	130,588	154,705
Jan-12	2,765,466	3,071,473	3,109,629	500,574	990,081	171,200	950,000	182,059	6,697	40,563	7,981	3,542	154,488	165,755
Feb-12	2,333,502	2,688,165	3,068,326	488,994	827,768	172,800	934,000	186,061	7,294	39,887	6,584	2,962	120,907	139,733
Mar-12	2,120,783	2,574,031	433,204	774,420	1,071,200	164,800	929,600	163,592	6,013	36,152	6,687	2,862	115,797	143,654
Apr-12	1,999,317	1,938,360	3,228,643	472,953	856,242	178,800	1,071,200	155,253	2,235	42,476	9,741	3,504	123,885	128,327
May-12	1,932,995	1,788,109	3,336,250	478,711	821,045	178,800	1,067,200	159,578	1,670	45,597	9,622	2,690	96,560	121,554
Jun-12	1,834,448	1,720,317	3,775,200	545,118	891,963	192,400	1,148,000	125,347	1,568	53,185	12,404	2,921	93,667	106,939
Jul-12	3,677,218	2,918,595	4,079,144	596,970	1,240,435	209,200	1,245,600	142,925	1,911	61,949	12,835	3,010	98,978	99,453
Aug-12	3,609,492	2,998,151	4,277,591	637,858	1,157,391	222,000	1,305,200	137,391	1,849	64,440	13,120	2,987	97,099	99,453
Sep-12	3,354,007	2,768,116	4,155,405	577,530	1,125,639	216,400	1,305,200	123,050	1,813	56,254	14,634	2,597	125,438	106,939
Oct-12	1,987,723	1,759,396	3,388,953	481,118	750,899	185,600	1,095,600	123,050	1,813	56,254	14,634	2,597	125,438	106,939
Nov-12	2,123,890	2,114,057	4,622,912	879,847	1,022,400	169,800	1,022,400	322,096	3,762	41,306	10,161	3,204	169,471	128,327
Dec-12	2,075,498	2,247,144	2,873,450	435,479	705,350	162,000	462,400	267,125	5,369	36,612	8,449	2,458	108,381	154,705
Jan-13	2,857,429	2,865,559	3,140,468	488,117	881,927	176,000	474,000	314,839	5,364	39,072	7,321	2,980	165,755	165,755
Feb-13	2,651,905	3,030,753	3,215,236	491,161	880,308	171,600	562,800	256,854	7,464	40,930	7,423	2,731	126,492	139,733
Mar-13	2,442,392	2,879,271	2,909,567	440,305	827,000	153,200	794,400	260,083	7,542	38,143	6,496	2,569	113,280	143,654
Apr-13	2,169,676	2,464,702	3,098,764	471,717	790,486	166,000	936,800	288,002	6,967	38,606	7,927	2,697	106,176	128,327
May-13	1,892,295	1,852,453	3,119,785	459,381	828,407	166,000	984,000	288,002	6,967	38,606	7,927	2,697	106,176	128,327
Jun-13	2,493,347	2,234,694	3,784,212	526,582	983,413	192,000	1,123,600	305,532	1,798	52,512	11,069	2,899	113,826	121,554
Jul-13	3,042,143	2,464,037	3,915,366	559,086	1,065,505	201,200	1,167,200	305,532	1,845	52,512	11,069	2,899	113,826	121,554
Aug-13	3,976,606	2,890,361	4,132,131	576,425	1,110,775	198,000	1,246,400	306,545	1,945	55,539	11,571	2,833	97,793	99,453
Sep-13	3,144,907	2,676,534	4,172,943	560,257	1,103,391	198,000	1,140,000	317,061	2,021	57,845	13,268	3,110	125,257	106,939
Oct-13	2,040,524	1,823,132	3,654,148	485,381	842,424	177,200	1,024,000	273,571	1,217	45,812	8,988	2,591	111,927	121,554
Nov-13	2,156,543	2,021,458	3,156,445	423,651	767,054	172,000	947,200	228,783	2,135	39,588	9,611	2,824	135,861	128,327
Dec-13	2,390,621	2,853,929	3,234,639	463,199	832,489	164,000	846,800	225,389	6,047	41,650	11,151	2,723	128,306	154,705
Jan-14	3,016,625	3,463,555	3,195,116	480,923	1,004,606	164,000	841,200	256,272	8,771	46,696	10,526	2,940	163,778	165,755
