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2 **MANITOBA HYDRO**
3 **2010/11 & 2011/12 GENERAL RATE APPLICATION**
4
5 **ELECTRIC LOAD FORECAST AND LOAD RESEARCH**
6

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MANITOBA HYDRO
2010/11 & 2011/12 GENERAL RATE APPLICATION

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LOAD FORECAST AND LOAD RESEARCH

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7.0 OVERVIEW

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Tab 7 discusses the Electric Load Forecast and Load Research results.

Section 7.1 provides a summary of Electric Load Forecast results.

Section 7.2 provides a summary of the Electric Load Research results.

Appendix 7.1 is the 2009/10 Electric Load Forecast Report.

7.1 ELECTRIC LOAD FORECAST SUMMARY

The Electric Load Forecast provides a projection of future electricity demand in Manitoba with a forecast provided for both energy and capacity requirements. A copy of the 2009 Electric Load Forecast is provided in Appendix 7.1.

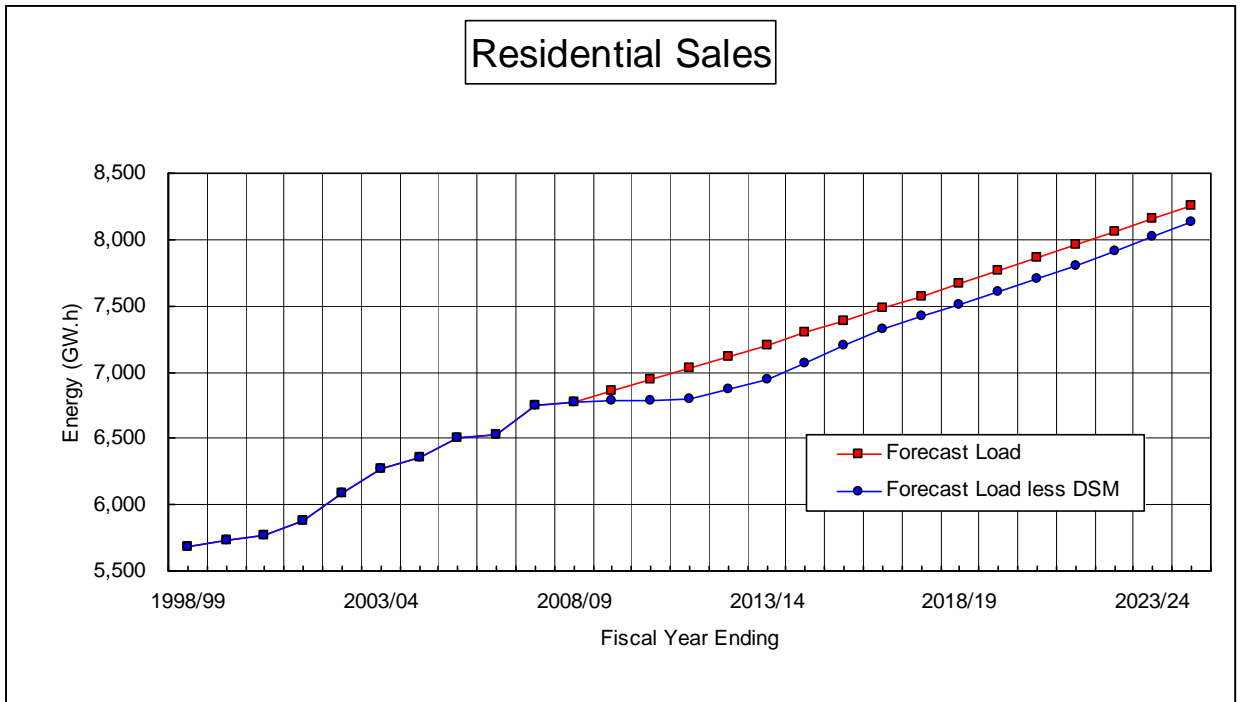
1 **Residential Sector**

2
3 Historical Period (1998/99 - 2008/09):

4
5 Over the past ten years, the electricity demand in the residential sector has grown by an
6 average of 109 GW.h per year on a weather-adjusted basis. The Residential sector has
7 grown due to a number of factors including the addition of more buildings, increased use
8 of electricity for water heating purposes, more computers, and larger televisions being
9 used per dwelling.

