# **ENERGY & PEAK LOAD FORECAST**

# **CAROLINA POWER & LIGHT COMPANY**



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# **Overview**

CP&L's forecasting process has evolved over time. Currently econometric and end-use energy forecasts and an internally consistent system peak load forecast are produced. A load factor approach is used for the Load Forecast, using the energy forecast as direct input in producing the forecast of annual system peak load. This Load Forecast method assures that there is a direct coupling between the two forecasts, sharing assumptions and data.

A summary of the December 1992 Energy and Peak Load forecast is provided in this report. Details of the forecast processes for the energy and load forecasts, data, and assumptions are provided in a separate technical appendix.

The Econometric and Load Forecast processes have been based on sophisticated statistical methods since the mid-70s. During this time enhancements have been made to the methodology as data became more available and accessible from computerized sources and software capable of processing the data into useful and meaningful forms became increasingly available. Enhancements have also been undertaken over time to meet the changing data needs of internal and external customers. The increasing sophistication of planning challenges are requiring data at increasing levels of detail. In response to these changing planning needs, CP&L's forecast processes have been expanded to include energy forecasts at the end-use level and hourly load forecasts, or load shapes.

During 1991, energy forecasts were first produced for commercial and residential end-uses in parallel with the econometric forecast. EPRI's COMMEND and REEPS software were used for these end-use energy forecasts, respectively. These models combine engineering detail with economic relationships to produce appliance level forecasts within specific customer groups. Both REEPS and COMMEND forecast energy consumption using the choices by consumers of specific equipment, energy efficiency, and utilization of that equipment. Industrial end-use forecasting is in development at this time.

End-use forecasting requires a major commitment of time, data, and resources. End-use models require collection and analysis of an enormous quantity of data, much of which is not available on a utility service area basis. EPRI's commercial and residential end-use models are provided with default data reflecting either national or broad regional characteristics. However, these data must be carefully analyzed and often modified to reflect service area specific characteristics.

End-use models should not be seen as a replacement for econometric methods. The use of two approaches is not superfluous duplication because each forecasting method has unique strengths which largely determine the usefulness of the results. Econometric approaches have the strength of using observable market-determined trends spanning many years, but do not immediately capture structural shifts in market behavior. End-use approaches, on the other hand, have the strength of modeling explicit technology, efficiency, and appliance choices; but base such choices on data from a single base year.

# FORECAST - EXECUTIVE SUMMARY

The CP&L Energy Forecast process has historically been based on an econometric forecast methodology. During 1991 end-use energy forecast methodologies for the residential and commercial customer classes were added to the energy forecast process. For each of these methodologies, three analyses may be performed each year - a reference case and higher and slower growth scenarios. The forecast adopted by CP&L as the Company forecast in December 1992 is the Slower Load Growth Scenario, which reflects inputs from the results of both the econometric and end-use methodologies. The energy forecast becomes the major input for the load forecast process, assuring consistency of assumptions and methodology between the two forecasts.

The Reference Case has historically been most representative of CP&L's future growth and adopted as the Company forecast of energy growth. In 1991 the Slower Growth Scenario was adopted as the Company forecast to reflect the slower electricity growth which is expected to characterize the future. A large factor influencing that decision is the changing relationships and power availability in the wholesale markets. In addition, other prospects such as increasing appliance efficiency, stricter building codes, industrial cogeneration, and environmental awareness all tend toward slower growth. The Company adopted energy and load projections based on the Slower Growth Scenario to serve as a collective proxy for the reduced growth in future electricity needs served by CP&L resulting from these and similar factors.

Those collective factors continue to characterize the long term future electricity needs served by CP&L, and are reflected in the slower long term growth of the 1992 energy and load forecasts. Since the factors which result in slower long term growth do not become an influence during the first years of the forecast, the early part of the forecast is expected to more closely follow the reference case growth levels. The period of 1993 through 1995 is based on the Reference Case, while the later period from 1997 through 2011 is based on the slower growth scenarios. The transition year of the forecast, 1996, is a blending of the Reference Case and the slower growth scenarios.

Prior to the 1991 forecast, end-use models were not available and the forecast was solely a product of the econometric forecast methodology. In 1991 the econometric and end-use results for the residential and commercial customer classes were virtually indistinguishable. This year the end-use results have indicated that our customers will make slightly higher efficiency appliance choices sooner than previously anticipated. In order to incorporate these new results into the forecast end-use and econometric results have been averaged for the residential and commercial customer classes.