Feb-14	3,315,363	4,123,982	3,470,005	542,015	1,102,782	163,200	887,600	257,854	9,224	50,548	10,508	2,966	106,347	139,733
Mar-14	2,136,093	2,442,081	2,948,645	425,434	716,378	152,400	871,200	246,354	5,326	38,059	8,006	2,341	107,300	143,654
Apr-14	2,014,746	2,205,786	3,134,914	432,741	757,157	170,000	949,600	212,173	6,022	38,946	7,479	2,832	111,769	128,327
May-14	1,996,675	1,695,441	3,292,281	450,450	789,163	174,400	1,012,000	219,915	2,303	43,000	8,656	2,802	74,078	121,554
Jun-14	2,951,961	2,295,549	4,063,726	525,245	1,079,319	202,210	1,150,553	182,928	1,905	53,855	11,292	2,906	82,489	106,939
Jul-14	3,447,752	2,713,471	4,220,190	531,183	1,065,505	206,493	1,163,487	182,161	1,903	56,200	11,355	3,254	87,411	99,453
Aug-14	3,226,779	2,590,079	4,149,156	524,537	1,110,775	203,606	1,142,251	185,217	1,911	54,610	11,017	3,071	90,321	99,453
Sep-14	3,325,167	2,688,363	3,824,621	473,548	1,103,381	193,461	1,091,368	193,877	1,943	48,687	9,380	3,224	106,939	106,939
Oct-14	2,147,937	1,946,607	4,278,305	427,873	1,103,381	181,302	956,103	142,424	2,558	41,143	7,710	2,848	121,554	121,554
Nov-14	2,012,475	1,910,493	3,311,094	428,241	787,054	170,600	793,326	248,071	5,671	41,143	7,348	3,277	128,327	128,327
Dec-14	2,415,960	2,604,505	3,364,723	448,491	832,489	171,600	786,801	248,932	5,904	41,255	7,350	2,860	109,985	154,705
Jan-15	3,057,728	3,208,608	3,470,602	462,455	1,004,606	169,480	729,956	312,502	8,438	42,254	8,317	3,369	141,004	165,755
Feb-15	2,776,260	3,258,966	3,347,488	464,362	1,102,782	167,162	730,271	312,611	8,585	42,266	8,318	2,965	106,642	139,733
Mar-15	2,644,302	3,163,341	3,412,402	447,001	716,378	173,800	866,300	284,440	3,986	40,819	8,424	2,851	104,132	143,654
Apr-15	1,957,806	1,970,381	3,613,310	438,428	757,157	183,307	954,638	289,937	2,466	40,428	3,068	3,068	90,475	128,327
May-15	1,957,424	1,800,650	3,947,341	484,345	789,163	194,561	1,072,585	242,806	2,024	46,791	10,135	3,119	121,554	121,554
Jun-15	2,542,252	2,182,713	4,454,486	550,006	1,079,319	212,529	1,203,863	212,979	1,893	56,313	11,805	3,059	82,489	106,939
Jul-15	3,891,068	2,950,067	4,787,652	592,054	1,105,565	212,964	1,257,730	203,275	1,871	63,231	12,855	3,254	87,411	99,453
Aug-15	4,057,298	3,086,384	4,573,311	557,664	1,084,330	214,645	1,209,020	212,477	1,892	58,552	11,856	3,071	90,321	99,453
Sep-15	3,129,099	2,599,366	4,976,100	476,100	1,067,614	196,614	1,103,866	238,258	1,947	47,983	9,239	3,224	100,775	106,939
Oct-15	2,086,001	1,903,622	3,114,869	482,604	822,604	162,921	941,564	273,662	2,759	40,440	7,557	2,848	121,554	121,554
Nov-15	1,960,592	1,866,657	3,050,373	407,139	868,725	158,613	872,351	284,308	3,695	40,262	7,385	3,277	128,113	128,327
Dec-15	2,007,627	2,061,567	3,101,331	428,786	887,865	159,864	869,391	283,328	3,837	40,876	7,483	2,860	109,985	154,705

TOTAL SYSTEM ACTUAL AND FORECAST LOADS

Mo/Yr	Res	Res AE	Com Dm	Com Dm AE	Com non Dm	Com Lg	Hospital	L&W Dm	L&W non Dm	City Dm	City non Dm	CityTraf Lg	CitySt Lt	Security Lts
Jan-16	2,673,962	2,817,656	3,440,349	463,891	947,759	167,332	724,817	312,112	8,802	42,374	8,319	3,369	141,004	165,755
