7. Forecasts

7.1 2005 Load and Customer Forecast

November 26, 2004

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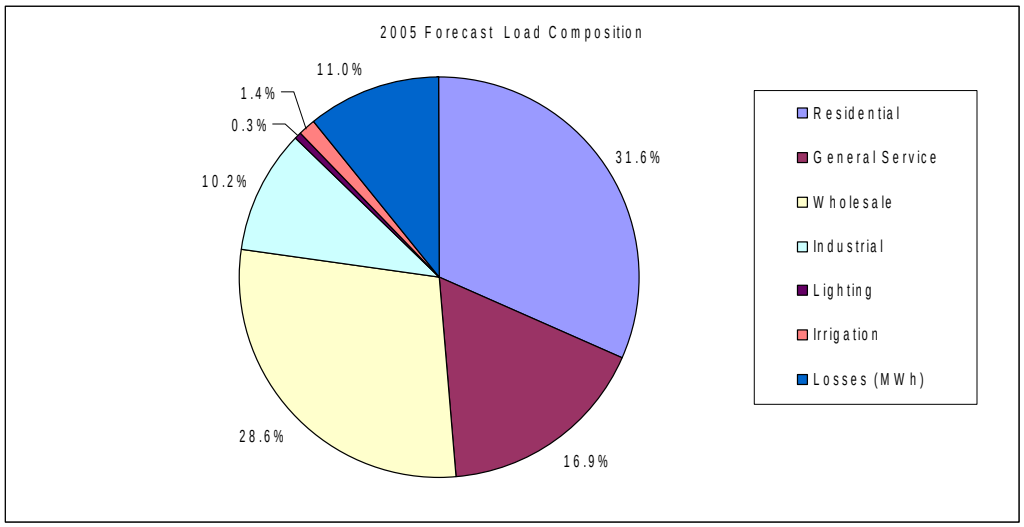
Executive Summary

The gross system load is a mix of residential, wholesale, general service, industrial, street lighting and irrigation loads and losses. The residential, general service and wholesale loads represent about 77% of the gross system load. These three load classes have historically exhibited a strong correlation to population levels and population growth rates. The industrial load represents about 10% of the gross load and is subject to a variety of economic trends. The remaining 13% includes irrigation, street lighting and system losses.



The 2005 load forecast is based on the population growth forecast generated by BC Stats and customized for the FortisBC service area. The population forecast formed a basis for predicting future volumes of residential wholesale and general service load. Industry specific information collected from major local industrial customers was used to forecast the volumes of industrial load. To the extent that this information was available, it conveys views and expectations of industrial load customers regarding future load growth.

The effects of the Demand Side Management ("DSM") program are also included in the forecast, with its anticipated reduction of energy consumption and system losses, and its effect on the system peak.

The gross system load is expected to reach 3,368 GW.h in 2005, a 2.0% increase above the forecast for 2004. This corresponds to a total of 97,380 customers expected in 2005 which is an increase of 2.3% above the current 2004 projections. The slower energy growth relative to the growth of the customer base, which is particularly evident in the residential class, is attributed to the utilization of more efficient electrical technologies mainly for heating and cooling and/or reducing the dependence on electricity for heating and cooling in favour of other available sources of energy

The following table summarizes the system energy requirements in GW.h and system peak in MW on a normalized basis.

Table 7.0

		Normalized				Forecast	
Load (GW.h)	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Sales	2,675	2,785	2,832	2,859	2,939	2,999
Losses	309	301	342	349	361	369
Gross Load	2,984	3,086	3,174	3,209	3,300	3,368
Percentage Change		3.4%	2.8%	1.1%	2.9%	2.0%

	Normalized				Forecast	
System Peak	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Expected Annual Winter Peak (MW)	650	698	647	680	700	712

Customer Count	Actual				Forecast	
(Year End)	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Total Customers	87,683	89,072	90,718	92,753	95,153	97,380
Customer Growth		1,389	1,646	2,035	2,400	2227
Percentage Change		1.6%	1.8%	2.2%	2.6%	2.3%

A detailed breakdown by customer class is provided in Appendix A.