The forecast approved in December 1992 projects annual compound growth of 1.7% for energy and 1.6% for system peak demand. This is an increase of nearly 16,000 GWh annual energy and 2,900 MW peak demand. These data reflect reductions to the forecast due to conservation and load management.

A summary of the Slower Load Growth Scenario adopted as the Company's 1992 Energy and Load Forecast is provided in the table which immediately follows. Graphs are also provided to show the difference between the 1992 and 1991 forecasts. The Energy Forecast states all data at the meter. The Load Forecast provides total load and energy input at generation level, including losses and company uses. Customer level detail from the peak load forecast is generally at the customer meter, and is noted as such on the tables presenting customer class data. As described above, the Energy and Peak Load Forecasts (Slower Load Growth Scenario) incorporate the results of the Reference Case in the near term and a combination of both the econometric and end-use slower growth scenarios in the longer term.

Because the System Energy Sales forecast is the primary input to the System Peak Load forecast, those factors which influence a change in forecast energy use also influence similar changes in projected peak load. Additionally, the System Peak Load forecast is influenced to a greater extent by load management. A discussion of those assumptions which influence both the energy sales and peak load forecasts is contained in the sections which follow.

	AT METER			
	LEVEL	AT G	ENERATION LE	VEL
		SUMMER	ENERGY	SYSTEM
	CUSTOMER	PEAK	INPUT TO	LOAD
	ENERGY	LOAD	SYSTEM	FACTOR
YEAR	(MWH)	(MW)	(MWH)	(%)
1993	45,951,257	8,992	48,323,951	61.4%
1994	46,978,169	9,172	49,419,991	61.5%
1995	47,980,978	9,306	50,490,470	61.9%
1996	48,598,266	9,436	51,153,809	61.9%
1997	49,249,187	9,559	51,852,108	61.9%
1998	50,311,507	9,756	52,968,337	62.0%
1999	51,399,918	9,963	54,111,138	62.0%
2000	52,503,716	10,172	55,270,298	62.0%
2001	53,574,282	10,375	56,394,032	62.0%
2002	54,629,619	10,579	57,502,175	62.1%
2003	55,617,612	10,769	58,540,404	62.1%
2004	56,570,619	10,953	59,540,326	62.1%
2005	57,459,054	11,126	60,474,199	62.0%
2006	58,213,161	11,269	61,265,239	62.1%
2007	58,949,824	11,411	62,039,362	62.1%
2008	59,713,590	11,556	62,841,536	62.1%
2009	60,473,683	11,703	63,639,551	62.1%
2010	61,174,204	11,838	64,375,363	62.1%
2011	61,829,251	11,963	65,063,381	62.1%

### DECEMBER 1992 SLOWER LOAD GROWTH SCENARIO REDUCED BY CONSERVATION AND LOAD MANAGEMENT



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# SYSTEM ENERGY FORECAST

# SYSTEM ENERGY FORECAST DESCRIPTION

The December 1992 System Energy forecast continues to include retail energy sales, demandside management effects, wholesale energy usage, and the total North Carolina Eastern Municipal Power Agency (NCEMPA) energy requirements. Revenue class energies are forecast using comprehensive econometric service area based models. In addition, residential and commercial end-use models were also run in parallel to the econometric models. A brief description of the assumptions and considerations used in the forecast of System Energy usage is given on the following pages.

# ...General...

Generally, the standard of living as reflected in personal income and GNP will remain comparable to that enjoyed today. The labor force can be predicted with some reliability because the working population for the early 2000s has already been born. Real dollar prices are used to enhance model reliability during periods of varying inflation. All scenarios of the forecast assume that our customers will tend toward continuing energy efficiency in the future. More efficient electrical equipment, continued conservation measures, specific load management programs, and changing relationships in Wholesale power markets are expected to result in slower energy growth when compared with the 1970s and 1980s.