Feb-16	2,685,744	2,868,845	3,466,845	456,406	944,908	170,230	783,731	302,228	6,053	41,324	8,301	2,955	106,642	139,733
Mar-16	2,376,948	2,707,959	3,507,923	449,713	846,735	174,494	832,866	283,113	4,131	41,242	8,488	2,851	104,132	143,654
Apr-16	1,922,080	1,916,551	3,635,145	435,402	823,453	181,293	933,014	270,742	2,555	40,176	8,518	3,068	90,475	128,327
May-16	1,989,690	3,971,020	3,971,020	475,048	930,321	192,307	1,039,668	246,213	2,081	45,521	9,831	3,119	92,156	121,554
Jun-16	3,132,676	2,697,103	4,450,790	591,617	1,161,976	209,203	1,151,744	218,343	1,908	55,376	11,180	3,059	82,499	106,939
Jul-16	3,690,610	2,808,752	4,752,663	597,312	1,278,741	220,560	1,179,554	206,435	1,881	61,041	12,387	3,254	87,411	99,453
Aug-16	3,306,527	2,690,025	4,500,343	543,997	1,164,871	212,496	1,136,288	215,017	1,900	56,872	11,498	3,071	90,321	99,453
Sep-16	2,546,305	2,291,836	4,008,659	473,415	959,706	197,150	1,053,782	237,416	1,957	47,929	9,223	3,224	100,775	106,939
Oct-16	2,116,695	2,102,650	3,598,148	427,211	762,067	181,944	788,469	271,010	2,707	40,664	7,602	2,848	94,191	121,554
Nov-16	2,312,541	2,496,803	3,418,706	423,576	765,341	172,536	798,765	289,625	4,660	40,664	7,350	3,277	128,113	128,327
Dec-16	2,416,244	2,657,934	3,395,508	444,522	789,534	170,332	787,167	292,152	5,274	41,148	7,383	2,860	109,985	154,705
Jan-17	2,801,014	3,282,512	3,461,120	462,900	948,475	168,595	710,988	308,570	8,295	42,315	8,339	3,369	141,004	165,755
Feb-17	2,518,143	2,884,773	3,554,511	455,705	900,330	170,478	771,446	300,758	6,053	41,324	8,301	2,955	106,642	139,733
Mar-17	2,306,961	2,510,517	3,588,788	451,224	859,675	174,613	880,664	281,735	4,131	41,242	8,488	2,851	104,132	143,654
Apr-17	2,024,628	2,086,886	3,740,539	437,228	813,100	181,837	930,705	269,425	2,555	40,176	8,518	3,068	90,475	128,327
May-17	2,340,162	2,143,906	4,084,808	477,047	904,470	192,862	1,037,177	245,015	2,081	45,521	9,831	3,119	92,156	121,554
Jun-17	3,103,689	2,524,503	4,580,135	533,859	1,099,988	209,691	1,148,904	217,281	1,908	55,376	11,180	3,059	82,499	106,939
Jul-17	3,690,487	2,835,343	4,988,348	569,738	1,238,231	221,227	1,176,246	205,431	1,881	61,041	12,387	3,254	87,411	99,453
Aug-17	3,306,428	2,654,908	4,744,834	546,318	1,144,930	213,175	1,133,050	213,971	1,900	56,872	11,498	3,071	90,321	99,453
Sep-17	2,546,301	2,252,869	4,224,340	475,440	957,493	197,777	1,050,884	286,261	1,957	47,929	9,223	3,224	100,775	106,939
Oct-17	2,116,573	2,122,454	3,790,315	429,024	829,402	182,504	788,504	269,692	2,707	40,664	7,602	2,848	94,191	121,554
Nov-17	2,312,124	2,502,577	3,603,723	425,363	848,903	173,066	796,563	288,215	4,660	40,664	7,350	3,277	128,113	128,327
Dec-17	2,415,913	2,683,109	3,577,992	446,383	873,883	170,853	785,071	290,730	5,274	41,148	7,383	2,860	109,985	154,705
Jan-18	2,825,154	3,313,357	3,716,176	467,186	945,683	171,462	708,998	307,068	8,295	42,315	8,339	3,369	141,004	165,755
Feb-18	2,546,283	2,906,623	3,724,477	459,911	900,410	173,364	789,507	299,294	6,053	41,324	8,301	2,955	106,642	139,733
Mar-18	2,332,632	2,529,533	3,770,441	455,369	863,308	177,553	828,405	280,364	4,131	41,242	8,488	2,851	104,132	143,654