10
11 Forecast Period (2009/10 - 2024/25):

12
13 Over the forecast period, the Residential sector is expected to grow by 92 GW.h per year.
14 The lower forecast growth rate is primarily due to anticipated replacement of inefficient
15 appliances. The forecast also anticipates a slight growth in the electric space heating
16 market as well as growth in the electric water heating market. With the inclusion of
17 energy savings achieved through Power Smart programs, the overall net Residential
18 growth is expected to be 85 GW.h per year.



20 **Note:** Sales forecast at meter.

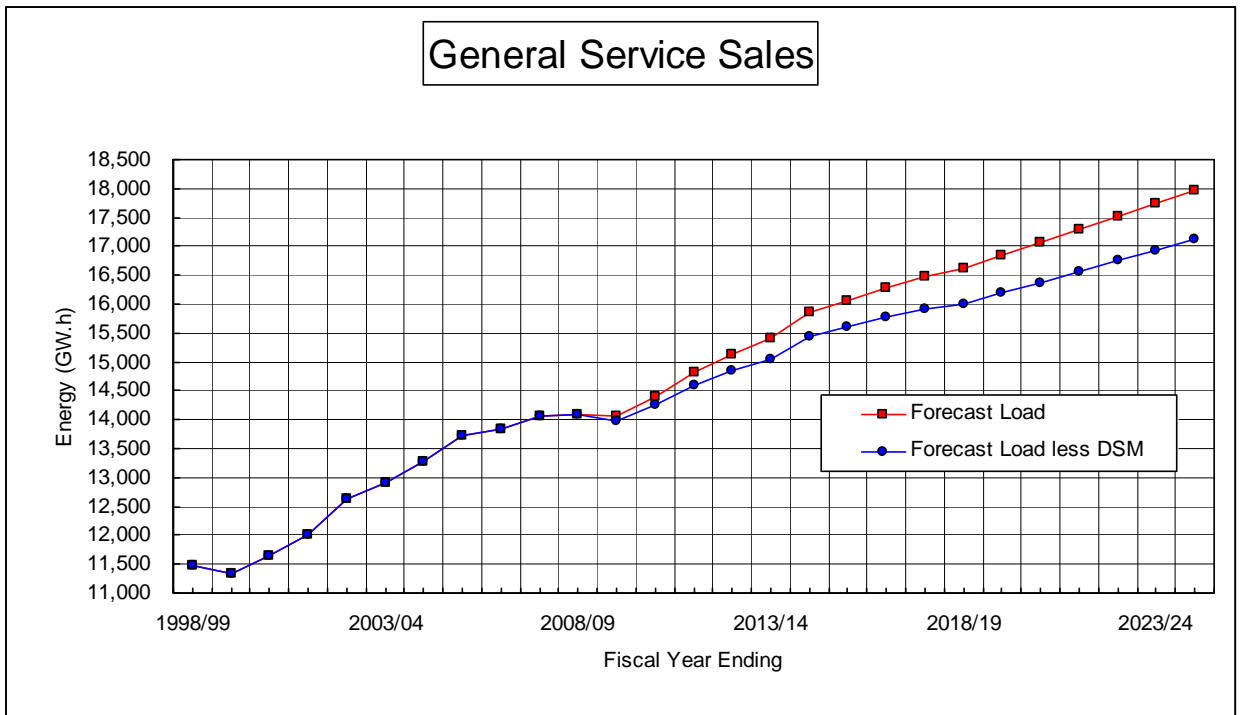
1 **General Service Sector**

2
3 Historical Period (1998/99 - 2008/09):

4
5 During the past ten years, the General Service sector has grown 261 GW.h per year, on a
6 weather-adjusted basis. The growth has been evenly split between Mass Market and Top
7 Consumer categories. Economic performance across the Mass Market has been relatively
8 steady during this period, while most of the growth in the Top Consumer group is due to
9 expansion in the Chemical sector.

10
11 Forecast Period (2009/10 - 2024/25):

12
13 During the forecast period, the General Service sector is expected to grow 242 GW.h per
14 year. This sector is projected to decline in 2009, primarily due to the effects of the
15 economic downturn, then return to normal growth for the remainder of the period. The
16 inclusion of DSM programs will further lower General Service growth to 190 GW.h per
17 year.



19
20 **Note:** Sales forecast at meter.