The forecast of System Energy usage does not explicitly incorporate periodic expansions and contractions of business cycles which are likely to occur from time to time during the forecast period. While long-run economic trends exhibit considerable stability, short-run economic activity is subject to substantial variation. The exact nature, timing and magnitude of such short-run variations are unknown years in advance of their occurrence. The Energy forecast, while it is a trended projection, nonetheless reflects the general long-run outcome of business cycles because actual historical data which contain both expansions and contractions are used to develop the general relationships between economic activity and energy use.

# ...Residential Class...

The overall forecast of residential energy is very close to last year's forecast, with slightly lower growth in the short run, and stronger growth in later years. This is primarily due to the expected increases in natural gas prices relative to CP&L electricity prices occurring at a more gradual rate in the early years of the forecast. Relatively lower electricity prices translate into electricity becoming an even more preferred fuel, especially in the later years of the forecast.

A growing share of our customers are expected to live in all-electric homes, and overall electricity use per customer is expected to slightly increase.

# ...Commercial Class...

Growth in commercial energy is projected to increase over the forecast period at an average annual rate that is less than historical patterns. This moderation stems primarily from appreciably slower floorstock growth in the aftermath of the building spree of the 1980's. In addition, the typical efficiency of all end-uses is increasing, contributing to a reduction in electricity growth rates.

# ...Industrial Class...

Because of the substantial variation in the levels of energy intensiveness in this sector, a twodigit SIC code representation is used. It is assumed that labor productivity within CP&L's service area is comparable to the output per employee nationally. National forecasts of output per employee are combined with forecasts of service area employment (by SIC code) to produce a service area production index. The industrial energy forecast is slightly above last year's forecast through the forecast horizon. This is attributable to increased productivity and growth in electro-technologies relative to last year's forecast.

# ....Sales-for-Resale Class...

The forecast for energy in the sales-for-resale sector assumes those receiving power from the EMCs and the municipalities within the Company's service area are subject to the same economic conditions, weather, etc., as CP&L retail customers. Weather and the relative price relationship between electricity and alternative fuels are used in the energy projections.

Sales-for-resale are slightly higher in the early years of the forecast due to the stronger earlyyear economic conditions assumed in the Slower Load Growth scenario. Sales in later years converge to approximate last year's forecast.

# ...Demand-Side Management...

The forms of conservation available to customers are diverse. These forms range from the insulation of homes and installation of energy efficient appliances to the adjustment of thermostats and other lifestyle changes. Conservation activities generally result in a reduction in energy consumption. In addition to conservation effects, the System Energy forecast treats explicitly the effects associated with the load management portion of the Company's DSM Program.

# SYSTEM ENERGY FORECAST BY CUSTOMER CLASS

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# DECEMBER 1992 SYSTEM ENERGY FORECAST REDUCED BY CONSERVATION AND LOAD MANAGEMENT SLOWER LOAD GROWTH SCENARIO AT METER LEVEL

				HIGHWAY				
				& STREET		SALES-FOR		SYSTEM
	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	LIGHTING	MILITARY	-RESALE	NCEMPA	TOTAL
	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)
								======
1993	11,158,395	8,111,911	13,062,113	97,046	1,120,876	6,668,740	5,732,176	45,951,257
1994	11,462,838	8,372,508	13,202,223	97,532	1,126,480	6,839,688	5,876,900	46,978,169
1995	11,777,927	8,609,692	13,429,450	98,019	1,132,113	6,911,731	6,022,046	47,980,978
1996	12,084,497	8,701,567	13,443,753	98,509	1,137,773	7,036,097	6,096,070	48,598,266
1997	12,389,154	8,760,853	13,459,734	99,002	1,143,462	7,238,877	6,158,105	49,249,187
1998	12,726,739	8,903,349	13,669,112	99,497	1,149,180	7,473,782	6,289,848	50,311.507
1999	13,069,108	9,078,402	13,869,971	99,994	1,154,925	7,705,421	6,422,097	51,399,918
2000	13,412,275	9,253,277	14,098,030	100,494	1,160,700	7,932,855	6,546,085	52,503,716
2001	13,753,980	9,407,316	14,325,472	100,997	1,166,504	8,151,668	6,668,345	53,574,282
2002	14,098,909	9,551,524	14,552,862	101,502	1,172,336	8,362,056	6,790,431	54,629,619
2003	14,435,810	9,684,651	14,760,045	102,009	1,178,198	8,566,619	6,890,280	55,617,612
2004	14,750,155	9,816,080	14,967,468	102,519	1,184,089	8,770,771	6,979,537	56,570,619
2005	15,051,589	9,942,008	15,138,407	103,032	1,190,009	8,973,076	7,060,933	57,459,054
2006	15,315,037	10,027,239	15,285,873	103,547	1,195,959	9,160,212	7,125,294	58,213,161
2007	15,556,948	10,126,134	15,434,862	104,065	1,201,939	9,333,465	7,192,411	58,949,824
2008	15,779,451	10,246,804	15,594,031	104,585	1,207,949	9,507,105	7,273,665	59,713,590
2009	16,011,612	10,362,825	15,747,260	105,108	1,213,988	9,680,276	7,352,615	60,473,683
2010	16,228,941	10,473,595	15,868,958	105,634	1,220,058	9,851,823	7,425,195	61,174,204
2011	16,441,756	10,546,101	15,990,812	106,162	1,226,159	10,016,734	7,501,528	61,829,251

