

FortisBC Inc.
2005 Revenue Requirements Application,
2005-2024 System Development Plan and 2005 Resource Plan

40.0 Reference: Volume 1, Tab 7.1, p. 4

FortisBC forecasts the number of residential accounts using the BC Stats population forecast and a linear regression algorithm. The number of forecast residential accounts is further adjusted in order to take account of the strong growth that FortisBC experienced in 2004.

Q40.1 Please provide the BC Stats forecast data and the linear regression algorithm used. Please provide the plot(s) of the data used.

A40.1 Please refer to attachment BCUC A38.2

Q40.2 Please summarize the incremental impact of each input variable to the Residential forecast.

A40.2 As shown in attachment BCUC A38.2, the individual annual growth rates were established through a regression against time. The ratio of the annual rate of account additions and the annual rate of the population growth provides the average annual rate of account additions per capita.

Q40.3 Please provide the initial residential account forecast based on the regression and the adjusted increase in this forecast as based on the 2004 growth rate.

A40.3 Please refer to attachment BCUC A38.2

Q40.4 Please describe the process used to make the adjustment.

A40.4 Please see the response to BCUC IR1 Q38.1.

Q40.5 Does the adjustment apply for all years between 2005 and 2009 inclusive?

A40.5 The adjustments were applied to 2005 to 2008, inclusive.

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41.0 Reference: Volume 1, Tab 7.1, p. 4

FortisBC determines Residential Use per Customer based on a 25-year average annual decline rate of 67 kWh/customer.

Q41.1 Please provide the data and method used to determine the average annual decline rate.

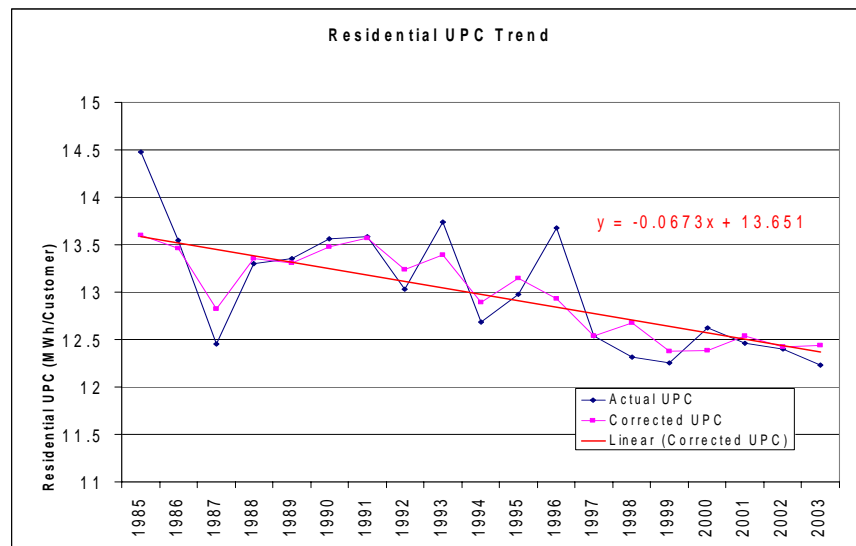
A41.1 Please refer to the attachment BCUC A41.1. The decline rate of 67 kWh/year was determined based on temperature corrected UPC data from 1985 until 2003. The slope of the trend line fitted through the actual data defines the decline rate. This effectively makes it a 19-year average annual decline rate and not the 25 year rate as originally stated in the application.

Q41.2 Please provide an indication of the relative magnitude, impact or sensitivity of this decline rate in the context of other aspects of the load forecast.

A41.2 Please refer to attachment BCUC A41.1. An increase in residential UPC would result in 1.1 percent higher energy consumption within the Residential class and 0.36 percent higher net system sales, for the duration of the forecast period.

Q41.3 Both the actual and normalized Use Per Customer graphs show some evidence of bottoming out. Was this possibility considered in the forecasts? Why or why not?

A41.3 Please refer to the graph in the attachment BCUC A41.1 which is reproduced below. The graph does show the evidence of bottoming out in 2003. It also shows similar behaviour in 1998, 1995, 1993 and 1991. At this time we did not have a reason to believe that the bottom-out effect observed in 2003 represents a lasting effect. The average decline rate takes into account periodic flattening (or even reversal) of the decline rate that occurred in the past.



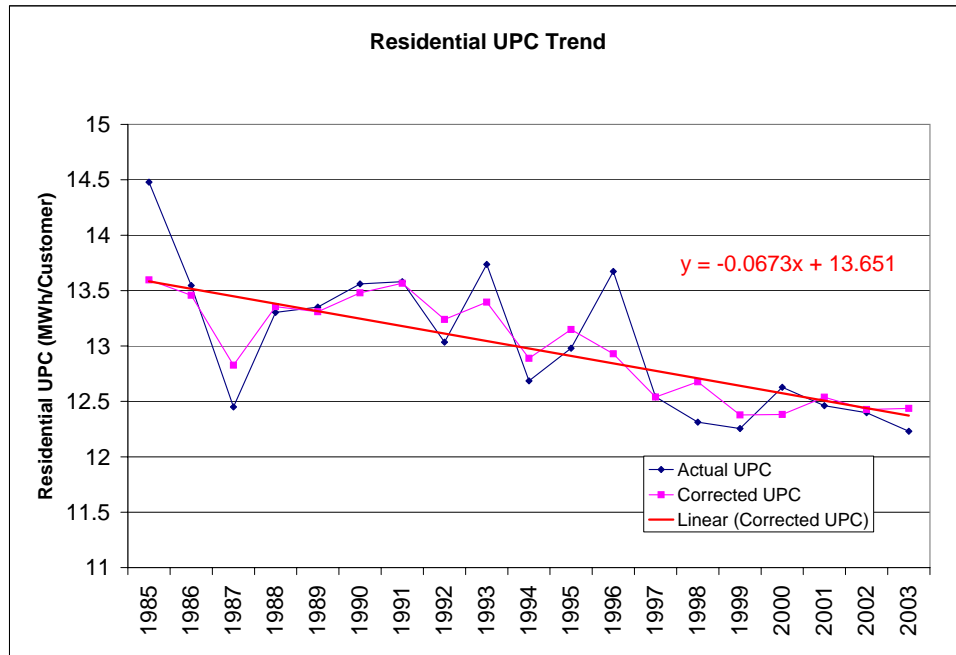
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Q41.4 If UPC does not decline, what is the impact on the overall load forecast?

A41.4 Based on 86,000 customers in 2005, sales would be 6 GW.h higher.