Apr-18	2,044,490	2,072,474	3,908,995	440,912	817,995	184,520	928,367	268,114	2,555	40,176	8,518	3,068	90,475	128,327
May-18	2,963,059	2,160,154	4,267,887	481,069	909,918	195,719	1,034,656	243,822	2,081	45,521	9,831	3,119	92,156	121,554
Jun-18	3,194,110	2,543,635	4,765,581	538,368	1,106,592	212,924	1,146,027	216,223	1,908	55,376	11,180	3,059	82,499	106,939
Jul-18	3,720,619	2,896,844	5,194,527	574,008	1,245,945	223,914	1,172,866	204,431	1,881	61,041	12,387	3,254	87,411	99,453
Aug-18	3,393,291	2,675,041	4,940,589	550,388	1,162,030	215,752	1,129,692	212,930	1,900	56,872	11,498	3,071	90,321	99,453
Sep-18	2,566,901	2,289,954	4,386,263	478,989	963,425	200,155	1,047,951	265,379	1,957	47,929	9,223	3,224	100,775	106,939
Oct-18	2,130,217	2,138,560	3,932,977	431,823	834,479	184,221	907,450	268,379	2,707	40,664	7,602	2,848	94,191	121,554
Nov-18	2,327,001	2,539,705	3,739,271	428,126	854,046	174,692	794,294	286,813	4,660	40,664	7,350	3,277	128,113	128,327
Dec-18	2,431,419	2,703,470	3,712,448	449,285	879,205	172,452	782,951	289,315	5,274	41,148	7,383	2,860	109,985	154,705
Jan-19	2,803,367	3,338,644	3,743,942	466,416	961,566	169,228	706,984	305,574	8,295	42,315	8,339	3,369	141,004	165,755
Feb-19	2,530,302	2,915,873	3,763,618	459,533	915,527	171,494	767,544	297,838	6,053	41,324	8,301	2,955	106,642	139,733
Mar-19	2,325,183	2,546,803	3,834,722	455,800	877,717	176,504	828,118	275,000	4,131	41,242	8,488	2,851	104,132	143,654
Apr-19	2,048,764	2,088,228	4,019,039	442,668	830,300	184,976	926,000	266,809	2,555	40,176	8,518	3,068	90,475	128,327
May-19	2,968,082	2,176,574	4,389,027	483,003	923,586	196,213	1,032,103	242,636	2,081	45,521	9,831	3,119	92,156	121,554
Jun-19	3,122,804	2,563,016	4,862,960	538,758	1,123,210	211,528	1,143,115	215,171	1,908	55,376	11,180	3,059	82,499	106,939
Jul-19	3,708,332	2,878,609	5,281,885	574,518	1,262,213	222,556	1,169,509	203,436	1,881	61,041	12,387	3,254	87,411	99,453
Aug-19	3,332,885	2,695,394	5,057,069	551,989	1,166,998	215,592	1,126,435	211,894	1,900	56,872	11,498	3,071	90,321	99,453
Sep-19	2,572,443	2,287,209	4,523,415	480,928	975,904	200,675	1,044,983	233,967	1,957	47,929	9,223	3,224	100,775	106,939
Oct-19	2,142,375	2,154,794	4,074,771	434,463	843,589	185,738	900,894	265,073	2,707	40,664	7,602	2,848	94,191	121,554
Nov-19	2,336,042	2,566,990	3,866,368	430,468	863,305	175,863	792,008	285,417	4,660	40,664	7,350	3,277	128,113	128,327
Dec-19	2,442,928	2,723,999	3,838,542	451,757	888,755	173,604	780,604	287,907	5,274	41,148	7,383	2,860	109,985	154,705
Jan-20	2,818,395	3,376,139	3,876,139	469,168	955,034	170,528	704,945	304,087	8,295	42,315	8,339	3,369	141,004	165,755
Feb-20	2,543,833	2,951,028	3,896,404	462,229	910,919	172,805	765,556	296,388	6,053	41,324	8,301	2,955	106,642	139,733
Mar-20	2,337,587	2,568,153	3,969,910	458,465	876,628	177,850	823,603	277,642	4,131	41,242	8,488	2,851	104,132	143,654
Apr-20	2,060,918	2,104,078	4,165,875	445,405	834,696	186,564	923,603	265,511	2,555	40,176	8,518	3,068	90,475	128,327