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# **REVIEW AND ANALYSIS OF HISTORIC ENERGY USAGE**

The figure below combines the Company's actual energy experience with the current projections of electricity use in the future. The figure starts in the early 1970s because that was the time when usage patterns for all forms of energy appreciably changed as a result of the first worldwide oil price shocks.

The comparison of actual electricity usage with forecast usage illustrates how the future is expected to unfold relative to the past. To help with this comparison, a trendline has been added. This trendline can be thought of as a trend of electricity usage around the frequent ups and downs seen in the actual usage from 1972 through 1991. This trendline was then extended into the future for comparison with the energy forecast. It is important to recognize that the trendline is not used for forecasting purposes; it is used only to provide some basis of comparison.

The figure illustrates several important points. Actual electricity usage has at times been both above and below the long-term trend. Even though energy consumption has this up and down pattern, it has repeatedly cycled around a long-term trend.

Our current energy projections are shown as the dashed line. Electricity usage in the future is seen to remain below the trendline extension suggesting that the growth in future energy usage will be less than that of the past. The main reasons for generally slower energy growth in the future are the Company's continuing commitment to conservation and load management, a general slowing of population growth, changing relationships and power availability in our wholesale markets, and the increasing emphasis on general energy efficiency.



## ...Forecast Perspective...

The forecast average annual compound growth for several 5-year periods are shown below. For example, the 1.7% compounded growth from 1993 through 2011 would be an increase of 15,878 GWh over the forecast period. Though projected percentage growth has slowed, incremental System Energy usage is still forecast to increase between approximately 4,300 and 5,400 GWh every five years through 2011. The Company's System Total Energy usage in 1960 of 5,875 GWh is shown for comparison.



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# SYSTEM PEAK LOAD FORECAST

The System Peak Load forecast is developed annually using the System Energy forecast and load management program effects as primary inputs. In turn, the peak load forecast after reduction for load management effects becomes the basis for determining the need for new supply-side resources in the Company's Integrated Resource Plan.

# SYSTEM PEAK LOAD FORECAST PROCESS

Development of the System Peak Load forecast can be viewed as the three step process shown below. Loads for CP&L wholesale and retail customer classes are calculated before reduction for load management effects. A major input at this stage of the load forecast process is the System Energy forecast. The total of all these loads is adjusted for losses between generation and the customer meter. Load reductions associated with the load management portion of the Company's Demand-Side Management (DSM) Program are subtracted from the total of Class Loads, Company Uses, and Losses. North Carolina Eastern Municipal Power Agency (NCEMPA) requirements are added in the final step to determine System Peak Load.