BCUC A41.1

Year	CDD	HDD	CDDNorm	HddNorm	Actual UPC	Corrected UPC	Non-declining UPC	UPC increased by 1%	Residential Accounts	Residential Load With Declining Rate	Residential Load with Constant Rate	residential Load with the UPC at +1%	Net SystemLoad
1985	254.3	4004.1	150.943026	3327.5893	14.47821644	13.60	13.60						
1986	231.7	3381.7	150.943026	3327.5893	13.54592105	13.46	13.46						
1987	248.1	3011.7	150.943026	3327.5893	12.45011556	12.83	12.83						
1988	205.6	3275.2	150.943026	3327.5893	13.30258004	13.36	13.36						
1989	202	3351	150.943026	3327.5893	13.35087933	13.31	13.31						
1990	266.9	3369	150.943026	3327.5893	13.5599373	13.48	13.48						
1991	210	3328	150.943026	3327.5893	13.58106589	13.57	13.57						
1992	310	3135	150.943026	3327.5893	13.0345843	13.24	13.24						
1993	140	3599	150.943026	3327.5893	13.73687784	13.40	13.40						
1994	269	3144	150.943026	3327.5893	12.68534563	12.89	12.89						
1995	196	3186	150.943026	3327.5893	12.97971995	13.15	13.15						
1996	190.1	3908.6	150.943026	3327.5893	13.67355918	12.93	12.93						
1997	170	3325	150.943026	3327.5893	12.54082259	12.54	12.54						
1998	371	2998	150.943026	3327.5893	12.31251641	12.68	12.68						
1999	193	3222	150.943026	3327.5893	12.25416013	12.38	12.38						
2000	191.4	3513.85	150.943026	3327.5893	12.62691006	12.38	12.38						
2001	234.55	3251.55	150.943026	3327.5893	12.46192541	12.54	12.54						
2002	278.95	3279.8	150.943026	3327.5893	12.39725942	12.43	12.43						
2003	369.5	3122.9	150.943026	3327.5893	12.23014579	12.44	12.44						
2004						12.47	12.47	12.60	84076	1048595.0	1048595.0	1059081.0	2938720.73
2005						12.40	12.47	12.53	85926	1065902.5	1071668.2	1076561.6	298776.28
2006						12.34	12.47	12.46	87645	1081345.6	1093107.5	1092159.0	303796.061
2007						12.27	12.47	12.39	89223	1094827.7	1112788.3	1105776.0	308967.631
2008						12.20	12.47	12.33	90695	1106804.6	1131147.1	1117872.6	3087979.11
2009						12.14	12.47	12.26	92101	1117782.8	1148682.7	1128960.7	3113921.877
2010						12.07	12.47	12.19	93597	1129658.7	1167340.8	1140955.3	3142220.968
2011						12.00	12.47	12.12	95144	1141945.8	1186635.0	1153365.3	3171826.464
2012						11.94	12.47	12.05	96727	1154455.1	1206378.1	1165999.6	3202317.758
2013						11.87	12.47	11.99	98370	1167464.0	1226869.6	1179138.6	3234351.731
2014						11.80	12.47	11.92	100081	1181054.8	1248209.2	1192865.4	3270079.26
2015						11.73	12.47	11.85	101795	1194451.3	1269586.2	1206395.8	3305824.347
2016						11.67	12.47	11.78	103475	1207221.1	1290539.1	1219233.3	3340557.866
2017						11.60	12.47	11.72	105149	1219695.8	1311417.2	1231892.7	3375030.132
2018						11.53	12.47	11.65	106774	1231380.7	1331684.2	1243694.5	3408145.896
2019						11.47	12.47	11.58	108383	1242664.2	1351751.7	1255090.8	3440747.801
2020						11.40	12.47	11.51	109974	1253526.5	1371594.6	1266061.8	3472802.875
2021						11.33	12.47	11.44	111530	1263778.7	1391001.0	1276416.5	3503866.412
2022						11.26	12.47	11.38	113103	1274013.6	1410619.4	1286753.8	3535320.043
2023						11.20	12.47	11.31	114662	1283880.7	1430063.3	1296719.5	3566331.197
Total										23460449.3	24799678.4	23695053.8	65215494.44
Average										1173022.5	1239983.9	1184752.7	
Difference											1339229.1	234604.5	
% of Residential											5.71%	1.00%	
% of net System											2.05%	0.36%	



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42.0 Reference: Volume 1, Tab 7.1, p. 5

FortisBC states that the approach used to forecast consumption in the General Service class is the same as that used for the Residential class. General service Use per Customer is predicted to increase by 26 kWh/customer annually.

Q42.1 Please provide the data and method used to determine this increase. Is this an average annual increase? Please provide the plot(s) of the data used.

A42.1 Please refer to attachment BCUC A42.1. The General Service UPC rate of 26 kWh/customer is a long term annual rate defined by the slope of the trend line shown in the graph.

Q42.2 Please provide an indication of the relative magnitude or impact of this increase in the context of other aspects of the load forecast.

A42.2 Please refer to attachment BCUC A42.1, columns C, F, and G. Assuming the constant number of General Service accounts, a 1 percent change in the General Service UPC rate would cause an increase of 0.2 percent in the energy consumed by the General Service Class during the forecast period.

Q42.3 Please provide the BC Stats forecast data and the linear regression algorithm used to forecast General Service accounts.

A42.3 Please refer to attachment BCUC A38.2.

Q42.4 Please summarize the incremental impact of each input variable to the General Service forecast as derived from the linear regression.

A42.4 Please refer to attachment BCUC A38.2. The algorithm used to determine the annual increment in General Service accounts as a function of population is consistent with the treatment of residential accounts as described in the response to BCUC IR Q40.2

Q42.5 Please provide the initial General Service account forecast based on the regression and the adjusted increase in this forecast as based on the 2004 growth rate.

A42.5 Please refer to attachment BCUC A38.2

Q42.6 If energy consumption in this class has historically been irregular because of the diversity in customer size within the class and the lumpiness of load additions, please discuss further the reasons why it is appropriate to adjust the forecast account additions based on the observed growth in 2004.

A42.6 The manual adjustment in question was performed only to make the 2005 forecast number of accounts consistent with the actual numbers recorded by mid 2004 and the projections to the end of 2004. These adjustments are not based solely on the 2004 values. In fact, the annual

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rate of account additions was gradually reduced from 2005 to 2009 when it fell in line with the long-term rate. Applying the long term rate directly to 2005 forecast would have created a sharp drop in the accounts additions which would be unreasonable in light of the actuals recorded by mid 2004. Please also see the response to BCUC IR1 Q38.1.

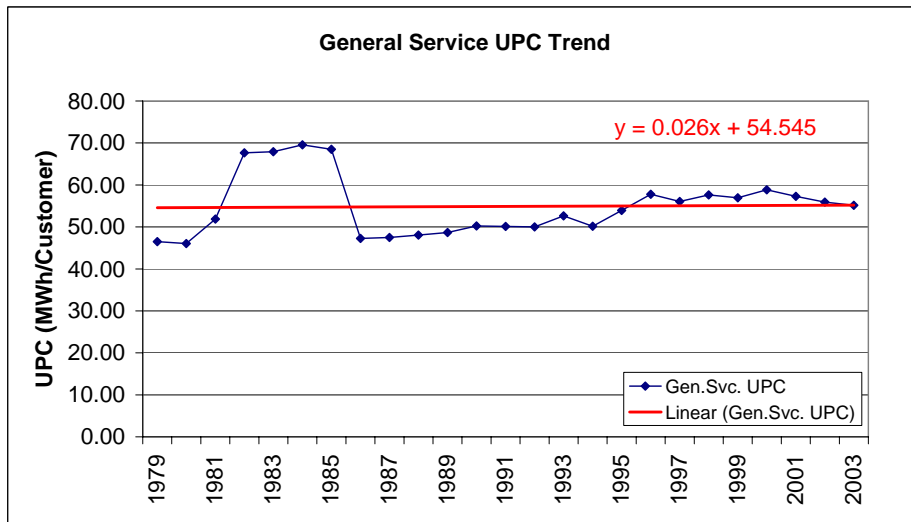
BCUC A 42.1

LONG TERM HISTORICAL FILED DATA

Year	Gen.Svc. UPC	Gen Svc UPC Increased by 1%	General Service Accounts	General Service Load (MWh)	General service load with increased UPC (MWh)	Difference (MWh)	Net Sales With DSM
1979	46.51						
1980	46.03						
1981	51.89						
1982	67.64						
1983	67.91						
1984	69.55						
1985	68.48						
1986	47.27						
1987	47.47						
1988	48.05						
1989	48.68						
1990	50.23						
1991	50.11						
1992	49.99						
1993	52.63						
1994	50.14						
1995	53.92						
1996	57.78						
1997	56.06						
1998	57.62						
1999	56.96						
2000	58.85						
2001	57.28						
2002	55.90						
2003	55.16						
2004	55.53	55.53	9929	551363.2534	551363.2534	0	2938721
2005	55.56	56.17	10306	572566.2428	578864.4715	6298.228671	2998776
2006	55.58	56.19	10564	587174.5077	593633.4273	6458.919585	3037986
2007	55.61	56.22	10754	598014.8043	604592.9671	6578.162847	3068688
2008	55.63	56.25	10915	607251.5777	613931.345	6679.767354	3087979
2009	55.66	56.27	11072	616274.0807	623053.0956	6779.014888	3113922
2010	55.69	56.30	11239	625861.6137	632746.0914	6884.47775	3142221
2011	55.71	56.33	11412	635792.1062	642785.8193	6993.713168	3171826
2012	55.74	56.35	11589	645954.549	653060.0491	7105.50004	3202318
2013	55.76	56.38	11773	656516.5481	663738.2301	7221.682029	3234352
2014	55.79	56.40	11964	667478.6493	674820.9144	7342.265142	3270079
2015	55.82	56.43	12156	678506.499	685970.0705	7463.571489	3305824
2016	55.84	56.46	12344	689320.9624	696903.493	7582.530587	3340558
2017	55.87	56.48	12531	700089.3332	707790.3159	7700.982666	3375030
2018	55.89	56.51	12713	710587.9551	718404.4226	7816.467506	3408146
2019	55.92	56.54	12893	720984.1997	728915.0259	7930.826197	3440748
2020	55.95	56.56	13071	731277.9112	739321.9682	8044.057023	3472803
2021	55.97	56.59	13245	741356.9883	749511.9152	8154.926871	3503866
2022	56.00	56.61	13421	751557.1106	759824.2388	8267.128217	3535320
2023	56.02	56.64	13595	761654.3357	770032.5334	8378.197693	3566331