May-20	2,982,085	2,193,065	4,549,242	485,984	928,526	197,891	1,029,518	241,455	2,081	45,521	9,831	3,119	92,156	121,554
Jun-20	3,141,237	2,982,065	5,040,323	542,098	1,121,202	219,333	1,140,167	214,124	1,908	55,376	11,180	3,059	82,499	106,939
Jul-20	3,732,650	2,900,452	5,481,952	578,284	1,260,528	224,691	1,166,079	202,446	1,881	61,041	12,387	3,254	87,411	99,453
Aug-20	3,354,686	2,715,848	5,248,442	555,505	1,170,203	217,595	1,123,068	210,863	1,900	56,872	11,498	3,071	90,321	99,453
Sep-20	2,589,227	2,304,565	4,694,435	484,077	981,202	202,590	1,041,978	232,629	1,957	47,929	9,223	3,224	100,775	106,939
Oct-20	2,171,139	2,171,139	4,236,903	437,531	851,894	181,783	898,308	265,774	2,707	40,664	7,602	2,848	94,191	121,554
Nov-20	2,355,410	2,578,402	4,020,050	433,522	870,719	177,965	789,695	284,028	4,660	40,664	7,350	3,277	128,113	128,327
Dec-20	2,461,029	2,744,662	3,990,963	454,933	896,409	175,504	778,631	286,506	5,274	41,148	7,383	2,860	109,985	154,705

TOTAL SYSTEM ACTUAL AND FORECAST LOADS

Mo/Yr	Subtotal	Losses	% Losses 7.30% of Total	Mo. Losses % of Total	Ann. Losses	Total Act kWh	Total Ann. Total	Tot. Mo. L.F.	Act NCP - kW	Avg Mo. P.F. - p.u.	Total Forecast kWh	Forecasted NCP - kW
Jan-11	13,763,770	805,561	5.9%			14,569,331	66.1%	29,841	0.91887			
Feb-11	13,234,902	(2,026,350)	-18.1%			11,208,553	64.1%	26,015	0.91132			
Mar-11	1,291,002	237,770	2.3%			10,970,783	70.2%	21,263	0.89789			
Apr-11	10,318,047	2,479,315	19.7%			10,555,817	67.1%	21,855	0.88359			
May-11	10,107,880	2,549,661	16.7%			12,587,195	52.6%	32,194	0.87596			
Jun-11	12,692,241	3,256,175	19.0%			15,241,902	62.4%	33,951	0.86621			
Jul-11	13,890,685	1,430,488	8.4%			17,146,860	67.0%	34,414	0.86522			
Aug-11	15,534,822	(2,059,734)	-16.3%			16,965,310	64.7%	35,240	0.86644			
Sep-11	14,696,326	278,732	2.6%			12,686,592	53.4%	32,886	0.87404			
Oct-11	10,372,197	1,167,111	10.8%	7.4%		10,650,929	72.1%	19,853	0.89310			
Nov-11	9,607,104	2,053,391	16.8%	16.8%	11,463,122	12,199,985	69.8%	22,042	0.90559			
Dec-11	10,146,594	824,812	6.4%			12,945,141	61.2%	23,498	0.911224			
Jan-12	12,120,528	379,302	3.3%			11,396,174	62.0%	26,431	0.91221			
Feb-12	11,016,872	892,803	8.1%			11,020,277	66.0%	22,435	0.89201			
Mar-12	10,127,474	319,925	3.0%			10,530,871	59.5%	24,556	0.89047			
Apr-12	10,210,946	3,072,130	23.4%			13,113,309	62.4%	28,224	0.87705			
May-12	11,993,477	1,884,177	13.6%			13,877,654	55.9%	34,451	0.87160			
Jun-12	14,387,823	2,785,660	16.2%			17,173,483	66.7%	34,631	0.86799			
Jul-12	14,821,801	351,438	2.3%			15,173,239	62.2%	32,810	0.87029			
Aug-12	13,823,422	(1,100,007)	-8.6%			12,723,415	60.0%	29,457	0.87628			
Sep-12	9,970,473	974,976	8.9%			10,945,448	67.6%	21,748	0.89152			
Oct-12	10,483,267	803,753	7.1%	9.1%		11,287,020	70.4%	22,279	0.91489			
Nov-12	9,544,418	2,667,745	22.0%	13.8%	13,876,514	12,232,163	72.2%	22,773	0.91421			
Dec-12	11,288,042	1,587,961	12.3%			12,876,003	67.0%	25,827	0.90981			
Jan-13	11,605,410	472,072	3.9%			12,077,483	69.7%	25,779	0.91414			
Feb-13	11,017,895	1,489,967	11.9%			12,507,863	65.5%	25,666	0.91128			