1 **Net Firm Energy**

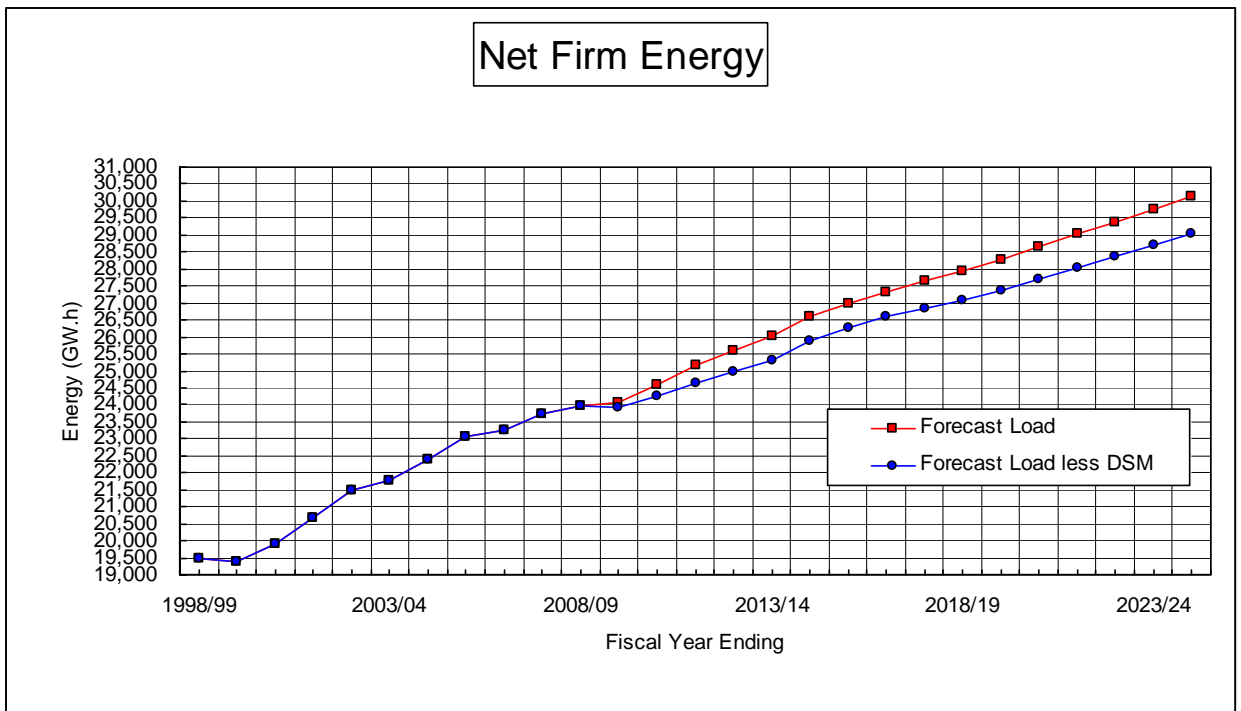
2
3 Net Firm Energy includes all electricity that is generated to meet firm energy
4 requirements for all customers within Manitoba and excludes non-firm (interruptible
5 load) and station service loads.
6

7 Historical Period (1998/88 - 2008/09):

8
9 During the past ten years, Net Firm Energy has grown 451 GW.h per year on a weather-
10 adjusted basis. The trend in Net Firm Energy growth has been relatively consistent over
11 the period. The recession had a significant impact on some General Service Top
12 Consumers in 2008/09 and was the main reason for the lower growth rate in that year.
13

14 Forecast Period (2009/10 - 2024/25):

15
16 During the forecast period, net Firm Energy is expected to grow 384 GW.h per year.
17 Lower load growth is projected, primarily due to the impact of the recession on General
18 Service Top Consumers during 2009/10. The inclusion of DSM programs will further
19 lower Net Firm Energy growth to 317 GW.h per year.
20