Total 139680.4197 **65215494.44**
Average 6984.020986 **3260774.722**

Percentage of Net Sales 0.002141829



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43.0 Reference: Volume 1, Tab 7.1, p. 5

“The rest of the load industrial class (*sic*) 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.”

Q43.1 Is industrial sector load forecast to grow at the above-long-term rates associated with 2004’s residential load growth during the period 2005 to 2009?

A43.1 Since a portion of industrial sales are in the long run forecast to grow in fixed proportion to system sales, this is correct.

Q43.2 If the industrial load was determined based on the historical relationship between load and net system load, why is it projected to grow at slightly less than the system sales growth rate?

A43.2 The examination of historical data from 1998 to 2003 indicates that this portion of industrial load has an annual growth rate slightly below the net system load rate. This analysis excluded the 2001 data as an outlier. Please see table below.

The 2004 forecast was calculated as a three year historic average. For 2005 and beyond this portion of load was increased at an average rate of 1.9 percent which is a 2001-2003 net system growth rate reduced by 0.4 percent. In the absence of any other information regarding this portion of load this rate was held constant for the duration of the forecast period.

	Industrial Excluding Celgar (MWh)	Industrial Growth Rate	Net System Sales (MWh)	Net System Load Growth Rate	
	197309.42		2532007		
1998	179239.148	0.908416577	2533158	1.00045458	
1999	186464.256	1.040309877	2607386	1.029302554	
2000	197780	1.060685861	2674613.874	1.025783629	
2001	265975.1	1.344802811	2784510.07	1.041088621	excluded as outlier
2002	276313.359	1.038869274	2831570.967	1.016900961	
2003	278478.725	1.007836632	2859484.224	1.00985787	
2004	273589.0613	0.982441518	2938720.73	1.027710069	FORECAST
2005	278898.815	1.01940777	2998776.28	1.02043595	FORECAST
	Growth rate	1.011		1.016	

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44.0 Reference: Volume 1, Tab 7.1, p. 6

Q44.1 Please provide the data and statistical analysis used to model the relationship between population levels and consumption in the Wholesale class. Please provide the plot(s) of the data used.

A44.1 Please refer to attachment BCUC A38.2, page "Wholesale".

Q44.2 Please provide the adjusted increase to the Wholesale load forecast that accounts for the growth in customers that FortisBC has been experiencing in 2004.

A44.2 Please refer to attachment BCUC A38.2

Q44.3 Do the adjustments apply to all years from 2005 through 2009?

A44.3 The adjustments apply to 2004 to 2008, inclusive.

Q44.4 How were the adjustments made?

A44.4 The method used to establish the relationship between the wholesale energy and population is consistent with that used to establish the relationship between UPC and population for Residential and General Service class, as described in the response to BCUC IR1 Q38.1.

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Q45.0 Reference: Volume 1, Tab 7.1, p. 6

System losses typically amount to about 12 percent of net system sales.

Will the recent and near-future transmission upgrades have a material effect on system losses?

A45.0 The recent and near-future transmission upgrades are forecast to reduce the transmission system losses. A reduction was applied to the load forecast in 2006 to reflect the reduced losses due to the addition of the Vaseux Lake substation.

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Q46.0 Reference: Volume 1, Tab 7.1, p. 7

“In the case of the residential class, the historical data also needed to be adjusted for the bi-monthly billing cycle.”

Please describe the adjustment process and provide the data upon which it was derived.

A46.0 The Residential class is subject to a bi-monthly billing cycle. The billing cycle adjustment was applied to the Heating and Cooling Degree Days and has the following form:

$$\mathbf{BCDD(m) = 0.25* DD(m-2) + 0.5*DD(m-1) + 0.25*DD(m)}$$

Where:

BCDD(m) = Billing cycle corrected Heating or Cooling Degree Days in a given month

DD(m-2) = Heating or Cooling Degree Days two months prior to the month of interest

DD(m-1) = Heating or Cooling Degree Days in a month prior to the month of interest

DD(m) = Heating or Cooling Degree Days in the month of interest

Subsequently, the adjusted degree days were correlated to the energy sales for this class recorded for each month.

For data, please refer to attachment BCUC A48.1.

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47.0 Reference: Volume 1, Tab 7.1

Q47.1 Did FortisBC segment any elements of its load forecast by service regions? If so, please provide the results of this approach.

A47.1 The 2005 Load Forecast was broken down by the following geographical areas:

- Trail
- Castlegar
- Grand Forks
- Creston
- Kelowna
- Oliver
- Penticton

For each of the areas, the forecast was further broken down by a rate class.

The area breakdown was based on a recent area load breakdown produced internally by FortisBC prior to the 2005 load forecast. Please refer to attachment BCUC A47.1

Q47.2 Further to the preceding question, if not, why not? Would FortisBC expect there to be any differences by region, and any incremental benefit to building a composite load forecast based on regional analysis? Please discuss.

A47.2 Please refer to attachment BCUC A47.1, pages “Percent” and “Summary_By_Area”. The differences between loads in different geographic areas exist not only in terms of the total amount of load but also in terms of the rate class mix.

BCUC A47.1

	TRAIL	CASTLEGAR	GRAND FORKS	CRESTON	KELOWNA	OLIVER	PENTICTON
Area Percent of Net System Energy	7.96%	15.14%	7.00%	4.83%	35.54%	6.30%	23.22%
General Service	28.47%	13.89%	8.56%	23.24%	23.24%	29.65%	4.28%
Industrial	15.80%	31.37%	38.03%	13.00%	13.00%	4.08%	7.34%
Irrigation	0.11%	0.10%	3.39%	0.60%	0.60%	11.33%	2.37%
Lighting	1.04%	0.38%	0.32%	0.44%	0.44%	0.53%	0.10%
Residential	54.59%	31.63%	31.96%	61.22%	61.22%	54.40%	17.43%
Wholesale		22.63%	17.75%	1.51%	1.51%		68.49%

