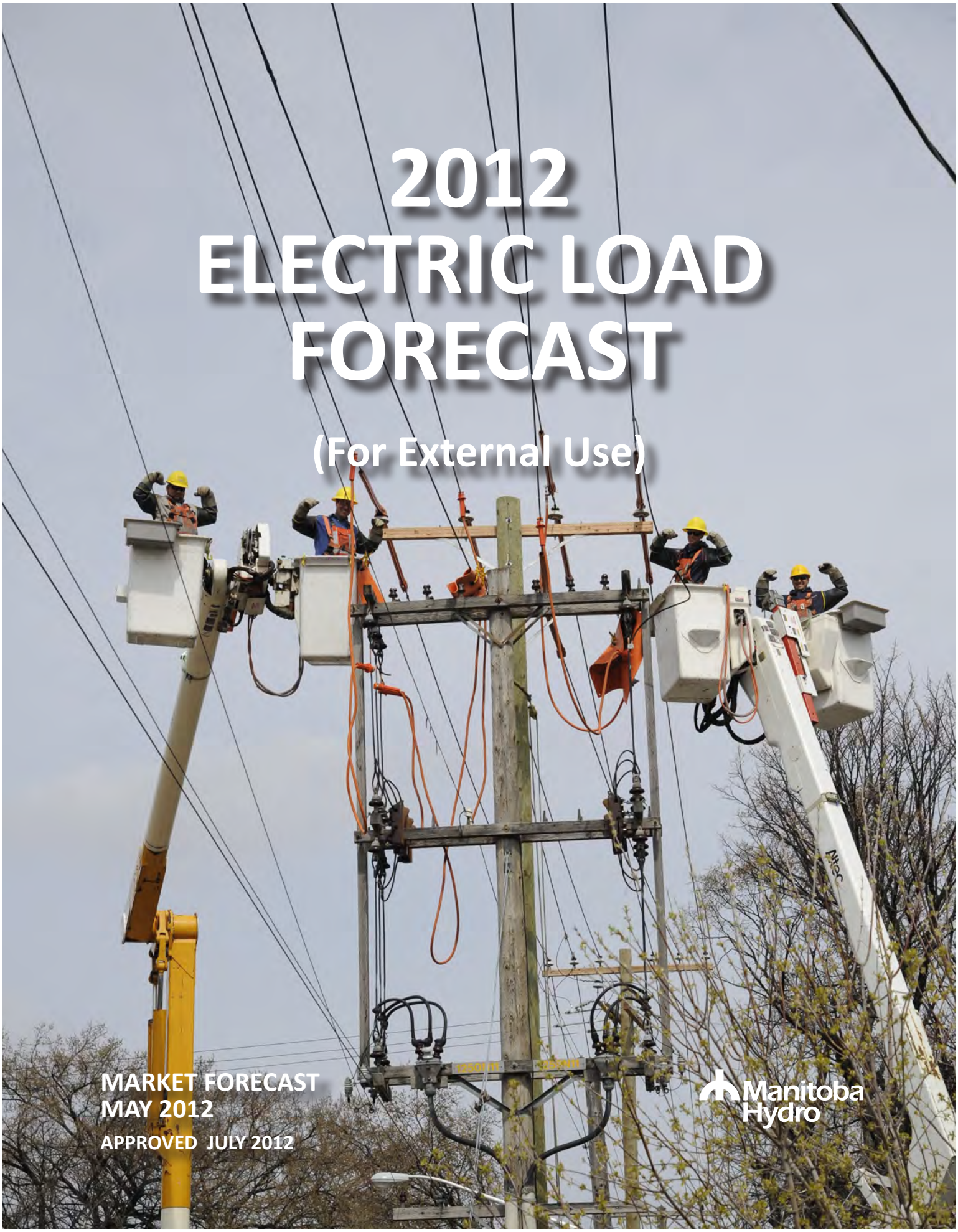

2012 ELECTRIC LOAD FORECAST

(For External Use)

MARKET FORECAST
MAY 2012
APPROVED JULY 2012

Manitoba Hydro

EXECUTIVE SUMMARY

Overview

The actual Gross Firm Energy was 23,605 GW.h in 2011/12. Gross Firm Energy has grown 371 GW.h (1.7%) per year for the past 10 years. It is forecast to grow to 33,425 GW.h by 2031/32 at an average growth of 453 GW.h or 1.6% per year.

Most of the forecast growth is expected to occur in General Service Mass Market, growing 172 GW.h (1.9%) per year over the next ten years, followed by Residential Basic at 118 GW.h (1.5%) and Top Consumers at 116 (1.9%) per year.