21 **Note:** Energy forecast at generation.
22

1 **Net Total Peak**

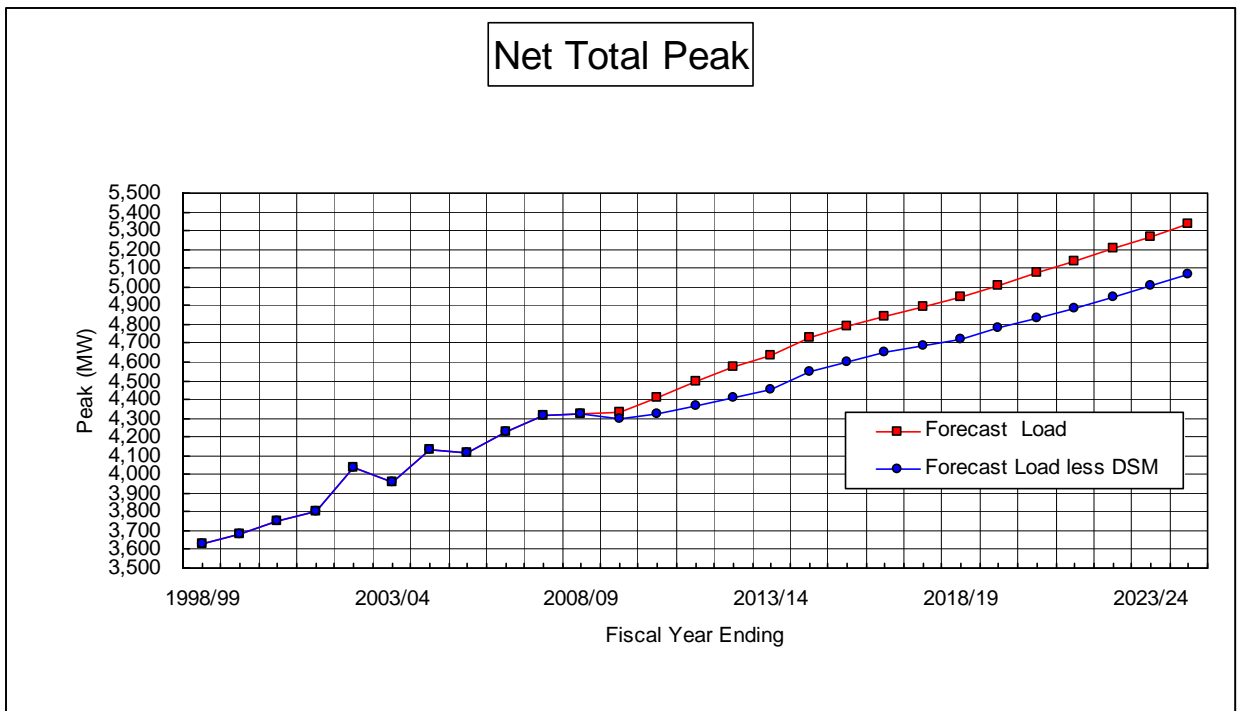
2
3 The Net Total Peak is the maximum integrated hourly load at generation adjusted for
4 losses associated with exports or imports, less station service, but with curtailed loads
5 added back in. The term “integrated” indicates that the average load within the peak hour
6 is used.

7
8 Historical Period (1998/99 - 2008/09):

9
10 During the past ten years, Net Total Peak has grown 69 MW per year, on a weather-
11 adjusted basis. Net Total Peak has grown significantly since 1998/99, reflecting the
12 general growth in energy load over that period.

13
14 Forecast Period (2009/10 - 2024/25):

15
16 During the forecast period, Net Total Peak is projected to grow 63 MW per year. The
17 lower forecasted peak growth is due to slow growth in 2009/10. Growth is expected to
18 return to historical growth rates over the remainder of the period. The inclusion of DSM
19 programs will lower the demand growth to 46 MW per year.
20



21 Note: Peak forecast at generation.
22

1 **7.2 ELECTRIC LOAD RESEARCH RESULTS**

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This Section presents a summary of results by customer class from the Corporation’s load research program. These results are used to develop the customer class energy and peak responsibility tables in the Corporation’s Cost of Service Study. The load research results pertain to the fiscal year ending March 31, 2009. The load research results are an integral part of the Cost of Service Study which applies forecast energies to the results to develop energy and demand allocators.

The Load Research tables provided in this section are as follows:

- 7.2.1 2008/09 load research summary which shows: number of customers, billed energy, average energy, estimated coincident and non-coincident peaks by class and relative accuracy of peak load estimates.
- 7.2.2 Highest 50 total peak hours – Winter 2008/09
- 7.2.3 Highest 50 total peak hours – Summer 2008/09

1 Schedule 7.2.1 (1) – Load Research Summary by Customer Class

Load Research Results Average 2008/2009
Corresponding to Highest 50 Winter Generation Peaks