Mar-13	10,627,625	(2,404,987)	-2.3%			10,387,127	66.4%	21,728	0.88907			
Apr-13	9,874,952	1,842,083	15.7%			11,717,044	60.1%	26,205	0.86092			
May-13	11,910,875	2,121,025	15.1%			14,031,900	62.2%	31,354	0.86935			
Jun-13	12,969,445	1,837,214	12.4%			14,826,659	63.7%	31,272	0.86313			
Jul-13	13,913,888	572,647	4.0%			14,486,535	61.8%	31,501	0.86519			
Aug-13	13,913,888	(860,676)	-2.9%			13,140,847	61.9%	29,463	0.87257			
Sep-13	13,521,523	652,318	5.8%			11,264,787	64.1%	23,618	0.86930			
Oct-13	10,612,469	1,463,360	12.5%	8.6%		11,875,209	66.1%	24,548	0.90945			
Nov-13	10,211,850	1,710,545	13.3%	13.1%	13,128,019	12,866,002	67.1%	25,791	0.91289			
Dec-13	11,155,458	3,139,548	19.7%			15,950,552	58.3%	36,414	0.92217			
Jan-14	12,811,203	(2,403,207)	-20.4%			11,778,920	64.0%	27,374	0.91477			
Feb-14	14,182,127	1,645,477	13.8%			11,888,748	66.4%	24,054	0.91052			
Mar-14	10,243,271	263,204	2.5%			10,435,716	69.5%	20,859	0.89227			
Apr-14	10,172,512	2,471,944	19.7%			12,554,661	60.3%	27,984	0.88139			
May-14	10,062,718	2,403,643	16.4%			14,696,420	65.6%	31,078	0.87370			
Jun-14	12,282,776	1,280,826	8.5%			15,070,665	62.8%	32,279	0.87427			
Jul-14	13,789,839	1,588,518	10.6%			14,881,303	63.0%	31,969	0.87581			
Aug-14	13,392,785	1,295,554	10.6%			13,296,307	58.1%	31,784	0.87675			
Sep-14	13,168,753	697,112	6.2%			11,185,752	61.6%	24,425	0.88801			
Oct-14	10,488,639	2,048,374	17.0%	9.4%		12,029,607	58.6%	28,493	0.91251			
Nov-14	9,981,233	1,450,676	11.5%	14.7%	15,669	12,646,343	67.1%	25,322	0.91303			
Dec-14	11,195,667	1,474,414	10.4%			14,199,487	56.2%	33,945	0.91791			
Jan-15	12,725,083	1,154,646	8.5%			13,623,187	59.4%	34,129	0.92013			
Feb-15	12,468,541	(578,393)	-5.1%			11,433,426	69.3%	22,182	0.90430			
Mar-15	12,011,819	319,643	3.0%			10,737,964	65.7%	22,713	0.88809			
Apr-15	10,418,321	2,359,131	18.0%			13,123,804	61.4%	28,744	0.87732			
May-15	10,764,673	2,811,674	18.1%			15,514,348	62.9%	34,273	0.87374			
Jun-15	12,702,674	1,557,386	9.3%			16,814,936	65.6%	34,475	0.86766			
Jul-15	15,257,451	539,528	3.4%			15,779,804	61.0%	34,792	0.86774			
Aug-15	15,240,275	41,741	0.3%			12,939,729	57.8%	31,118	0.87611			
Sep-15	12,897,988	1,018,680	9.3%			11,005,654	66.2%	22,914	0.88497			
Oct-15	9,986,975	1,148,661	10.5%	8.5%		10,928,669	66.2%	22,914	0.91251			
Nov-15	9,780,008	1,565,486	13.4%	13.4%	13,412,596	11,684,992	70.2%	22,365	0.91303			
Dec-15	10,119,506				157,785,910							

TOTAL SYSTEM ACTUAL AND FORECAST LOADS

Mo/Yr	Subtotal	% Losses		Ann. Losses	Total Act kWh	Total Ann. Total	Tot. Mo. L.F.	Act NCP - kW	Avg Mo. P.F. - p.u.	Total Forecast kWh	Forecasted NCP - kW
		Mo. Losses	% of Total								
Jan-16	11,917,500	2,816,088	19.1%	14,735,589	14,735,589	28,782	66.8%	28,782	0.91565	14,729,679	33,107
Feb-16	12,245,640	978,468	7.4%	13,224,108	13,224,108	28,538	66.6%	28,538	0.91267	16,127,629	33,282
Mar-16	11,484,279	246,869	2.1%	11,731,148	11,731,148	22,081	71.4%	22,081	0.89734	15,094,597	32,449
Apr-16	10,389,799	1,139,714	9.9%	11,529,512	11,529,512	25,259	63.4%	25,259	0.88745	12,921,591	30,818