BCUC A47.1

Annual MWh Including DSM

Year	Year Num	TRAIL	CASTLEGAR	RAND FORKS	CRESTON	KELOWNA	OLIVER	PENTICTON	Net System Load
2004	1	234,032	444,807	205,819	141,969	1,044,437	185,151	682,506	2,938,721
2005	2	238,814	453,897	210,025	144,871	1,065,781	188,935	696,453	2,998,776
2006	3	241,937	459,832	212,771	146,765	1,079,716	191,405	705,560	3,037,986
2007	4	244,382	464,479	214,921	148,248	1,090,627	193,340	712,690	3,068,688
2008	5	245,918	467,399	216,272	149,180	1,097,484	194,555	717,170	3,087,979
2009	6	247,984	471,326	218,089	150,433	1,106,704	196,190	723,195	3,113,922
2010	7	250,238	475,609	220,071	151,800	1,116,762	197,973	729,768	3,142,221
2011	8	252,596	480,090	222,145	153,231	1,127,284	199,838	736,643	3,171,826
2012	9	255,024	484,706	224,280	154,704	1,138,120	201,759	743,725	3,202,318
2013	10	257,575	489,554	226,524	156,251	1,149,505	203,777	751,165	3,234,352
2014	11	260,420	494,962	229,026	157,977	1,162,203	206,028	759,462	3,270,079
2015	12	263,267	500,372	231,530	159,704	1,174,907	208,280	767,764	3,305,824
2016	13	266,033	505,630	233,962	161,382	1,187,252	210,469	775,831	3,340,558
2017	14	268,778	510,848	236,377	163,047	1,199,503	212,641	783,837	3,375,030
2018	15	271,415	515,860	238,696	164,647	1,211,273	214,727	791,528	3,408,146
2019	16	274,012	520,795	240,979	166,222	1,222,860	216,781	799,099	3,440,748
2020	17	276,565	525,646	243,224	167,771	1,234,252	218,801	806,544	3,472,803
2021	18	279,038	530,348	245,400	169,271	1,245,292	220,758	813,758	3,503,866
2022	19	281,543	535,109	247,603	170,791	1,256,471	222,740	821,063	3,535,320
2023	20	284,013	539,803	249,775	172,289	1,267,493	224,693	828,266	3,566,331

Monthly MWh Including DSM

Year	Month	TRAIL	CASTLEGAR	RAND FORKS	CRESTON	KELOWNA	OLIVER	PENTICTON	Net System Load
2004	1	23,905	45,435	21,023	14,501	106,684	18,912	69,715	300,176
2004	2	22,427	42,625	19,723	13,605	100,087	17,743	65,403	281,613
2004	3	21,830	41,490	19,198	13,242	97,421	17,270	63,662	274,113
2004	4	19,956	37,929	17,550	12,106	89,059	15,788	58,197	250,586
2004	5	18,971	36,056	16,684	11,508	84,662	15,008	55,324	238,212
2004	6	16,909	32,138	14,871	10,258	75,463	13,378	49,313	212,330
2004	7	16,572	31,497	14,574	10,053	73,958	13,111	48,329	208,094
2004	8	18,345	34,867	16,134	11,129	81,871	14,514	53,500	230,359
2004	9	18,624	35,398	16,379	11,298	83,116	14,734	54,313	233,862
2004	10	17,668	33,580	15,538	10,718	78,849	13,978	51,525	221,856
2004	11	17,983	34,179	15,815	10,909	80,254	14,227	52,444	225,811
2004	12	20,842	39,612	18,329	12,643	93,013	16,489	60,781	261,709
2005	1	24,344	46,268	21,409	14,767	108,640	19,259	70,993	305,680
2005	2	22,858	43,445	20,103	13,866	102,013	18,084	66,662	287,032
2005	3	22,252	42,293	19,570	13,499	99,306	17,604	64,894	279,417
2005	4	20,373	38,721	17,917	12,359	90,920	16,118	59,413	255,820
2005	5	19,381	36,835	17,044	11,757	86,492	15,333	56,520	243,361
2005	6	17,315	32,909	15,227	10,503	77,272	13,698	50,495	217,419
2005	7	16,979	32,270	14,932	10,300	75,773	13,433	49,515	213,201
2005	8	18,746	35,630	16,486	11,372	83,661	14,831	54,669	235,395
2005	9	19,007	36,125	16,715	11,530	84,823	15,037	55,429	238,665
2005	10	18,035	34,279	15,861	10,941	80,489	14,269	52,597	226,470
2005	11	18,341	34,860	16,130	11,126	81,852	14,510	53,488	230,307
2005	12	21,184	40,263	18,630	12,851	94,540	16,760	61,779	266,007
2006	1	24,588	46,733	21,624	14,916	109,733	19,453	71,707	308,755
2006	2	23,116	43,934	20,329	14,023	103,161	18,288	67,412	290,262
2006	3	22,504	42,771	19,791	13,651	100,429	17,803	65,627	282,577
2006	4	20,633	39,215	18,145	12,516	92,080	16,323	60,171	259,084
2006	5	19,642	37,333	17,274	11,915	87,660	15,540	57,283	246,647
2006	6	17,581	33,416	15,462	10,665	78,462	13,909	51,272	220,767
2006	7	17,260	32,805	15,179	10,470	77,029	13,655	50,336	216,735
2006	8	19,028	36,164	16,734	11,543	84,916	15,053	55,490	238,928
2006	9	19,271	36,627	16,948	11,690	86,002	15,246	56,199	241,983
2006	10	18,291	34,763	16,086	11,095	81,627	14,470	53,341	229,673
2006	11	18,594	35,340	16,353	11,280	82,982	14,711	54,226	233,485
2006	12	21,430	40,730	18,846	13,000	95,636	16,954	62,495	269,090
2007	1	24,778	47,093	21,791	15,031	110,579	19,603	72,260	311,134
2007	2	23,317	44,317	20,506	14,145	104,060	18,447	68,000	292,792
2007	3	22,699	43,143	19,963	13,770	101,303	17,958	66,198	285,035
2007	4	20,837	39,603	18,325	12,640	92,990	16,485	60,766	261,645
2007	5	19,848	37,723	17,455	12,040	88,577	15,702	57,882	249,227
2007	6	17,792	33,816	15,647	10,793	79,402	14,076	51,886	223,411
2007	7	17,485	33,233	15,378	10,607	78,034	13,833	50,993	219,563
2007	8	19,253	36,592	16,932	11,679	85,920	15,231	56,146	241,753
2007	9	19,478	37,021	17,130	11,816	86,927	15,410	56,804	244,587
2007	10	18,488	35,139	16,259	11,215	82,509	14,627	53,917	232,154
2007	11	18,790	35,712	16,525	11,398	83,855	14,865	54,796	235,941
2007	12	21,617	41,086	19,011	13,114	96,473	17,102	63,042	271,446
2008	1	24,800	47,135	21,810	15,044	110,675	19,620	72,323	311,406
2008	2	23,305	44,294	20,496	14,137	104,006	18,438	67,965	292,641
2008	3	22,770	43,278	20,025	13,813	101,619	18,014	66,405	285,925
2008	4	20,784	39,504	18,279	12,608	92,757	16,443	60,614	260,989
2008	5	19,827	37,683	17,437	12,027	88,483	15,686	57,821	248,963
2008	6	17,807	33,845	15,661	10,802	79,471	14,088	51,931	223,606
2008	7	17,671	33,586	15,541	10,720	78,861	13,980	51,533	221,891
2008	8	19,476	37,017	17,128	11,815	86,917	15,408	56,798	244,559
2008	9	19,485	37,034	17,136	11,820	86,959	15,416	56,825	244,675
2008	10	18,767	35,669	16,505	11,384	83,753	14,847	54,730	235,656
2008	11	19,184	36,461	16,871	11,637	85,613	15,177	55,945	240,887