## DECEMBER 1992 PEAK LOAD FORECAST SLOWER LOAD GROWTH SCENARIO

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# SUMMARY OF SUMMER COINCIDENT PEAK LOAD COMPONENTS

	AT THE METER - NOT REDUCED FOR LOAD MANAGEMENT								AT THE	GENERATOR	
( YEAR	RESIDENTIAL (MW)	COMMERCIAL AND MUNI. PUMPING (MW)	INDUSTRIAL (MW)	MILITARY (MW)	HIGHWAY & STREET LIGHTING (MW)	(1),(2) SALES-FOR -RESALE (MW)	COMPANY USE (MW)	Losses (MW)	LOAD MANAGEMENT REDUCTIONS (MW)	(1) NCEMPA (MW)	TOTAL SYSTEM (MW)
====	=======	=======	=========	2232222	=	1 255	25	409	660	1 199	8 997
1993	2,014	1,834	1,981	214	0	1,05	25	405	729	1,230	9 172
1994	2,685	1,914	2,000	213	0	1,405	26	428	791	1,250	9 306
1995	2,739	1,909	2,042	210	0	1,355	20	435	828	1,200	9 436
1992	2,831	2 004	2,044	217	0	1 495	27	442	864	1.288	9.559
1997	2,703	2,004	2,040	219	ů O	1 544	28	452	899	1.315	9.756
1996	3,062	2,077	2,111	220	0	1.593	28	462	934	1.342	9,963
2000	3 143	2.117	2.147	221	0	1.642	29	473	967	1.368	10.172
2000	3,223	2.152	2,182	222	0	1,689	29	483	998	1,393	10,375
2002	3,303	2,185	2,216	224	0	1,734	30	493	1,025	1,419	10,579
2003	3,382	2,216	2,247	225	0	1,780	31	502	1,052	1,439	10,769
2004	3,456	2,246	2,279	226	0	1,825	31	511	1,079	1,458	10,953
2005	3,527	2,275	2,307	227	0	1,871	32	520	1,106	1,474	11,126
2006	3,589	2,294	2,329	228	0	1,915	32	527	1,132	1,488	11,269
2007	3,645	2,317	2,352	229	0	1,956	32	534	1,157	1,501	11,411
2008	3,698	2,345	2,375	230	0	1,996	33	542	1,181	1,518	11,556
2009	3,752	2,372	2,399	231	0	2,037	33	549	1,204	1,534	11,703
2010	3,803	2,397	2,418	233	0	2,077	34	556	1,229	1,549	11,838
2011	3,853	2,414	2,439	234	0	2,116	34	562	1,253	1,565	11.963

(1) Includes load provided by SEPA.

(2) Reduced to reflect generation by City of Fayetteville peak shaving facilities.

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### DECEMBER 1992 PEAK LOAD FORECAST SLOWER LOAD GROWTH SCENARIO

# SUMMARY OF ANNUAL ENERGY COMPONENTS

	AT THE METER - NOT REDUCED FOR LOAD MANAGEMENT							AT	THE GENERATO	R	
	-	COMMERCIAL			HIGHWAY	(1),(2)			LOAD		
		& MUNI.			& STREET	SALES-FOR	COMPANY		MANAGEMENT	(1)	TOTAL
	RESIDENTIAL	PUMPING	INDUSTRIAL	MILITARY	LIGHTING	-RESALE	USE	LOSSES	REDUCTIONS	NCEMPA	SYSTEM
YEAR	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)
===	==========			======	======		=====				
1993	11,163,797	8,120,818	13,328,839	1,120,876	97,046	6,668,740	110,819	2,075,343	216,172	5,853,845	48,323,951
1994	11,469,946	8,384,245	13,474,988	1,126,480	97,532	6,839,688	113,271	2,121,188	208,986	6,001,640	49,419,991
1995	11,786,736	8,624,607	13,711,808	1,132,113	98,019	6,911,731	115,671	2,166,035	206,118	6,149,868	50,490,470
1996	12,093,595	8,716,767	13,733,351	1,137,773	98,509	7,036,097	117,154	2,193,992	198,894	6,225,465	51,153,809
1997	12,398,630	8,776,823	13,759,124	1,143,462	99,002	7,238,877	118,737	2,224,085	195,449	6,288,817	51,852,108
1998	12,736,559	8,920,602	13,987,364	1,149,180	99,497	7,473,782	121,309	2,272,482	215,793	6,423,357	52,968,337
1999	13,079,484	9,095,953	14,207,590	1,154,925	99,994	7,705,421	123,945	2,322,126	236,712	6,558,411	54,111,138
2000	13,423,011	9,271,633	14,449,124	1,160,700	100,494	7,932,855	126,609	2,372,448	251,608	6,685,032	55,270,298
2001	13,765,126	9,425,979	14,689,680	1,166,504	100,997	8,151,668	129,186	2,421,144	266,140	6,809,888	56,394,032
2002	14,110,465	9,570,991	14,924,214	1,172,336	101,502	8,362,056	131,715	2,468,868	274,540	6,934,567	57,502,175
2003	14,447,828	9,705,427	15,140,180	1,178,198	102,009	8,566,619	134,103	2,514,133	284,630	7,036,536	58,540,404
2004	14,762,587	9,836,668	15,355,420	1,184,089	102,519	8,770,771	136,409	2,557,923	293,747	7,127,688	59,540,326
2005	15,064,487	9,963,910	15,539,237	1,190,009	103,032	8,973,076	138,575	2,599,124	308,063	7,210,813	60,474,199
2006	15,328,363	10,048,973	15,695,670	1,195,959	103,547	9,160,212	140,403	2,634,001	318,431	7,276,541	61,265,239
2007	15,570,606	10,149,205	15,854,126	1,201,939	104,065	9,333,465	142,187	2,668,013	329,327	7,345,083	62,039,362
2008	15,793,750	10,270,725	16,021,227	1,207,949	104,585	9,507,105	144,020	2,702,807	338,692	7,428,061	62,841,536
2009	16,026,303	10,387,598	16,180,116	1,213,988	105,108	9,680,276	145,840	2,737,368	345,736	7,508,689	63,639,551
2010	16,244,181	10,499,230	16,316,315	1,220,058	105,634	9,851,823	147,538	2,769,659	361,885	7,582,810	64,375,363
2011	16,457,500	10,572,607	16,458,374	1,226,159	106,162	10,016,734	149,130	2,799,867	383,916	7,660,764	65,063,381