May-16	9,118,529	3,881,574	29.9%	13,000,103	13,000,103	28,416	61.5%	28,416	0.88556	11,475,426	23,058
Jun-16	13,654,412	1,075,267	7.3%	14,729,679	158,103,823	33,107	61.8%	33,107		11,855,775	25,010
Jul-16	14,950,312	1,177,317	7.3%	16,127,629		33,282	65.1%	33,282		12,162,618	23,596
Aug-16	13,982,691	1,101,906	7.3%	15,094,597		32,449	65.2%	32,449		13,498,652	28,788
Sep-16	11,978,315	943,276	7.3%	12,921,591		30,818	58.2%	30,818		12,795,202	29,612
Oct-16	10,637,720	837,706	7.3%	11,475,426		23,058	66.9%	23,058		12,210,027	29,612
Nov-16	10,990,303	865,472	10.1%	11,855,775		25,010	65.9%	25,010		11,572,239	24,633
Dec-16	11,274,747	887,871	7.3%	15,953,527	158,587,775	23,596	69.3%	23,596	33,282	12,621,066	28,410
Jan-17	12,513,250	985,402	7.3%	13,498,652		28,788	63.0%	28,788		14,756,364	33,167
Feb-17	11,861,152	934,050	7.3%	12,795,202		29,612	64.3%	29,612		16,386,706	33,816
Mar-17	11,318,685	891,332	7.3%	12,210,027		24,085	68.1%	24,085		15,340,593	32,977
Apr-17	10,127,465	844,773	7.3%	11,572,239		24,633	65.2%	24,633		13,173,043	31,418
May-17	11,699,728	921,338	7.3%	12,621,066		28,410	59.7%	28,410		12,169,273	23,660
Jun-17	13,679,150	1,077,215	7.3%	14,756,364	157,091,186	33,167	61.8%	33,167		12,476,050	24,204
Jul-17	15,190,476	1,196,230	7.3%	16,386,706		33,816	65.1%	33,816		13,834,047	29,503
Aug-17	14,220,729	1,119,863	7.3%	15,340,593		32,977	62.5%	32,977		13,036,544	30,171
Sep-17	12,211,411	961,632	7.3%	13,173,043		31,418	58.2%	31,418		12,451,029	24,561
Oct-17	10,915,463	859,578	7.3%	11,775,041		23,660	68.9%	23,660		11,789,768	25,117
Nov-17	11,280,916	888,357	7.3%	12,169,273		25,671	68.8%	25,671		12,870,059	28,971
Dec-17	11,565,298	910,752	7.3%	12,476,050	158,774,256	24,204	69.3%	24,204	33,816	15,042,526	33,810
Jan-18	12,824,162	1,009,885	7.3%	13,834,047		29,503	63.0%	29,503		16,675,957	34,413
Feb-18	12,084,876	951,668	7.3%	13,036,544		30,171	64.3%	30,171		18,162,578	34,562
Mar-18	11,542,104	908,925	7.3%	12,451,029		24,561	66.1%	24,561		13,409,706	31,982
Apr-18	10,930,385	861,383	7.3%	11,799,768		25,117	65.2%	25,117		11,967,240	24,046
May-18	11,930,545	939,514	7.3%	12,870,059	160,354,680	28,971	59.7%	28,971		12,358,510	26,071
Jun-18	13,944,421	1,098,104	7.3%	15,042,526		33,810	61.8%	33,810		12,668,558	24,574
Jul-18	15,458,612	1,217,345	7.3%	16,675,957		34,413	65.1%	34,413		13,877,915	28,997
Aug-18	14,472,860	1,139,718	7.3%	15,612,578		33,562	62.5%	33,562		13,081,700	30,276
Sep-18	12,430,787	978,909	7.3%	13,409,706		24,046	66.9%	24,046		12,544,061	24,744
Oct-18	11,093,632	873,609	7.3%	11,967,240		24,046	66.2%	24,046		11,952,430	25,442
Nov-18	11,456,339	902,171	7.3%	12,358,510		26,071	65.8%	26,071		11,952,430	25,442
Dec-18	11,741,899	924,659	7.3%	12,668,558	161,724,522	24,574	69.3%	24,574	34,413	13,037,201	29,347
Jan-19	12,864,827	1,013,088	7.3%	13,877,915		29,597	63.0%	29,597		15,147,273	34,046
Feb-19	12,126,735	954,964	7.3%	13,081,700		30,276	64.3%	30,276		16,792,323	34,653
Mar-19	11,628,345	915,716	7.3%	12,544,061		24,744	66.1%	24,744		15,147,273	34,046
Apr-19	11,079,903	872,527	7.3%	11,952,430		25,442	65.2%	25,442		15,772,617	33,906