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2008	12	22,042	41,894	19,385	13,371	98,369	17,438	64,281	276,780
2009	1	24,972	47,462	21,961	15,148	111,444	19,756	72,825	313,568
2009	2	23,477	44,622	20,647	14,242	104,775	18,574	68,467	294,803
2009	3	22,942	43,605	20,177	13,917	102,387	18,151	66,907	288,086
2009	4	20,957	39,831	18,430	12,713	93,525	16,580	61,116	263,151
2009	5	19,999	38,011	17,588	12,132	89,251	15,822	58,323	251,125
2009	6	17,980	34,172	15,812	10,907	80,239	14,224	52,434	225,768
2009	7	17,843	33,913	15,692	10,824	79,630	14,116	52,035	224,053
2009	8	19,648	37,344	17,280	11,919	87,686	15,544	57,300	246,721
2009	9	19,657	37,362	17,288	11,925	87,727	15,552	57,327	246,837
2009	10	18,939	35,996	16,656	11,489	84,522	14,983	55,232	237,817
2009	11	19,356	36,788	17,022	11,742	86,381	15,313	56,447	243,049
2009	12	22,214	42,221	19,536	13,476	99,137	17,574	64,783	278,942
2010	1	25,160	47,819	22,127	15,262	112,282	19,905	73,373	315,927
2010	2	23,665	44,979	20,812	14,356	105,613	18,722	69,015	297,162
2010	3	23,130	43,962	20,342	14,031	103,226	18,299	67,455	290,445
2010	4	21,144	40,188	18,595	12,827	94,363	16,728	61,663	265,509
2010	5	20,187	38,368	17,753	12,246	90,089	15,970	58,871	253,484
2010	6	18,167	34,529	15,977	11,021	81,077	14,373	52,981	228,126
2010	7	18,031	34,270	15,857	10,938	80,468	14,265	52,583	226,412
2010	8	19,836	37,701	17,445	12,033	88,524	15,693	57,848	249,079
2010	9	19,845	37,718	17,453	12,039	88,565	15,700	57,875	249,196
2010	10	19,127	36,353	16,821	11,603	85,360	15,132	55,780	240,176
2010	11	19,544	37,145	17,188	11,856	87,219	15,462	56,995	245,407
2010	12	22,402	42,578	19,701	13,590	99,976	17,723	65,331	281,300
2011	1	25,356	48,192	22,299	15,382	113,159	20,060	73,946	318,394
2011	2	23,862	45,352	20,985	14,475	106,490	18,878	69,588	299,629
2011	3	23,327	44,335	20,515	14,151	104,102	18,455	68,028	292,912
2011	4	21,341	40,561	18,768	12,946	95,240	16,884	62,236	267,976
2011	5	20,383	38,741	17,926	12,365	90,966	16,126	59,443	255,951
2011	6	18,364	34,903	16,150	11,140	81,954	14,528	53,554	230,593
2011	7	18,227	34,643	16,030	11,057	81,345	14,420	53,156	228,879
2011	8	20,032	38,074	17,618	12,152	89,401	15,848	58,421	251,546
2011	9	20,042	38,092	17,626	12,158	89,442	15,856	58,448	251,663
2011	10	19,323	36,727	16,994	11,722	86,237	15,287	56,353	242,643
2011	11	19,740	37,518	17,360	11,975	88,096	15,617	57,568	247,874
2011	12	22,598	42,951	19,874	13,709	100,852	17,878	65,904	283,767
2012	1	25,558	48,577	22,477	15,504	114,062	20,220	74,536	320,935
2012	2	24,064	45,737	21,163	14,598	107,393	19,038	70,178	302,170
2012	3	23,529	44,720	20,693	14,273	105,005	18,615	68,618	295,453
2012	4	21,543	40,946	18,946	13,069	96,143	17,044	62,827	270,517
2012	5	20,586	39,126	18,104	12,488	91,869	16,286	60,034	258,492
2012	6	18,566	35,287	16,328	11,263	82,857	14,688	54,144	233,134
2012	7	18,430	35,028	16,208	11,180	82,248	14,580	53,746	231,420
2012	8	20,235	38,459	17,795	12,275	90,304	16,009	59,011	254,087
2012	9	20,244	38,476	17,804	12,281	90,345	16,016	59,038	254,204
2012	10	19,526	37,111	17,172	11,845	87,140	15,448	56,943	245,184
2012	11	19,942	37,903	17,538	12,098	88,999	15,777	58,158	250,415
2012	12	22,801	43,336	20,052	13,832	101,755	18,039	66,494	286,308
2013	1	25,771	48,981	22,664	15,633	115,011	20,388	75,156	323,604
2013	2	24,277	46,141	21,350	14,727	108,341	19,206	70,798	304,839
2013	3	23,742	45,124	20,880	14,402	105,954	18,783	69,238	298,122
2013	4	21,756	41,350	19,133	13,198	97,092	17,212	63,447	273,187
2013	5	20,798	39,530	18,291	12,617	92,818	16,454	60,654	261,161
2013	6	18,779	35,691	16,515	11,392	83,806	14,857	54,764	235,803
2013	7	18,642	35,432	16,395	11,309	83,197	14,749	54,366	234,089
2013	8	20,447	38,863	17,982	12,404	91,253	16,177	59,631	256,757
2013	9	20,457	38,881	17,991	12,410	91,294	16,184	59,658	256,873
2013	10	19,738	37,515	17,359	11,974	88,088	15,616	57,563	247,853
2013	11	20,155	38,307	17,725	12,227	89,948	15,945	58,778	253,085
2013	12	23,013	43,740	20,239	13,960	102,704	18,207	67,114	288,978
2014	1	26,008	49,432	22,873	15,777	116,069	20,576	75,847	326,581
2014	2	24,514	46,591	21,559	14,871	109,400	19,394	71,489	307,816
2014	3	23,979	45,575	21,088	14,546	107,012	18,970	69,929	301,100
2014	4	21,993	41,800	19,342	13,341	98,150	17,399	64,138	276,164
2014	5	21,035	39,980	18,499	12,760	93,876	16,642	61,345	264,138
2014	6	19,016	36,142	16,723	11,535	84,864	15,044	55,456	238,781
2014	7	18,879	35,883	16,603	11,453	84,255	14,936	55,058	237,066
2014	8	20,684	39,314	18,191	12,548	92,311	16,364	60,322	259,734
2014	9	20,694	39,331	18,199	12,553	92,352	16,372	60,349	259,850
2014	10	19,975	37,966	17,567	12,118	89,146	15,803	58,254	250,831
2014	11	20,392	38,758	17,934	12,370	91,006	16,133	59,469	256,062
2014	12	23,251	44,191	20,448	14,104	103,762	18,394	67,805	291,955
2015	1	26,245	49,883	23,081	15,921	117,127	20,764	76,539	329,560
2015	2	24,751	47,042	21,767	15,014	110,458	19,581	72,181	310,795
2015	3	24,216	46,026	21,297	14,690	108,071	19,158	70,621	304,078
2015	4	22,230	42,251	19,550	13,485	99,209	17,587	64,830	279,143
2015	5	21,272	40,431	18,708	12,904	94,935	16,829	62,037	267,117
2015	6	19,253	36,593	16,932	11,679	85,923	15,232	56,148	241,759
2015	7	19,117	36,333	16,812	11,597	85,313	15,124	55,750	240,045
2015	8	20,922	39,764	18,400	12,692	93,369	16,552	61,014	262,713
2015	9	20,931	39,782	18,408	12,697	93,411	16,559	61,041	262,829
2015	10	20,213	38,417	17,776	12,261	90,205	15,991	58,946	253,809
2015	11	20,629	39,209	18,142	12,514	92,065	16,321	60,161	259,041
2015	12	23,488	44,641	20,656	14,248	104,821	18,582	68,497	294,934
2016	1	26,476	50,321	23,284	16,061	118,156	20,946	77,211	332,455
2016	2	24,981	47,480	21,970	15,154	111,487	19,764	72,853	313,690
2016	3	24,446	46,464	21,499	14,830	109,100	19,341	71,293	306,973
2016	4	22,461	42,689	19,753	13,625	100,238	17,769	65,502	282,037
2016	5	21,503	40,869	18,911	13,044	95,964	17,012	62,709	270,012
2016	6	19,484	37,031	17,135	11,819	86,951	15,414	56,820	244,654