Residential Class

The number of residential accounts has been experiencing strong growth as a result of the continued population growth over the last several years, although the growth of energy consumption in this class is somewhat mitigated by the declining consumption per customer. However this growth is expected to moderate in the future. For 2005, residential energy consumption is estimated at 1,064 GW.h with the number of residential accounts reaching 85,926.

General Service Class

The growth in the number of general service accounts is also driven by the population growth. Unlike the residential class, the energy consumption per general service customer is exhibiting an upward trend. The growth in terms of both energy and the number of customer accounts has been very strong in 2004 and is expected to moderate in the future. The energy consumption in this class is expected to reach 570 GW.h in 2005.

Wholesale Load

Energy sales in the wholesale class are expected to follow the growth pattern of the residential and general service class, which is expected given that the growth in the wholesale sector is driven by the same factors that influence the residential and general service loads. For 2005 the energy sales are expected to reach 964 GW.h.

Industrial Load

The industrial load in the FortisBC service area has varied significantly in the last several years. Celgar Pulp is the single biggest customer in this category and operational difficulties experienced in its recent history contributed to the observed volatility. The 2005 forecast for the industrial load is 343 GW.h, including Celgar.

1 Economic and Demographic Outlook

The FortisBC service area has been experiencing population growth at an increased rate over last several years. This kind of growth is expected to have significant impact on the load growth in the FortisBC service territory given the fact that if losses are included, 90% of load is affected by the population growth.

In 2004 FortisBC has been experiencing strong growth in terms of energy consumption and the number of customer accounts. The growth rate has been significantly above the long term growth rate set by the population growth. In order to account for this exceptional growth, the forecast of energy consumption and number of accounts for 2004 to 2009 has been decoupled from the population growth and adjusted to reflect the growth pattern experienced in 2004. It is anticipated that by 2009, the energy consumption and customer account growth rates will return to the long term growth rates driven by the population growth.

2 Forecast Methodology

The 2005 forecast for years beyond 2009 is based on the population forecast produced by BC Stats for the FortisBC service area adjusted as above, augmented by information about industrial load additions from large industrial customers to the extent such information is available.

2.1 Residential Class

The energy requirements for residential load are determined by:

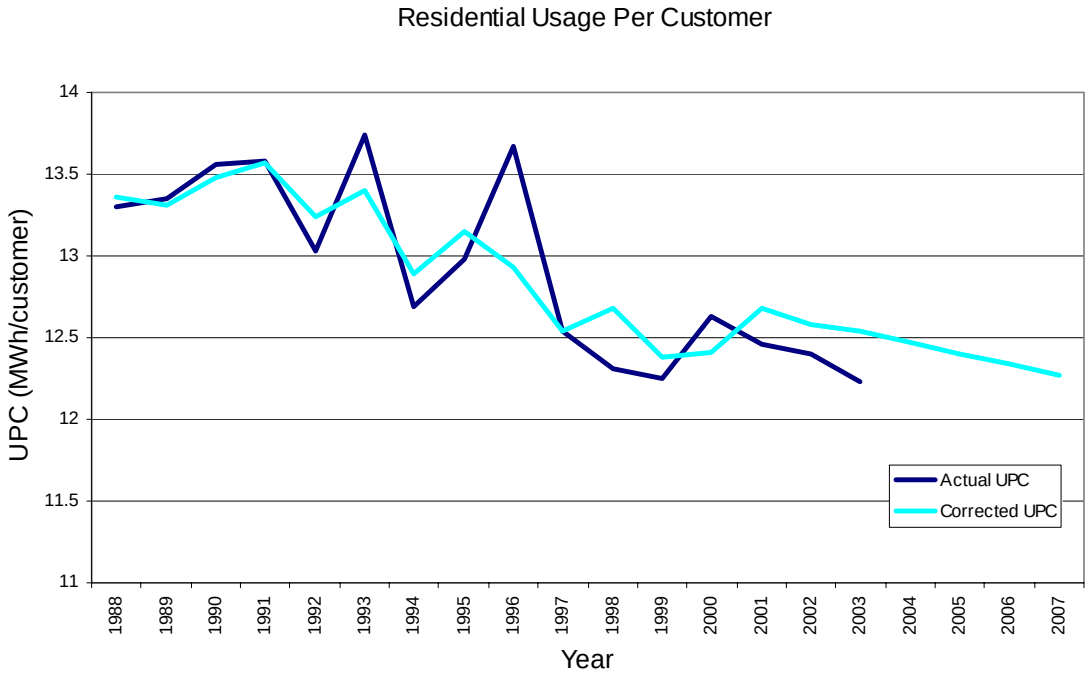
1. the number of residential customers
2. the Use Per Customer (UPC)