May-19	12,085,485	951,716	7.3%	13,037,201	162,331,129	29,347	59.7%	29,347		13,580,982	32,391
Jun-19	14,041,522	1,105,751	7.3%	15,147,273		34,046	61.8%	34,046		12,160,964	24,436
Jul-19	15,566,483	1,225,840	7.3%	16,792,323		34,653	65.1%	34,653		12,538,159	26,450
Aug-19	14,621,216	1,151,401	7.3%	15,772,617		33,906	62.5%	33,906		12,847,520	24,925
Sep-19	12,589,571	991,412	7.3%	13,580,982		32,391	58.2%	32,391		14,057,555	29,980
Oct-19	11,273,214	887,750	7.3%	12,160,964		24,436	66.9%	24,436		13,273,108	29,659
Nov-19	11,622,873	915,286	7.3%	12,538,159		26,450	65.8%	26,450		12,723,340	25,098
Dec-19	11,909,651	937,869	7.3%	12,847,520	163,333,145	24,925	69.3%	24,925	34,653	12,146,459	25,855
Jan-20	13,031,354	1,026,202	7.3%	14,057,555		29,980	63.0%	29,980		13,249,274	29,825
Feb-20	12,304,171	968,937	7.3%	13,273,108		29,659	64.3%	29,659		15,378,542	34,566
Mar-20	11,794,536	928,804	7.3%	12,723,340		25,098	66.1%	25,098		17,057,722	35,201
Apr-20	11,259,767	866,692	7.3%	12,146,459	164,520,844	25,855	65.2%	25,855		16,029,283	34,458
May-20	12,282,077	967,197	7.3%	13,249,274		29,825	59.7%	29,825		13,809,008	32,935
Jun-20	14,255,909	1,122,634	7.3%	15,378,542		34,566	61.8%	34,566		12,380,998	24,878
Jul-20	15,812,508	1,245,214	7.3%	17,057,722		35,201	65.1%	35,201		12,759,978	26,903
Aug-20	14,859,146	1,170,138	7.3%	16,029,283		34,458	62.5%	34,458		13,063,638	25,344
Sep-20	12,800,950	1,008,058	7.3%	13,809,008		32,935	58.2%	32,935			
Oct-20	11,477,185	903,813	7.3%	12,380,998		24,878	66.9%	24,878			
Nov-20	11,822,011	930,967	7.3%	12,759,978		26,903	65.8%	26,903			
Dec-20	12,109,992	953,646	7.3%	13,063,638	165,921,906	25,344	69.3%	25,344	35,201		

TOTAL SYSTEM ACTUAL AND FORECAST LOADS

Mo.	Typ Load Factor						Typ Power Factor						Avg Mo. P.F.	
	2011	2012	2013	2014	2015	2016	Avg Mo. L.F.	2011	2012	2013	2014	2015		2016
Jan	66.1%	61.2%	67.0%	58.9%	56.2%	68.8%	63.0%	0.91887	0.91224	0.90981	0.92217	0.91791	0.91585	0.91614
Feb	64.1%	62.0%	69.7%	64.0%	59.4%	66.6%	64.3%	0.91132	0.91221	0.91414	0.91477	0.92013	0.91267	0.91421
Mar	70.2%	66.0%	65.5%	66.4%	69.3%	71.4%	68.1%	0.89789	0.89201	0.91128	0.91052	0.90430	0.89734	0.90223
Apr	67.1%	59.5%	66.4%	69.5%	65.7%	63.4%	65.2%	0.88359	0.89047	0.88907	0.89227	0.88809	0.88745	0.88849
May	52.6%	62.4%	60.1%	60.3%	61.4%	61.5%	59.7%	0.87596	0.87705	0.88092	0.88139	0.87732	0.88556	0.87970
Jun	62.4%	55.9%	62.2%	65.6%	62.9%		61.8%	0.86621	0.87160	0.86935	0.87370	0.87374		0.87092
Jul	67.0%	66.7%	63.7%	62.8%	65.6%		65.1%	0.86522	0.86799	0.86313	0.87427	0.86766		0.86765
Aug	64.7%	62.2%	61.8%	63.0%	61.0%		62.5%	0.86644	0.87029	0.86519	0.87581	0.86774		0.86909
Sep	53.4%	60.0%	61.9%	58.1%	57.8%		58.2%	0.87404	0.87628	0.87257	0.87675	0.87611		0.87515
Oct	72.1%	67.6%	64.1%	61.6%	69.0%		66.9%	0.89310	0.89152	0.88930	0.88801	0.88497		0.88938
Nov	67.9%	70.4%	66.1%	58.6%	66.2%		65.8%	0.90559	0.91499	0.90945	0.91251	0.91251		0.91101
Dec	69.8%	72.2%	67.1%	67.1%	70.2%		69.3%	0.91146	0.91421	0.91289	0.91303	0.91303		0.91292

Total System Actual and Forecast