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2016	7	19,347	36,772	17,015	11,736	86,342	15,306	56,422	242,940
2016	8	21,152	40,203	18,602	12,831	94,398	16,734	61,686	265,607
2016	9	21,162	40,220	18,610	12,837	94,440	16,742	61,713	265,724
2016	10	20,443	38,855	17,979	12,401	91,234	16,173	59,618	256,704
2016	11	20,860	39,647	18,345	12,654	93,093	16,503	60,833	261,935
2016	12	23,718	45,080	20,859	14,388	105,850	18,764	69,169	297,828
2017	1	26,705	50,755	23,485	16,200	119,177	21,127	77,878	335,327
2017	2	25,210	47,915	22,171	15,293	112,508	19,945	73,520	316,562
2017	3	24,675	46,898	21,701	14,969	110,121	19,522	71,960	309,845
2017	4	22,689	43,124	19,954	13,764	101,259	17,950	66,169	284,910
2017	5	21,732	41,304	19,112	13,183	96,985	17,193	63,376	272,884
2017	6	19,712	37,466	17,336	11,958	87,972	15,595	57,487	247,527
2017	7	19,576	37,206	17,216	11,875	87,363	15,487	57,089	245,812
2017	8	21,381	40,637	18,803	12,970	95,419	16,915	62,353	268,480
2017	9	21,390	40,655	18,812	12,976	95,461	16,923	62,380	268,596
2017	10	20,672	39,290	18,180	12,540	92,255	16,354	60,286	259,576
2017	11	21,089	40,082	18,546	12,793	94,114	16,684	61,501	264,808
2017	12	23,947	45,514	21,060	14,527	106,871	18,945	69,837	300,701
2018	1	26,924	51,173	23,679	16,333	120,158	21,301	78,519	338,087
2018	2	25,430	48,333	22,364	15,426	113,489	20,119	74,161	319,322
2018	3	24,895	47,316	21,894	15,102	111,101	19,695	72,601	312,605
2018	4	22,909	43,542	20,147	13,897	102,239	18,124	66,810	287,670
2018	5	21,952	41,722	19,305	13,316	97,965	17,367	64,017	275,644
2018	6	19,932	37,884	17,529	12,091	88,953	15,769	58,128	250,286
2018	7	19,796	37,624	17,409	12,008	88,344	15,661	57,730	248,572
2018	8	21,601	41,055	18,997	13,104	96,400	17,089	62,994	271,239
2018	9	21,610	41,073	19,005	13,109	96,441	17,097	63,021	271,356
2018	10	20,892	39,707	18,373	12,673	93,236	16,528	60,926	262,336
2018	11	21,308	40,499	18,740	12,926	95,095	16,858	62,141	267,568
2018	12	24,167	45,932	21,253	14,660	107,852	19,119	70,477	303,461
2019	1	27,141	51,584	23,869	16,464	121,123	21,472	79,150	340,804
2019	2	25,646	48,744	22,555	15,558	114,454	20,290	74,792	322,039
2019	3	25,111	47,727	22,084	15,233	112,067	19,867	73,232	315,322
2019	4	23,126	43,953	20,338	14,029	103,205	18,296	67,441	290,387
2019	5	22,168	42,133	19,496	13,448	98,931	17,538	64,648	278,361
2019	6	20,148	38,295	17,720	12,223	89,919	15,940	58,759	253,003
2019	7	20,012	38,035	17,599	12,140	89,309	15,832	58,361	251,289
2019	8	21,817	41,466	19,187	13,235	97,365	17,260	63,625	273,956
2019	9	21,826	41,484	19,195	13,240	97,407	17,268	63,652	274,073
2019	10	21,108	40,119	18,563	12,805	94,201	16,699	61,557	265,053
2019	11	21,525	40,911	18,930	13,057	96,061	17,029	62,772	270,285
2019	12	24,383	46,343	21,444	14,791	108,817	19,290	71,108	306,178
2020	1	27,353	51,989	24,056	16,593	122,073	21,640	79,771	343,475
2020	2	25,859	49,148	22,742	15,687	115,404	20,458	75,413	324,710
2020	3	25,324	48,132	22,271	15,362	113,016	20,035	73,853	317,993
2020	4	23,338	44,357	20,525	14,158	104,154	18,464	68,061	293,058
2020	5	22,381	42,537	19,683	13,577	99,880	17,706	65,269	281,032
2020	6	20,361	38,699	17,907	12,352	90,868	16,109	59,379	255,674
2020	7	20,225	38,440	17,787	12,269	90,259	16,001	58,981	253,960
2020	8	22,030	41,871	19,374	13,364	98,315	17,429	64,246	276,628
2020	9	22,039	41,888	19,382	13,369	98,356	17,436	64,273	276,744
2020	10	21,321	40,523	18,751	12,934	95,151	16,868	62,178	267,724
2020	11	21,737	41,315	19,117	13,186	97,010	17,197	63,393	272,956
2020	12	24,596	46,748	21,631	14,920	109,766	19,459	71,729	308,849
2021	1	27,560	52,380	24,237	16,718	122,993	21,803	80,372	346,064
2021	2	26,065	49,540	22,923	15,812	116,324	20,621	76,014	327,299
2021	3	25,530	48,524	22,453	15,487	113,936	20,198	74,454	320,582
2021	4	23,544	44,749	20,706	14,283	105,074	18,627	68,663	295,646
2021	5	22,587	42,929	19,864	13,702	100,800	17,869	65,870	283,621
2021	6	20,567	39,091	18,088	12,477	91,788	16,272	59,980	258,263
2021	7	20,431	38,831	17,968	12,394	91,179	16,164	59,582	256,549
2021	8	22,236	42,262	19,555	13,489	99,235	17,592	64,847	279,216
2021	9	22,245	42,280	19,564	13,495	99,276	17,599	64,874	279,333
2021	10	21,527	40,915	18,932	13,059	96,071	17,031	62,779	270,313
2021	11	21,944	41,707	19,298	13,312	97,930	17,360	63,994	275,544
2021	12	24,802	47,139	21,812	15,046	110,686	19,622	72,330	311,437
2022	1	27,768	52,777	24,421	16,845	123,924	21,969	80,981	348,685
2022	2	26,274	49,937	23,107	15,938	117,255	20,786	76,622	329,920
2022	3	25,739	48,920	22,636	15,614	114,868	20,363	75,063	323,203
2022	4	23,753	45,146	20,890	14,409	106,006	18,792	69,271	298,268
2022	5	22,796	43,326	20,047	13,828	101,732	18,034	66,478	286,242
2022	6	20,776	39,488	18,272	12,603	92,720	16,437	60,589	260,884
2022	7	20,640	39,228	18,151	12,520	92,110	16,329	60,191	259,170
2022	8	22,445	42,659	19,739	13,616	100,166	17,757	65,456	281,837
2022	9	22,454	42,677	19,747	13,621	100,208	17,764	65,483	281,954
2022	10	21,736	41,312	19,115	13,185	97,002	17,196	63,388	272,934
2022	11	22,152	42,103	19,482	13,438	98,861	17,526	64,603	278,166
2022	12	25,011	47,536	21,996	15,172	111,618	19,787	72,939	314,059
2023	1	27,974	53,168	24,602	16,970	124,843	22,131	81,581	351,269
2023	2	26,480	50,328	23,288	16,063	118,174	20,949	77,223	332,504
2023	3	25,945	49,311	22,817	15,739	115,786	20,526	75,663	325,787
2023	4	23,959	45,537	21,071	14,534	106,924	18,955	69,872	300,852
2023	5	23,001	43,717	20,228	13,953	102,650	18,197	67,079	288,826
2023	6	20,982	39,879	18,453	12,728	93,638	16,600	61,189	263,468
2023	7	20,845	39,619	18,332	12,645	93,029	16,492	60,791	261,754
2023	8	22,651	43,050	19,920	13,740	101,085	17,920	66,056	284,422
2023	9	22,660	43,068	19,928	13,746	101,126	17,927	66,083	284,538
2023	10	21,942	41,703	19,296	13,310	97,921	17,359	63,988	275,518
2023	11	22,358	42,495	19,663	13,563	99,780	17,688	65,203	280,750
2023	12	25,217	47,927	22,177	15,297	112,536	19,950	73,539	316,643

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48.0 Reference: Volume 1, Tab 7.1, pp. 7-8

Q48.1 Please provide the underlying analysis that demonstrates how the Residential, General Service, and Wholesale load forecasts were normalized for temperature. As part of your summary, please show the amount and percentage of load not affected by temperature variations.

A48.1 Please refer to attachment BCUC A48.1.

Also, please note that the temperature normalization was carried out for the Residential and Wholesale class only. Due to insufficient data it was not possible to reliably normalize General Service data and hence the data for this class was used in the forecast in its actual form.

The type of load that does not respond to temperature changes includes Industrial class and the category of load classified as 'Other'. The temperature non-responsive load forms about 12 percent of the total load.