The number of residential customers is determined based on the historical relationship between the annual growth of the number of residential accounts and the population growth. Assuming the same relationship will continue to exist in the future, the forecast of the number of residential accounts is determined based on the BC Stats population forecast using a linear regression algorithm.

The number of residential accounts for 2005 is further adjusted in order to take into account the strong growth that FortisBC has been experiencing in 2004. It is expected that by 2009 and into the future, that growth in the number of residential accounts will return to the long term rate driven by the population growth.

The Use Per Customer is determined based on its 25 year average annual decline rate of 67 kW.h/customer. The availability of more efficient electrical appliances and declining dependence on electricity as a primary source of energy for heating and cooling are possible explanations for the gradual decline of the Use Per Customer.

The following figure illustrates the historical and forecast residential Use Per Customer. The line for Corrected Use Per Customer refers to normalized use as described in Section 4.



2.2 General Service Class

The general service class includes commercial and small industrial customers as well as schools, hospitals, recreation centres and other public facilities. Energy consumption in this class has historically been irregular because of great diversity in the customer size and the lumpiness of load additions. It is therefore more difficult to predict.

The approach used to forecast the energy consumption in this category is the same as that used for the residential class. General service Use Per Customer is predicted to increase by 26 kW.h annually.

2.3 Industrial Class

The industrial class includes loads in three categories: lumber, pulp and sundry. Celgar is the biggest single customer in this class. Annual Celgar consumption was estimated at 65 GW.h which is based on Celgar's recent projections. In the absence of more detailed information, this amount was treated as a long term average and kept constant for the duration of the forecast period.

The rest of the load industrial class was determined based on the existing historical relationship between this load and the net system load. Based on that relationship, this portion of the industrial load amounted to approximately 9% of the sales for 2005 and grew

slightly below the system sales growth rate. We have no reason to believe that this relationship and trend will be materially different in the future.

2.4 Wholesale Class

The wholesale class is comprised mainly of municipal electric utilities. In 2004 there were eight wholesale customers. The load composition of the wholesale class is a mix of residential, commercial, and industrial customers, which makes it to a large extent sensitive to population growth trends. Statistical analysis performed on temperature normalized historical consumption data was used to model the relationship between the population levels and the consumption in this class.

The energy sales for 2005 are further adjusted in order to take into account the strong growth in customers that FortisBC has been experiencing in 2004. It is expected that the sales growth in this class will return to the long term rate driven by the population growth by 2009.

2.5 Irrigation and Lighting

Due to limited data being available regarding acreage, crop types and energy use patterns, irrigation load was estimated as a five-year average at 47 GW.h and assumed constant for the duration of the forecast period. Lighting loads are estimated at 10 GW.h and also assumed constant for the whole forecast period.

3 System Losses

System losses consist primarily of:

1. losses in the transmission and distribution system
2. Company use
3. losses due to wheeling through BC Hydro system

Historically, losses have consistently amounted to about 12% of the net system sales.

4 Temperature Normalization

In order to forecast temperature sensitive loads it is necessary to eliminate the contribution of temperature to load growth prior to performing any statistical analyses leading to conclusions about the load growth. This is accomplished through temperature normalization where temperature sensitive loads are adjusted to correspond to a reference temperature of choice. The 2005 forecast is based on 20-year average temperatures which are referred to as the 'normal temperatures'. Loads that are temperature sensitive are the residential, general service and wholesale loads.