	Year End Metered Customer Count	Average Metered Customer Years	Total Energy	Average Energy	CP Load kW		Avg CP Load Factor	Relative Accuracy %	NCP Load Nov-Apr 00:00 to 24:00	NCP time	NCP LF	Variance
					Dec-Feb 06:00 to 22:00	CP Load Factor						
Residential	442,569	440,635	6,894,690,072	15,647	1,175,389	2.67	67.0%	4.48	1,703,125	12/14/2008 19:00	46.2%	2,772,806,338
GS Small Non Demand	51,990	51,936	1,571,741,845	30,263	249,915	4.81	71.8%	11.12	342,999	1/14/2009 14:00	52.3%	772,311,468
GS Small Demand	6,836	6,773	1,903,094,633	280,983	288,522	42.60	75.3%	4.74	365,111	1/15/2009 10:00	59.5%	187,031,334
GS Medium	1,857	1,824	3,027,924,298	1,660,046	434,510	238.22	79.6%	3.68	531,151	1/14/2009 10:00	65.1%	255,678,512
GS Medium SEP	19	19	19,765,261	1,040,277	3,336	175.59	67.6%	0.00	5,945	1/15/2009 7:00	38.0%	0
GS Medium Total	1,876	1,843	3,047,689,559	1,653,657	437,846	237.57	79.5%					
GS Large 750-30 kV	260	254	1,551,755,741	6,109,275	215,349	847.83	82.3%	1.58	243,843	12/15/2008 11:00	72.6%	11,577,135
GS Large Sep	5	5	2,579,646	515,929	528	105.64	55.8%	0.00	1,341	11/3/2008 12:00	22.0%	0
GS Large 750-30kV Total	265	259	1,554,335,387	6,001,295	215,877	833.50	82.2%					
GS Large 30-100 kV	29	27	730,061,703	27,039,322	91,556	3,390.96	91.0%	0.00	116,623	12/5/2008 10:00	71.5%	0
GS Large 30-100 kV Curtailable	1	1	205,929,389	205,929,389	25,368	25,367.66	92.7%	0.00	26,458	4/2/2008 20:00	88.8%	0
GS Large 30-100 Total	30	28	935,991,102	33,428,254	116,924	4,175.85	91.4%					
GS Large > 100 kV	12	12	2,671,365,410	222,613,784	329,415	27,451.23	92.6%	0.00	383,827	4/4/2008 22:00	79.4%	0
GS Large > 100 kV Curtailable	3	3	2,477,205,649	825,735,216	270,078	90,026.11	104.7%	0.00	326,880	1/23/2009 17:00	86.5%	0
GS Large > 100kV Total	15	15	5,148,571,059	343,238,071	599,493	39,966.21	98.0%					
COMMONBUS EXPORTS			22,305,386,959		3,609,218		70.5%		4,094,590	1/15/2009 9:00	62.2%	
GENERATION			10,828,038,000		975,820		126.7%		1,950,000	11/2/2008 9:00	63.4%	
IMPORTS			34,738,510,000		4,771,720		83.1%		4,953,000	12/16/2008 16:00	80.1%	
WINDGENERATION			1,239,868,000		202,500		69.9%		1,069,000	12/26/2008 2:00	13.2%	
			382,942,577		22,283		196.2%		102,901	1/17/2009 21:00	42.5%	

1 Schedule 7.2.1 (2)- Load Research Summary by Customer Class

Load Research Results Average 2008/2009
Corresponding to Highest 50 Summer Generation Peaks