Q48.2 Graph 7.5.1 illustrates the non-linear relationship between load and temperature. Please provide the data upon which Graph 7.5.1 is based.

A48.2 The data requested comprises of 824 pages and therefore has only been provided in spreadsheet form as BCUC A48.2.xls.

Q48.3 How is the relationship between system load as a function of hourly temperature (as opposed to, or in conjunction with, the temperature sensitivity of load by individual customer class) used in the forecasts?

A48.3 The monthly sensitivity table derived from hourly load and temperature data (see spreadsheet BCUC A48.2.xls) was used for peak normalization. The peak normalization did not require the consideration of rate classes.

Q48.4 It appears that Graph 7.5.1 does not distinguish between hour of the day or day of the week. Was the possibility that system load is more sensitive to temperature during certain hours of the day or days of the week examined? Please explain.

A48.4 It is true that the graph in Fig 7.5.1 does not differentiate between different hours of the day. However, in the forecast, the different sensitivity of the load to temperature was captured through the Heating and Cooling Degree model for energy and the monthly sensitivity table for peak normalization.

The relationship between the load and temperature depicted in Fig 7.5.1 shows primarily the effect of seasonal temperature variations on load. The stratification of data observable in the graph is very likely the result of different degrees of participation of load classes in daily consumption at different times of the day or days of the week. A more detailed analysis of On-Peak and Off-Peak hours or days of the week would likely highlight the strata, however this

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kind of analysis was not deemed necessary for the purpose of this forecast.

Q48.5 Please show the derivation of the temperature sensitivity factors listed in Table 7.5.2, noting all assumptions.

A48.5 The sensitivity values were calculated as the first derivative of the third degree polynomial function shown in the graph. The sensitivity table was derived using the Excel pivot table feature in conjunction the hourly load and temperature data provided in the spreadsheet BCUC A48.2.xls.

BCUC A48.1

Year	Month	RE (MWh)	CC	UPC	HDD	CDD	HDDBC	CDDBC	
2001	1	118122.549		78077	1.51289815	581	0		
2002	1	113193.946		79049	1.43194659	474	1	492	0.25
2002	2	118385.446		79287	1.49312556	393.5	2	479	1
2002	3	104287.559		79356	1.31417358	365	3	406.5	
2002	4	94401.25		79402	1.18890267	200	4	330.875	
2002	5	87278.869		79365	1.09971485	125	5	222.5	
2002	6	69618.158		79196	0.87906154	14.5	6	116.125	
2002	7	67364.803		79266	0.84985748	10.5	7	41.125	
2002	8	64499.539		79719	0.80908615	5	8	10.125	
2002	9	61993.444		79580	0.77900784	45.5	9	16.5	
2002	10	61159.106		79840	0.76602087	237.5	10	83.375	
2002	11	76387.237		80275	0.95156944	335	11	213.875	
2002	12	89243.153		80254	1.11200878	509	12	354.125	
2003	1	111368.014		80395	1.38526045	583.15	0	484.0375	8.75
2003	2	112402.44		80531	1.3957661	491.05	0	541.5875	3
2003	3	103969.594		80672	1.28879405	393.75	0	489.75	0
2003	4	93042.87		80987	1.14886179	250.1	0	382.1625	0
2003	5	81315.633		81014	1.00372322	167.35	54.5	265.325	13.625
2003	6	69337.295		80816	0.85796495	59.4	89	161.05	49.5
2003	7	62254.181		80909	0.76943456	14.85	186.5	75.25	104.75
2003	8	73703.304		81412	0.90531253	23.65	211	28.1875	168.25
2003	9	67039.577		80939	0.82827286	116	47	44.5375	163.875
2003	10	68017.626		81348	0.83613151	298.1	0	138.4375	76.25
2003	11	77955.231		81237	0.95960253	488.2	0	300.1	11.75
2003	12	93033.337		81920	1.13566085	628.25	0	475.6875	0
2004	1	120864.395		81930	1.47521537	552.25	0	574.2375	0
2004	2	130007.12		82106	1.58340584	513.35	0	561.525	0
2004	3	112764.293		82392	1.36863158	408.6	0	496.8875	0
2004	4	102175.648		82353	1.24070341	289.1	4	404.9125	1
2004	5	83714.237		82250	1.01780227	133.3	71.5	280.025	19.875
2004	6	64464.126		82603	0.78040902	67.05	123	155.6875	67.5
2004	7	0		82279	0	9.5	317	69.225	158.625
2004	8	0	0	0	0	2	287.5		
2004	9	0	0	0	0	63.15	135		
2004	10	0	0	0	0	318.55	2		
2004	11	0	0	0	0	374.3	0		
2004	12	0	0	0	0	520.4	0		

SUMMARY OUTPUT									
Regression Statistics									
Multiple R	0.950900202								
R Square	0.904211193								
Adjusted R Sc	0.897115726								
Standard Erro	0.082295941								
Observations	30								

ANOVA					
	df	SS	MS	F	Significance F
Regression	2	1.726138772	0.863069	127.4350473	1.76909E-14
Residual	27	0.18286079	0.006773		
Total	29	1.908999562			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	Upper 95.0%
Intercept	0.702147876	0.028659139	24.49996	5.61176E-20	0.64334422	0.760951533	0.64334422	0.760951533	0.868522382
HDDBC	0.001266345	8.22273E-05	15.40053	6.78894E-15	0.001097628	0.001435061	0.001097628	0.001435061	0.001119864
CDDBC	0.000242495	0.000116458	2.082244	0.04692517	3.54207E-06	0.000481448	3.54207E-06	0.000481448	0.001026957

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Year	Month	WSE (MWh)	HDD	CDD
2001	1	102930.8	552.25	0
2001	2	79140	513.35	0
2001	3	75613.6	408.6	0
2001	4	61299.2	289.1	0
2001	5	54844.4	133.3	19.25
2001	6	59879.2	67.05	12.15
2001	7	73226.8	9.5	101.9
2001	8	67556.4	2	93.75
2001	9	63040.8	63.15	7.5
2001	10	76740.8	318.55	0
2001	11	78109.2	374.3	0
2001	12	87925.66	520.4	0
2002	1	90699.2	527.8	0
2002	2	79570.4	454.9	0
2002	3	83961.2	501.8	0
2002	4	65757.6	270.8	0
2002	5	62126	165.7	1.95
2002	6	60199.2	32.45	61.2
2002	7	68188	11.85	129
2002	8	68751.6	19.9	81.05
2002	9	61625.6	84.9	5.75
2002	10	71423.6	331.1	0
2002	11	78684.4	399.6	0
2002	12	87024.8	479	0
2003	1	87776.44	486.9	0
2003	2	79342.399	454.75	0
2003	3	79245.2	388.35	0
2003	4	70944	259	0
2003	5	70854	148.95	5.4
2003	6	57440	21.8	53.25
2003	7	75818	1.05	165.75
2003	8	73330	0.8	118.2
2003	9	64203.84	68.1	26.9
2003	10	70921.4	218.85	0
2003	11	87925.66	520.4	0
2003	12	96734.2	553.95	0
2004	1	96734.2	620.9	620.9
2004	2	101674.8	500.85	500.85
2004	3	86482.88	352.3	352.3
2004	4	86324.799	219	219
2004	5	65495.48	129.55	129.55
2004	6	63441.681	31.35	31.35
2004	7		2.25	2.25
2004	8		4.45	4.45
2004	9		0.25	0.25
2004	10		0	0
2004	11		0	0
2004	12		0	0

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.895898926
R Square	0.802634885
Adjusted R Square	0.788015247
Standard Error	5526.704336
Observations	30

ANOVA					
	df	SS	MS	F	Significance F
Regression	2	3353851791	1676925895	54.90115	3.06E-10
Residual	27	824700442.1	30544460.82		
Total	29	4178552233			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	61666.01807	1742.819609	35.38290351	3.69E-24	58090.05	65241.99	58090.05	65241.99
X Variable 1	45.81097519	5.082295764	9.013834952	1.25E-09	35.38297	56.23898	35.38297	56.23898
X Variable 2	25.76520479	6.743988831	3.820469671	0.00071	11.92769	39.60272	11.92769	39.60272

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49.0 Reference: Volume 1, Tab 7.1, Appendix A, pp. 9-10

Q49.1 Please provide an update to Appendix A showing 2004 Actual and Normalized values.