During the last 10 years, Residential Basic customers have grown at an average of 3909 (0.9%) per year. Manitoba Hydro's 2012 Economic Outlook provides the forecast of Residential Basic customers, and this document uses that forecast. It calls for a growth of 6,301 (1.3%) per year over the next ten years and 6,290 (1.2%) per year over the next 20 years. The primary reason for the increase is an expectation of increased population growth in Manitoba due to government immigration initiatives which will impact both the Residential and Commercial Sectors.

Gross Total Peak is forecast to grow from a weather adjusted peak of 4,380 MW in 2011/12 to 6,032 MW at 83 MW (1.6%) per year by 2031/32.

Comparison with the 2011 Forecast

The Gross Firm Energy forecast is down 212 GW.h in 2012/13 due to initial-year decreases to the GS Mass Market and GS Top Consumers forecasts. This difference narrows due to the increased forecast of customers and by 2020/21 the forecast is down only 61 GW.h. By 2030/31, the Gross Firm Energy forecast is up 359 GW.h (1.1%) which is equivalent to 3/4 of a year of load growth (1 year = approximately 450 GW.h).

Changes made (and the 2030/31 effect):

1. Residential Basic forecast (+222 GW.h), primarily due to the increase in the forecast of customers (+283 GW.h).

2. General Service Mass Market forecast (+39 GW.h), affected by the increase in the forecast of customers (+340 GW.h) but largely offset by decreases due to GDP, modeling, Codes and Standards and Electric Vehicles.
3. General Service Top Consumers forecast (+48 GW.h). This is the net change of the 17 consumers individually forecast.
4. Other Sales and Losses (+50 GW.h)

The Gross Total Peak forecast is down 158 MW in 2012/13 which is a significant drop of 2 years of peak growth (1 year = approximately 80 MW). The reason for the large drop was a correction to the Distribution Losses calculation for the peak. This resulted in a decrease to the peak forecast of 135 MW in 2012/13, 151 MW in 2020/21 and 171 MW in 2030/31. After modifying the peak to reflect changes in the energy forecast, final changes to the peak forecast were down 158 MW in 2012/13, down 184 MW by 2020/21 and down 134 MW by 2030/31.

Load Variability and Possible Events

The forecast presented in this document is Manitoba Hydro's best estimate of Manitoba's future electricity requirements. Recognizing the potential for variation, load variability is analyzed using a probabilistic-based approach to determine how future actual loads may vary from the forecast. Using the 10% and 90% confidence bands as a proxy for the Low and High scenarios, by 2031/32 the Load Forecast could vary by ±2,555 GW.h or ±7.6%.

In addition, Manitoba Hydro examines possible events of interest for their potential impact on system load requirements. These events are deemed to be captured within the overall load variability analysis of the forecast. Although not specifically identified within the analysis, they are presented so their individual effects may be considered from a sensitivity perspective if the need arises. These events are summarized in the following table.

	Energy Effect (GW.h)	Peak Effect (MW)
Climate Change per Degree Celsius Warmer	+100	-40
One New Very Large Industrial Customer	+1,500	+180
One Less Very Large Industrial Customer	-1,500	-180
Additional Load if Electric Vehicles Grow to 70%	+1,666	+208
10% of all Res Customers switch to Electric Heat	+746	+243
10% of all Res Customers switch to Electric Water Heaters	+202	+23

Table 1 - Gross Energy and Peak

GROSS FIRM ENERGY AND GROSS TOTAL PEAK
History and Forecast
2001/02 - 2031/32

	Gross Firm Energy		Gross Total Peak		Load Factor
Fiscal Year	(GW.h)	Growth (%)	(MW)	Growth (%)	(%)
2001/02	20656		3797		62.1%
2002/03	22110	7.0%	3948	4.0%	63.9%
2003/04	22069	-0.2%	3994	1.2%	63.1%
2004/05	22589	2.4%	4201	5.2%	61.4%
2005/06	22757	0.7%	4085	-2.8%	63.6%
2006/07	23464	3.1%	4208	3.0%	63.7%
2007/08	24122	2.8%	4304	2.3%	64.0%
2008/09	24417	1.2%	4509	4.8%	61.8%
2009/10	23412	-4.1%	4393	-2.6%	60.8%
2010/11	23892	2.1%	4286	-2.4%	63.6%
2011/12	23605	-1.2%	4367	1.9%	61.7%
2011/12 Wadj	24367	3.2%	4380	0.3%	63.5%
10 Year Avg Gr.	371	1.7%	58	1.4%	
2012/13	24961	2.4%	4491	2.5%	63.5%
2013/14	25734	3.1%	4609	2.6%	63.7%
2014/15	26071	1.3%	4677	1.5%	63.6%
2015/16	26393	1.2%	4738	1.3%	63.6%
2016/17	26677	1.1%	4794	1.2%	63.5%
2017/18	27128	1.7%	4874	1.7%	63.5%
2018/19	27616	1.8%	4959	1.8%	63.6%
2019/20	27919	1.1%	5024	1.3%	63.4%
2020/21	28400	1.7%	5109	1.7%	63.5%
2021/22	28859	1.6%	5192	1.6%	63.5%
10 Year Avg Gr.	449	1.7%	81	1.7%	
2022/23	29322	1.6%	5276	1.6%	63.4%
2023/24	29779	1.6%	5360	1.6%	63.4%
2024/25	30239	1.5%	5445	1.6%	63.4%
2025/26	30691	1.5%	5528	1.5%	63.4%
2026/27	31138	1.5%	5611	1.5%	63.4%
2027/28	31594	1.5%	5695	1.5%	63.3%
2028/29	32053	1.5%	5779	1.5%	63.3%
2029/30	32511	1.4%	5863	1.5%	63.3%
2030/31	32967	1.4%	5947	1.4%	63.3%
2031/32	33425	1.4%	6032	1.4%	63.3%
20 Year Avg Gr.	453	1.6%	83	1.6%	