	Year End Metered Customer Count	Average Metered Customer Years	Total Energy	Average Energy	CP Load KW Jun-Aug 06:00 to 22:00	Avg CP Load Factor	Relative Accuracy %	NCP Load May-Oct 00:00 to 24:00	NCP time	NCP LF	Variance
Residential	442,569	440,635	6,894,690,072	15,647	665,417	1.51 118.3%	6.30	1,050,995	10/26/2008 19:00	74.9%	1,757,390,744
GS Small Non Demand	51,990	51,936	1,571,741,845	30,263	197,740	3.81 90.7%	10.52	245,956	8/21/2008 15:00	72.9%	432,735,360
GS Small Demand	6,836	6,773	1,903,094,633	280,983	226,480	33.44 95.9%	5.24	281,813	10/27/2008 10:00	77.1%	140,839,387
GS Medium	1,857	1,824	3,027,924,298	1,660,046	397,387	217.87 87.0%	4.84	451,123	8/20/2008 14:00	76.6%	369,929,452
GS Medium SEP	19	19	19,765,261	1,040,277	256	13.49 880.0%	0.00	3,766	10/28/2008 8:00	59.9%	0
GS Medium Total	1,876	1,843	3,047,689,559	1,653,657	397,644	215.76 87.5%					
GS Large 750-30 kV	260	254	1,551,755,741	6,109,275	217,666	866.95 81.4%	2.02	243,085	8/20/2008 15:00	72.9%	19,332,368
GS Large Sep	5	5	2,579,646	515,929	736	147.29 40.0%	0.00	2,197	6/4/2008 12:00	13.4%	0
GS Large Total	265	259	1,554,335,387	6,001,295	218,403	843.25 81.2%					
GS Large 30-100 kV	29	27	730,061,703	27,039,322	82,475	3,064.62 101.0%	0.00	106,069	10/20/2008 20:00	78.6%	0
GS Large 30-100 kV Curtailable	1	1	205,929,399	205,929,399	26,217	26,216.54 89.7%	0.00	26,873	9/22/2008 1:00	87.5%	0
GS Large 30-100 kV Total	30	28	935,991,102	33,428,254	108,691	3,881.83 98.3%					
GS Large > 100 kV	12	12	2,671,365,410	222,613,784	281,903	23,491.93 108.2%	0.00	360,249	10/29/2008 0:00	84.6%	0
GS Large > 100 kV Curtailable	3	3	2,477,205,649	825,735,216	287,435	95,811.63 98.4%	0.00	324,321	10/24/2008 3:00	87.2%	0
GS Large > 100 kV Total	15	15	5,148,571,059	343,238,071	569,338	37,955.87 103.2%					
COMMONBUS EXPORTS GENERATION IMPORTS WINDGENERATION			22,305,386,959		2,504,043	101.7%		2,909,238	10/27/2008 9:00	87.5%	
			10,828,038,000		1,913,160	64.6%		2,348,000	8/6/2008 5:00	52.6%	
			34,738,510,000		4,736,620	83.7%		4,800,000	8/18/2008 12:00	82.6%	
			1,239,868,000		121,000	117.0%		454,000	6/2/2008 19:00	31.2%	
			382,942,577		15,129	289.0%		102,815	5/2/2008 0:00	42.5%	

2

1 Schedule 7.2.2 - Highest 50 Generation Peak Hours – Winter 2008/09

Top 50 Winter Hours (December, January and February; 06:00 to 22:00)