(1) Includes load provided by SEPA.

(2) Reduced to reflect generation by City of Fayetteville peak shaving facilities.

# DEMAND-SIDE MANAGEMENT IMPACT

Conservation is implicitly reflected in the load forecast as a result of using historical data to develop the System Energy forecast. Because conservation is reflected in the forecast process, load management alone is subtracted from the gross load forecast. This approach prevents a double counting of conservation effects.

Load management has provided significant reductions to system peak load and is expected to continue to do so in the future. Between 1993 and the end of the forecast period in 2011, load management reductions are expected to increase approximately 590 MW. This represents a reduction of 17% of the forecast load growth during this time period if load management was not available.

Load management totals used in the load forecast do not include the projected purchases from sell-excess cogenerators and small power producers. These are included in supply-side tabulations as Company Power Resources. Since load management type programs are primarily intended to reduce system seasonal peaks, the associated energy reduction is proportionately much smaller. Reductions due to load management efforts tend to result in increases in forecast system load factor. Load management affects the growth rates of both system energy sales and system peak load; however, the energy sales reduction is a much smaller percentage than the peak load reduction. This tends to make the growth rate for demand lower than the growth rate for energy and correspondingly increase load factor.

# ...Adjusted System Peak Loads 1976-1992...

Adjustments have been calculated for recent winter and summer System Peak Loads to estimate the seasonal peak load if typical peaking temperatures had occurred. The following figure provides chronological summer/winter plots of the actual and adjusted peak loads for the period Winter 1975/1976-Summer 1992. As shown, the adjusted seasonal peak loads demonstrate a more stable pattern of growth. A noticeable increase in adjusted load occurs from Summer 1983 to Winter 1983-1984 from the accelerating recovery from depressed economic conditions and the addition of nearly 200 MW of NCEMPA load in January 1984.



Actual peak loads adjusted for abnormal temperatures and load management produce a more valid comparison to forecast peak loads than comparing with actual data.

# SYSTEM WINTER PEAK FORECAST

The System winter Peak has been calculated on the basis of the historic relationship between summer and winter peaks.

The winter peak is forecast to occur during the continuous period of December through February.