Due to the lack of reliable historical data, it was unfortunately not possible to observe and model the temperature dependency for the general service class. Instead, actual data recorded for this class was used in the analysis.

The temperature normalization model consists of sensitivity factors that correspond to Heating Degree Days (HDD) and Cooling Degree Days (CDD)[1] obtained from historical temperature data acquired from Environment Canada. In the case of the residential class, the historical data also needed to be adjusted for the bi-monthly billing cycle.

5 Peak Demand

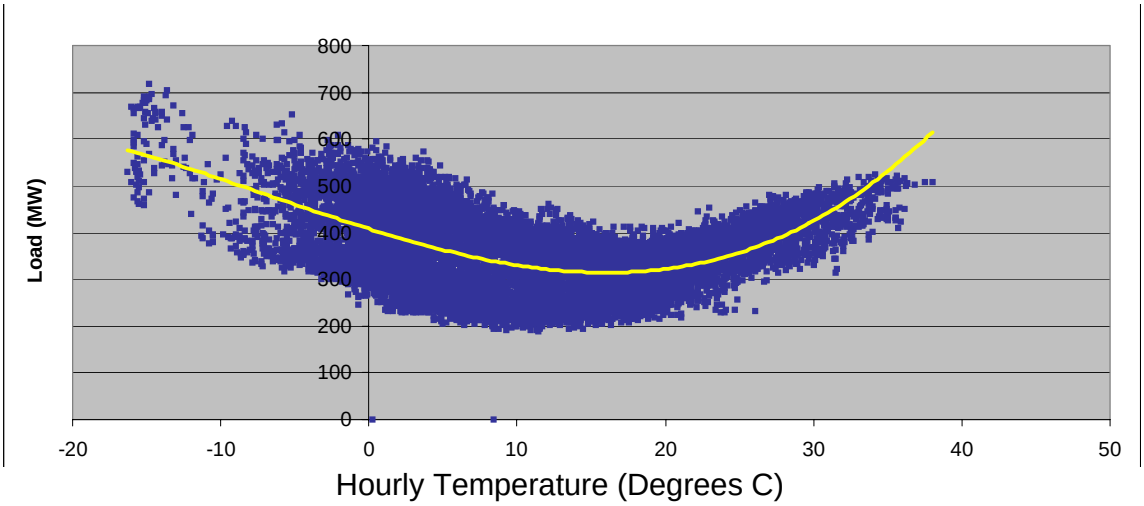
The 2005 peak demand forecast represents a forecast of the system peak demands based on the 20-year normal temperature conditions. The forecast contains 2 types of system peaks: the expected monthly winter peak and the expected annual winter peak. The expected monthly winter peak corresponds to an expected monthly low winter temperature while the expected annual winter peak corresponds to an expected annual low temperature.[2] The expected annual peak is higher because the expected annual winter temperature is colder than the expected monthly temperature.

The system load is temperature sensitive as a result of the combined temperature sensitivity of the component load classes. The following graph illustrates the non-linear nature of the relationship between load and temperature.

[1] The concept of Heating and Cooling Degree Days involves a threshold temperature. HDD is calculated as the difference between the threshold and a daily mean temperature for temperatures lower than the threshold, multiplied by the number of days. CDD is calculated in an analogous manner for daily mean temperatures greater than the threshold. The threshold temperature used is 18 degrees C.

[2] The expected monthly low temperature is an average of the coldest daily mean temperatures for each month over a period of 20 years. The expected annual winter temperature is an average of the coldest daily temperatures on an annual basis over a period of 20 years.

Graph 7.5.1
System Load as a Function of Hourly Temperature



In the winter, as temperature decreases, the load increases. In the summer time the opposite is true. The following table provides average monthly temperature sensitivity factors in MW per degree Celsius.