Total Generation

Sum of Sum of kWh		RevenueClass						
DTE		GENERATION	COMMONBUS	EXPORTS	IMPORTS	STATIONSERVICE	CURTOVER100	CURTUNDER100
12/1/2008 9:00		4,743,000	3,320,749	1,106,000	123,000	37,250	0	0
12/1/2008 17:00		4,798,000	3,296,992	1,266,000	118,000	28,630	0	0
12/2/2008 18:00		4,761,000	3,453,048	1,112,000	115,000	38,770	0	0
12/2/2008 19:00		4,750,000	3,410,475	1,116,000	99,000	39,120	0	0
12/3/2008 18:00		4,746,000	3,456,583	943,000	66,000	39,690	0	0
12/6/2008 17:00		4,767,000	3,350,632	1,105,000	108,000	43,960	0	0
12/6/2008 18:00		4,770,000	3,509,880	945,000	109,000	44,490	0	0
12/6/2008 19:00		4,752,000	3,474,224	980,000	116,000	30,220	0	0
12/6/2008 20:00		4,767,000	3,438,248	1,035,000	114,000	30,330	0	0
12/6/2008 21:00		4,734,000	3,402,152	1,047,000	128,000	32,010	0	0
12/7/2008 20:00		4,764,000	3,316,094	1,119,000	80,000	41,750	0	0
12/8/2008 8:00		4,726,000	3,436,282	1,018,000	136,000	39,540	0	0
12/10/2008 12:00		4,747,000	3,492,964	1,069,000	172,000	54,300	0	0
12/11/2008 18:00		4,772,000	3,789,251	807,000	227,000	45,310	0	0
12/11/2008 19:00		4,729,000	3,769,272	789,000	228,000	46,780	0	0
12/15/2008 20:00		4,880,000	3,985,304	781,000	300,000	55,660	0	0
12/15/2008 21:00		4,836,000	3,962,459	707,000	226,000	40,130	0	0
12/16/2008 10:00		4,770,000	3,880,425	793,000	257,000	47,140	0	0
12/16/2008 11:00		4,741,000	3,728,749	956,000	291,000	48,810	0	0
12/16/2008 12:00		4,829,000	3,669,172	1,090,000	277,000	49,480	0	0
12/16/2008 13:00		4,930,000	3,648,274	1,226,000	321,000	50,750	0	0
12/16/2008 14:00		4,860,000	3,631,445	1,206,000	359,000	51,920	0	0
12/16/2008 15:00		4,831,000	3,638,116	1,207,000	367,000	44,320	0	0
12/16/2008 16:00		4,953,000	3,713,835	1,194,000	336,000	32,490	0	0
12/16/2008 17:00		4,782,000	3,878,011	838,000	274,000	32,370	0	0
12/16/2008 20:00		4,756,000	3,936,196	798,000	260,000	36,380	0	0
12/16/2008 21:00		4,791,000	3,882,878	826,000	241,000	37,410	0	0
12/17/2008 10:00		4,743,000	3,829,527	835,000	254,000	52,550	0	0
12/17/2008 11:00		4,747,000	3,705,236	898,000	219,000	45,800	0	0
12/17/2008 14:00		4,783,000	3,469,365	1,181,000	286,000	40,060	0	0
12/17/2008 17:00		4,773,000	3,703,724	921,000	250,000	43,900	0	0
12/18/2008 21:00		4,765,000	3,900,150	763,000	285,000	51,860	0	0
12/23/2008 11:00		4,731,000	3,501,890	931,000	122,000	40,220	0	0
1/6/2009 21:00		4,725,000	3,636,335	894,000	188,000	37,020	0	0
1/7/2009 18:00		4,750,000	3,759,940	810,000	223,000	28,600	0	0
1/8/2009 17:00		4,738,000	3,646,111	911,000	239,000	39,920	0	0
1/8/2009 18:00		4,737,000	3,832,389	742,000	267,000	40,270	0	0
1/8/2009 21:00		4,736,000	3,772,123	885,000	348,000	44,730	0	0
1/12/2009 18:00		4,801,000	3,935,748	634,000	183,000	33,230	0	0
1/12/2009 20:00		4,770,000	3,917,168	666,000	202,000	35,670	0	0
1/12/2009 21:00		4,746,000	3,898,770	587,000	133,000	37,460	0	0
1/13/2009 11:00		4,762,000	3,885,090	802,000	293,000	34,360	0	0
1/13/2009 12:00		4,727,000	3,844,183	748,000	240,000	36,930	0	0
1/13/2009 15:00		4,740,000	3,697,577	853,000	218,000	39,910	0	0
1/21/2009 8:00		4,731,000	3,146,384	1,386,000	135,000	29,840	0	0
1/22/2009 8:00		4,754,000	3,197,016	1,239,000	125,000	35,820	0	0
1/22/2009 11:00		4,771,000	3,195,809	1,226,000	99,000	38,630	0	0
1/22/2009 12:00		4,775,000	3,198,314	1,229,000	104,000	39,750	0	0
1/22/2009 13:00		4,727,000	3,147,076	1,239,000	99,000	40,650	0	0
1/22/2009 16:00		4,769,000	3,169,240	1,332,000	165,000	44,310	0	0

2

1 **Schedule 7.2.3 - Highest 50 Generation Peak Hours – Summer 2008/09**

Top 50 Summer Hours (June, July and August; 06:00 to 22:00)