A49.1 Please refer to attachment BCUC A49.1.

Q49.2 Please provide a summary for each customer class (corresponding to Tables 7.6.1 and 7.6.3 in Appendix A) of the applied-for load forecast and the Commission-approved forecast in each year from 2000 to the present.

A49.2 For the years referenced, the load forecasts were recommended by the Load Forecast Review Committee, and accepted as part of the Settlement Package. As such there is no difference between the applied-for and Commission-approved forecast. However, some forecasts were modified from the initial application after review by the Committee or the acquisition of new information. These forecasts are provided below.

Load Forecast History
(GW.h)

Forecast for 2000

Customer Class	Per Initial Filing	As Approved and Recommended by the Committee
Residential	962	967
General Service	485	485
Industrial	279	279
Wholesale	835	835
Lighting	12	12
Irrigation	42	42
Total	2,615	2,620

Forecast for 2001

Customer Class	Per Initial Filing	As Approved and Recommended by the Committee
Residential	990	990
General Service	503	503
Industrial	279	298
Wholesale	862	862
Lighting	12	12
Irrigation	45	45
Total	2,691	2,710

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Forecast for 2002

Customer Class	Per Initial Filing	As Approved and Recommended by the Committee
Residential	1,016	1,016
General Service	527	527
Industrial	351	351
Wholesale	884	884
Lighting+Irrigation	57	57
Total	2,835	2,835

Forecast for 2003

Customer Class	Per Initial Filing	As Approved and Recommended by the Committee
Residential	1,029	1,029
General Service	539	539
Industrial	297	315
Wholesale	894	894
Lighting+Irrigation	55	55
Total	2,814	2,832

Forecast for 2004

Customer Class	Per Initial Filing	As Approved and Recommended by the Committee
Residential	1,042	1,042
General Service	549	549
Industrial	338	338
Wholesale	906	906
Lighting	10	10
Irrigation	45	45
Total	2,890	2,890

Q49.3 Please explain the reasons for the differences between the load forecasts for individual wholesale customers. What does imply about how FortisBC's load forecast may differ by region?

A49.3 The 2005 Load and Customer Forecast considered the Wholesale class as a single composite class. Analysis by customer within this class was not done as a part of this forecast.

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Q49.4 For the Wholesale class please provide a breakdown by wholesale customer of the actual and forecast energy sales as reported in Table 7.6.1. Please also provide for each wholesale customer, if available, a breakdown of the forecast by customer class within each wholesale customer.

A49.4 The breakdown of the Wholesale class by individual customers and further breakdown of the individual wholesale customers by customer class was not done as a part of the 2005 Load and Customer Forecast.

Q49.5 Please comment on how the overall Wholesale customer forecast compares to the overall FortisBC load forecast. Does this comparison offer a useful check of the FortisBC load forecast? Why or why not?

A49.5 Please refer to attachment BCUC A175.1 REF7.

The average annual wholesale growth rate during the forecast period amounts to about 1% and is about the same as that for the net or the gross system energy. Since wholesale, general service and residential loads all are driven in part by population growth, this result is expected.

BCUC A49.1

Actual and Forecast Energy Sales by Customer Class Including DSM

Sales (GWh)	Actual				Updated Feb2005	Normalized				Updated Feb2005	Forecast			
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004	2005	2006	2007	
Residential	978	986	997	1013	1020.2	968	1,000	1,010	1,030	1,038	1,049	1,064	1,077	1,087
General Service	498	514	517	520	528	498	514	517	520	528	551	570	580	585
Wholesale	873	881	878	907	931	863	883	877	911	937	943	964	976	986
Industrial	279	323	347	337	344.5	290	335	363	337	345	339	343	348	352
Lighting	12	10	10	10	9.7	12	10	10	10	10	10	10	10	10
Irrigation	43	43	47	52	40.2	43	43	54	52	40	47	47	47	47
Net Load	2682	2733	2791	2839	2873	2675	2785	2832	2859	2898	2939	2999	3038	3069
Losses	310	293	330	343		309	301	342	349		361	369	337	340
Losses %	11.6%	10.7%	11.8%	12.1%		11.6%	10.8%	12.1%	12.2%		12.3%	12.3%	11.1%	11.1%
Gross Load	2992	3026	3121	3,182		2984	3086	3174	3209		3300	3368	3375	3409
System Peak														
Expected Annual Winter Peak (MW)	614	570	577	610		650	698	647	680		700	712	715	722

Perent Annual Change by Customer Class

Customer Class	Actual				Updated Feb2005	Normalized				Updated Feb2005	Forecast			
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004	2005	2006	2007	
Residential	0.8%	1.1%	1.6%	1.6%	0.7%	3.2%	1.1%	2.0%	2.0%	0.8%	1.8%	1.5%	1.2%	1.0%
General Service	3.2%	0.6%	0.6%	0.6%	1.5%	3.2%	0.6%	0.6%	0.6%	1.5%	6.0%	3.4%	1.7%	1.0%
Wholesale	0.9%	-0.4%	3.3%	3.3%	2.6%	2.2%	-0.6%	3.8%	3.8%	2.9%	3.5%	2.2%	1.3%	1.0%
Industrial	15.8%	7.4%	-2.9%	-2.9%	2.2%	15.7%	8.2%	-7.3%	-7.3%	2.3%	0.6%	1.4%	1.3%	1.3%
Lighting	-16.7%	0.0%	0.0%	0.0%	-3.0%	-16.7%	1.1%	-1.6%	-1.6%	-2.5%	3.0%	0.0%	0.0%	0.0%
Irrigation	0.0%	9.3%	10.6%	10.6%	-22.7%	0.0%	26.1%	-4.5%	-4.5%	-22.3%	-8.4%	0.0%	0.0%	0.0%
Net Load	1.9%	2.1%	1.7%	1.7%		4.1%	1.7%	1.0%	1.0%		2.8%	2.0%	1.3%	1.0%
Losses	-5.5%	12.6%	3.9%	3.9%		-2.6%	13.6%	2.1%	2.1%		3.5%	2.0%	-8.6%	1.0%
Gross Load	1.1%	3.1%	2.0%	2.0%		3.4%	2.8%	1.1%	1.1%		2.9%	2.0%	0.2%	1.0%
Expected Annual Winter Peak						7.3%	-7.3%	5.1%	5.1%		2.9%	1.9%	0.3%	1.1%

Actual and Forecast Year End Customer Count

Customer Class	Actual				Updated Feb2005	Forecast			
	2000	2001	2002	2003	2004	2004	2005	2006	2007
Residential	78008	79121	80421	82174	84008	84076	85926	87645	89223
General Service	8700	8974	9153	9433	9901	9929	10306	10564	10754
Wholesale	8	8	8	8	9	8	8	8	8
Industrial	34	37	37	38	40	40	40	40	40
Other	933	932	1099	1100	1100	1100	1100	1100	1100
Total	87683	89072	90718	92753	95058	95153	97380	99357	101125
Customer Account Growth		1389	1646	2035	2305	2400	2227	1977	1768

Percent Annual Change by Customer Class

Customer Class	Actual				2004	Forecast			
	2000	2001	2002	2003	2004	2004	2005	2006	2007
Residential	1.4%	1.6%	2.2%	2.2%	2.2%	2.3%	2.2%	2.0%	1.8%
General Service	3.1%	2.0%	3.1%	3.1%	5.0%	5.3%	3.8%	2.5%	1.8%
Wholesale	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%
Industrial	8.8%	0.0%	2.7%	2.7%	5.3%	5.3%	0.0%	0.0%	0.0%
Other	-0.1%	17.9%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	1.6%	1.8%	2.2%	2.2%	2.5%	2.6%	2.3%	2.0%	1.8%