# DECEMBER 1992 PEAK LOAD FORECAST SLOWER LOAD GROWTH SCENARIO

# WINTER PEAK LOAD FORECAST

SYSTEM
WINTER
PEAK LOAD
(MW)
========
8,632
8,805
8,934
9,059
9,177
9,366
9,564
9,765
9,960
10,156
10,338
10,515
10,681
10,818
10,955
11,094
11,235
11,364
11,484

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# SYSTEM ENERGY USAGE FORECAST COMPARISON SLOWER LOAD GROWTH SCENARIO AT METER LEVEL

	DECEMBER	DECEMBER		
,	SLOWER	1991		
	GROWTH	SLOWER		
	SCENARIO	SCENARIO	CHANGE	
YEAR	(MWH)	(MWH)	(MWH)	%
				====
1992		43,501,663		
1993	45,951,257	45,334,661	616,596	1.4%
1994	46,978,169	46,721,926	256,243	0.5%
1995	47,980,978	47,614,969	366,009	0.8%
1996	48,598,266	48,356,311	241,955	0.5%
1997	49,249,187	49,065,203	183,984	0.4%
1998	50,311,507	49,859,564	451,943	0.9%
1999	51,399,918	50,663,982	735,936	1.5%
2000	52,503,716	51,403,552	1,100,164	2.1%
2001	53,574,282	52,093,733	1,480,549	2.8%
2002	54,629,619	52,765,786	1,863,833	3.5%
2003	55,617,612	53,420,504	2,197,108	4.1%
2004	56,570,619	54,107,276	2,463,343	4.6%
2005	57,459,054	54,874,743	2,584,311	4.7%
2006	58,213,161	55,626,234	2,586,927	4.7%
2007	58,949,824	56,416,366	2,533,458	4.5%
2008	59,713,590	57,200,026	2,513,564	4.4%
2009	60,473,683	57,990,163	2,483,520	4.3%
2010	61,174,204	58,835,029	2,339,175	4.0%
2011	61,829,251	59,670,401	2,158,850	3.6%

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# SYSTEM SUMMER PEAK DEMAND FORECAST COMPARISON SLOWER LOAD GROWTH SCENARIO AT GENERATION LEVEL

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	DECEMBER 1992	DECEMBER		
	SLOWER LOAD	1991		
	GROWTH	SLOWER GROWTH		
	SCENARIO	SCENARIO	CHANGE	
YEAR	(MW)	(MW)	(MW)	%
			=====	
1992		8,631		
1993	8,992	8,969	23	0.3%
1994	9,172	9,226	-54	-0.6%
199 <b>5</b>	9,306	9,364	-58	-0.6%
1996	9,436	9,516	-80	-0.8%
1997	9,559	9,646	-87	-0.9%
1998	9,756	9,796	-40	-0.4%
1999	9,963	9,949	14	0.1%
2000	10,172	10,095	77	0.8%
2001	10,375	10,227	148	1.4%
2002	10,579	10,356	223	2.2%
2003	10,769	10,483	286	2.7%
2004	10,953	10,615	338	3.2%
2005	11,126	10,753	373	3.5%
2006	11,269	10,896	373	3.4%
2007	11,411	11,052	359	3.2%
2008	11,556	11,210	346	3.1%
2009	11,703	11,368	335	2.9%
2010	11,838	11,526	312	2.7%
2011	11,963			

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# COMPARISON AND TABULATION OF ADJUSTED SEASONAL PEAK LOADS, SUMMER and WINTER

SUMMER			WINTER			
	ACTUAL	ADJUSTED		ACTUAL	ADJUSTED	
YEAR	(MW)	(MW)	YEAR	(MW)	(MW)	
===	====		====		======	
			1975/76	4,968	4,878	
1976	5,121	5,236	1976/77	5,509	5,120	
1977	5,597	5,436	1977/78	5,605	5,388	
1978	5,538	5,717	1978/79	5,588	5,647	
1979	5,907	5,875	1979/80	5,809	5,839	
1980	6,139	6,055	1980/81	6,402	6,079	
1981	6,253	6,183	1981/82	6,602	6,144	
1982	6,089	6,435	1982/83	6,290	6,277	
1983	6,926	6,507	1983/84	6,598	6,810	
1984	6,869	7,079	1984/85	7,799	7,119	
1985	6,876	7,188	1985/86	7,763	7,370	
1986	7,485	7,243	1986/87	7,163	7,543	
1987	7,987	7,737	1987/88	7,921	7,766	
1988	8,523	7,945	1988/89	7,883	8,059	
1989	8,327	8,342	1989/90	8,209	7,871	
1990	8,681	8,584	1990/91	7,875	8,135	
1991	8,960	8,707	1991/92	8,066	8,364	
1992	9,236	9,166				

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# WESTERN SERVICE AREA WINTER NON-COINCIDENT PEAK LOAD FORECAST SLOWER LOAD GROWTH SCENARIO AT GENERATION LEVEL