Total Generation

Sum of Sum of kWh	RevenueClass						
DTE	GENERATION	COMMONBUS	EXPORTS	IMPORTS	STATIONSERVICE	CURTOVER100	CURTUNDER100
6/19/2008 14:00	4,720,000	2,478,642	1,909,000	103,000	18,930	0	0
6/19/2008 15:00	4,714,000	2,473,753	1,908,000	112,000	19,600	0	0
6/19/2008 16:00	4,722,000	2,479,248	1,890,000	103,000	20,690	0	0
6/24/2008 17:00	4,730,000	2,532,568	1,892,000	150,000	23,980	0	0
6/26/2008 16:00	4,715,000	2,589,867	1,799,000	135,000	23,850	0	0
7/10/2008 12:00	4,712,000	2,288,893	2,120,000	120,000	29,150	0	0
7/10/2008 13:00	4,713,000	2,306,300	2,106,000	113,000	20,690	0	0
7/10/2008 14:00	4,711,000	2,345,512	2,072,000	115,000	21,700	0	0
7/10/2008 17:00	4,712,000	2,368,597	2,067,000	111,000	23,140	0	0
7/10/2008 19:00	4,753,000	2,347,003	2,144,000	145,000	24,470	0	0
7/10/2008 20:00	4,753,000	2,334,129	2,142,000	146,000	25,310	0	0
7/10/2008 21:00	4,717,000	2,297,257	2,161,000	152,000	25,710	0	0
7/15/2008 11:00	4,712,000	2,261,724	2,116,000	108,000	26,830	0	0
7/17/2008 12:00	4,722,000	2,321,868	2,035,000	98,000	22,950	0	0
7/18/2008 20:00	4,715,000	2,346,395	2,028,000	109,000	25,670	0	0
7/21/2008 10:00	4,711,000	2,327,312	2,042,000	108,000	30,700	0	0
7/21/2008 20:00	4,735,000	2,482,035	1,900,000	97,000	28,680	0	0
7/22/2008 10:00	4,720,000	2,379,580	1,998,000	108,000	28,970	0	0
7/30/2008 18:00	4,711,000	2,548,124	1,827,000	120,000	23,140	0	0
7/30/2008 22:00	4,735,000	2,397,248	2,028,000	122,000	25,660	0	0
8/6/2008 10:00	4,711,000	2,254,435	2,115,000	115,000	33,530	0	0
8/6/2008 15:00	4,790,000	2,472,028	1,953,000	82,000	29,280	0	0
8/6/2008 17:00	4,743,000	2,528,413	1,828,000	68,000	27,950	0	0
8/6/2008 22:00	4,755,000	2,371,119	2,030,000	92,000	31,030	0	0
8/8/2008 13:00	4,748,000	2,525,301	1,877,000	109,000	38,710	0	0
8/8/2008 14:00	4,719,000	2,571,012	1,804,000	106,000	39,760	0	0
8/8/2008 15:00	4,730,000	2,597,412	1,789,000	109,000	32,070	0	0
8/8/2008 17:00	4,721,000	2,627,998	1,737,000	97,000	24,840	0	0
8/13/2008 14:00	4,734,000	2,480,012	1,967,000	166,000	22,520	0	0
8/14/2008 10:00	4,724,000	2,376,751	2,069,000	179,000	19,900	0	0
8/14/2008 12:00	4,717,000	2,542,085	1,898,000	178,000	21,340	0	0
8/17/2008 17:00	4,723,000	2,609,536	1,807,000	146,000	20,430	0	0
8/18/2008 12:00	4,800,000	2,531,976	1,990,000	169,000	29,210	0	0
8/18/2008 13:00	4,763,000	2,571,358	1,887,000	142,000	31,010	0	0
8/18/2008 14:00	4,792,000	2,610,085	1,872,000	139,000	30,980	0	0
8/18/2008 15:00	4,799,000	2,642,994	1,854,000	147,000	31,790	0	0
8/18/2008 16:00	4,727,000	2,642,053	1,772,000	132,000	32,050	0	0
8/18/2008 17:00	4,757,000	2,684,156	1,740,000	117,000	24,430	0	0
8/18/2008 18:00	4,755,000	2,688,145	1,747,000	124,000	25,380	0	0
8/18/2008 19:00	4,747,000	2,630,850	1,778,000	106,000	25,570	0	0
8/18/2008 20:00	4,768,000	2,564,977	1,880,000	118,000	26,050	0	0
8/18/2008 21:00	4,728,000	2,488,037	1,932,000	126,000	26,180	0	0
8/19/2008 16:00	4,777,000	2,674,148	1,756,000	107,000	30,540	0	0
8/19/2008 17:00	4,758,000	2,736,169	1,687,000	115,000	31,510	0	0
8/19/2008 18:00	4,753,000	2,798,048	1,610,000	100,000	32,580	0	0
8/19/2008 19:00	4,745,000	2,778,214	1,617,000	97,000	25,200	0	0
8/19/2008 21:00	4,728,000	2,672,879	1,742,000	124,000	26,530	0	0
8/21/2008 14:00	4,741,000	2,759,086	1,684,000	93,000	37,450	0	0
8/26/2008 15:00	4,713,000	2,488,558	1,948,000	116,000	23,700	0	0
8/28/2008 14:00	4,732,000	2,378,268	2,104,000	156,000	22,560	0	0

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