Table 7.5.2

Month	Temperature Sensitivity (MW/Deg C)
January	-9.0
February	-9.1
March	-7.0
April	-5.0
May	-1.5
June	4.3
July	9.4
August	7.2
September	1.6
October	-3.6
November	-9.3
December	-9.6

The sensitivity factors can be interpreted as a slope on the trend line shown on the graph corresponding to the average daily temperature in a given month. The comparable sensitivity in Winter and in Summer is indicative of electricity still being used as a primary source of energy in both seasons.

The forecast is produced based on the known non-linear relationship between load and temperature and corrected to correspond to the 20 year normal temperatures.

The forecast expected annual peak values include the contribution of Celgar of 16 MW for the duration of the whole forecast period.

6 Appendix A

Table 7.6.1
Actual and Forecast Energy Sales by Customer Class Including DSM

		Actual				Normalized				Forecast	
Sales (GWh)	**2000**	**2001**	**2002**	**2003**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Residential	978	986	997	1,013	968	1,000	1,010	1,030	1,049	1,064
General Service	498	514	517	520	498	514	517	520	551	570
Wholesale	873	881	878	907	863	883	877	911	943	964
Industrial	279	323	347	337	290	335	363	337	339	343
Lighting	12	10	10	10	12	10	10	10	10	10
Irrigation	43	43	47	52	43	43	54	52	47	47
Net Load	2,682	2,733	2,791	2,839	2,675	2,785	2,832	2,859	2,939	2,999
Losses	310	293	330	343	309	301	342	349	361	369
Losses %	11.6%	10.7%	11.8%	12.1%	11.6%	10.8%	12.1%	12.2%	12.3%	12.3%
Gross Load	2,992	3,026	3,121	3,182	2,984	3,086	3,174	3,209	3,300	3,368
System Peak Expected Annual Winter Peak (MW)	614	570	577	610	650	698	647	680	700	712

Table 7.6.2
Percent Annual Change by Customer Class

	Actual				Normalized				Forecast	
Customer Class	**2000**	**2001**	**2002**	**2003**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Residential		0.8%	1.1%	1.6%		3.2%	1.1%	2.0%	1.8%	1.5%
General Service		3.2%	0.6%	0.6%		3.2%	0.6%	0.6%	6.0%	3.4%
Wholesale		0.9%	-0.4%	3.3%		2.2%	-0.6%	3.8%	3.5%	2.2%
Industrial		15.8%	7.4%	-2.9%		15.7%	8.2%	-7.3%	0.6%	1.4%
Lighting		-16.7%	0.0%	0.0%		-16.7%	1.1%	-1.6%	3.0%	0.0%
Irrigation		0.0%	9.3%	10.6%		0.0%	26.1%	-4.5%	-8.4%	0.0%
Net Load		1.9%	2.1%	1.7%		4.1%	1.7%	1.0%	2.8%	2.0%
Losses		-5.5%	12.6%	3.9%		-2.6%	13.6%	2.1%	3.5%	2.0%
Gross Load		1.1%	3.1%	2.0%		3.4%	2.8%	1.1%	2.9%	2.0%
Expected Annual Winter Peak						7.3%	-7.3%	5.1%	2.9%	1.9%

Table 7.6.3

Actual and Forecast Year End Customer Count

		Actual				Forecast	
Customer Class	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Residential	78,008	79,121	80,421	82,174	84,076	85,926
General Service	8,700	8,974	9,153	9,433	9,929	10,306
Wholesale	8	8	8	8	8	8
Industrial	34	37	37	38	40	40
Other	933	932	1,099	1,100	1,100	1,100
Total	87,683	89,072	90,718	92,753	95,153	97,380
Customer Account Growth		1,389	1,646	2,035	2,400	2,227

Table 7.6.4

Percent Annual Change by Customer Class

	Actual				Forecast	
Customer Class	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Residential		1.4%	1.6%	2.2%	2.3%	2.2%
General Service		3.1%	2.0%	3.1%	5.3%	3.8%
Wholesale		0.0%	0.0%	0.0%	0.0%	0.0%
Industrial		8.8%	0.0%	2.7%	5.3%	0.0%
Other		-0.1%	17.9%	0.1%	0.0%	0.0%
Total		1.6%	1.8%	2.2%	2.6%	2.3%