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	WINTER NCP
YEAR	(MW)
======	
1992/93	646
1993/94	654
1994/95	659
1995/96	666
1996/97	672
1997/98	682
1998/99	693
1999/00	704
2000/01	715
2001/02	727
2002/03	738
2003/04	748
2004/05	758
2005/06	765
2006/07	773
2007/08	781
2008/09	789
2009/10	796
2010/11	802

# SYSTEM SUMMER PEAK LOAD AND ENERGY REDUCTIONS LOAD MANAGEMENT PORTION OF DSM ACTIVITIES SLOWER LOAD GROWTH SCENARIO AT GENERATION LEVEL

		PEAK LOAD	· · · · · · · · · · · · · · · · · · ·	ENERGY			
•			REDUCTION			REDUCTION	
	TOTAL	QUALIFYING	TO SYSTEM	TOTAL	QUALIFYING	TO ANNUAL	
	LOAD	FACILITIES	SUMMER	LOAD	FACILITIES	SYSTEM	
	MGMT.	PURCHASES	PEAK	MGMT.	PURCHASES	ENERGY	
YEAR	(MW)	(MW)	(MW)	(MWH)	(MWH)	(MWH)	
	====	======				<b>====</b> ===	
1993	844	190	660	1,676,959	1,241,245	216,172	
1994	911	191	729	1,700,188	1,241,245	208,986	
1995	972	191	791	1,725,830	1,241,245	206,118	
1996	1,008	191	828	1,744,677	1,241,245	198,894	
1997	1,042	191	864	1,764,845	1,241,245	195,449	
1998	1,077	191	899	1,793,543	1,241,245	215,793	
1999	1,112	191	934	1,822,313	1,241,245	236,712	
2000	1,146	191	967	1,844,639	1,241,245	251,608	
2001	1,176	191	998	1,865,896	1,241,245	266,140	
2002	1,203	191	1,025	1,880,092	1,241,245	274,540	
2003	1,231	191	1,052	1,895,357	1,241,245	284,630	
2004	1,257	191	1,079	1,909,392	1,241,245	293,747	
2005	1,285	191	1,106	1,928,594	1,241,245	308,063	
2006	1,310	191	1,132	1,943,840	1,241,245	318,431	
2007	1,335	191	1,157	1,959,452	1,241,245	329,327	
2008	1,359	191	1,181	1,973,290	1,241,245	338,692	
2009	1,382	191	1,204	1,984,645	1,241,245	345,736	
2010	1,407	191	1,229	2,004,651	1,241,245	361,885	
2011	1,432	191	1,253	2,030,086	1,241,245	383,916	

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# RESIDENTIAL CUSTOMERS BY CLASS AND TOTAL (1987-2011) SLOWER LOAD GROWTH SCENARIO

	ALL	WATER	MINIMUM	
	ELECTRIC	HEATER	USE	TOTAL
YEAR	CUSTOMERS	CUSTOMERS	CUSTOMERS	CUSTOMERS
				<b>= = =</b> = = = = = =
1987	333,541	339,003	91,884	764,428
1988	351,224	337,677	93,427	782,328
1989	367,032	336,743	94,886	798,661
1990	380,742	335,569	97,033	813,344
1991	394,029	334,114	98,593	826,735
1992	389,892	347,289	104,683	841,863
1993	387,702	356,397	109,360	853,460
1994	390,655	362,005	112,777	865,437
1995	399,100	364,316	114,927	878,344
1996	414,216	361,430	115,060	890,706
1997	431,447	356,052	114,246	901,745
1998	450,197	349,775	113,063	913,035
1999	470,419	342,177	111,355	923,951
2000	492,159	333,293	109,128	934,580
2001	514,676	324,039	106,731	945,446
2002	537,130	314,903	104,359	956,392
2003	558,581	306,534	102,270	967,385
2004	578,586	298,323	100,245	977,153
2005	597,145	291,058	98,574	986,777
2006	613,560	284,613	97,224	995,396
2007	628,215	278,916	96,163	1,003,294
2008	641,107	273,886	95,364	1,010,357
2009	653,753	269,927	94,965	1,018,644
2010	665,478	266,585	94,807	1,026,870
2011	676,698	263,960	94,932	1,035,589