Table 2 - Change in Energy and Peak

GROSS FIRM ENERGY AND GROSS TOTAL PEAK Change from Previous Forecast 2012/13 - 2031/32						
	Gross Firm Energy			Gross Total Peak		
Fiscal Year	2012 Forecast (GW.h)	2011 Forecast (GW.h)	Change (GW.h)	2012 Forecast (MW)	2011 Forecast (MW)	Change (MW)
2011/12 Act	23605			4367		
Weather Adj.	763			13		
2011/12 Wadj	24367	24615	(248)	4380	4557	(177)
2012/13	24961	25173	(212)	4491	4649	(158)
2013/14	25734	25930	(196)	4609	4767	(158)
2014/15	26071	26284	(213)	4677	4840	(164)
2015/16	26393	26406	(13)	4738	4888	(150)
2016/17	26677	26794	(117)	4794	4967	(173)
2017/18	27128	27205	(77)	4874	5050	(176)
2018/19	27616	27481	135	4959	5115	(156)
2019/20	27919	27966	(47)	5024	5203	(179)
2020/21	28400	28462	(61)	5109	5293	(184)
2021/22	28859	28887	(29)	5192	5374	(182)
10 Year	449	427		81	82	
Avg Gr.	1.7%	1.6%		1.7%	1.7%	
2022/23	29322	29311	11	5276	5455	(179)
2023/24	29779	29733	46	5360	5535	(175)
2024/25	30239	30153	86	5445	5615	(170)
2025/26	30691	30570	121	5528	5695	(167)
2026/27	31138	30984	155	5611	5773	(162)
2027/28	31594	31396	198	5695	5851	(156)
2028/29	32053	31801	252	5779	5928	(149)
2029/30	32511	32208	303	5863	6005	(142)
2030/31	32967	32608	359	5947	6081	(134)
19 Year	453	421	32	82	80	2
Avg Gr.	1.6%	1.5%	0.1%	1.6%	1.5%	0.1%

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INTRODUCTION

This document is prepared annually as Manitoba Hydro's forecast of its future load requirements for its service area. The service area consists of all of Manitoba (99.84% of sales), as well as two resale customers that supply energy to Creighton, Sask. (0.13% of sales) and the Northwest Angle, Minn. (0.03% of sales). Exports of power to other utilities are not included.

This information is provided for several purposes. Rate making and accounting require short term forecasts of sales by billing month within rate groups so they can forecast revenue. Operations and power planning require short and long term forecasts of energy and peak by calendar month so they can determine supply requirements.

A "customer" in this document usually refers to a metered electrical service. Unmetered services, such as flat rate water heating and sentinel rentals do not count as customers, and street lights group a number of services as one customer. A customer is not the same as a building. One building can have multiple electric services and may count as more than one customer, or multiple buildings may have only one service and may count as only one customer. A customer in this document is also not the same as a customer on the billing system. The latter is a person or organization that Manitoba Hydro serves. One billing customer may pay the bill for multiple services and thus count as multiple customers in this document.

Electric consumption is read from a customer's meter in units of kilowatt-hours (kW.h). A typical home not using electricity for heating might use 10,000 kW.h per year. This document reports electric use in terms of gigawatt-hours (GW.h). One GW.h equals one million kW.h, which is approximately the energy of 100 typical homes not using electricity for heating.

The highest load requirement for a time period is known as the peak load. It is given in terms of megawatts (MW). One MW equals one thousand kilowatts (kW). A typical home not using electricity for heating would use a maximum of about 2.5 kW sometime during the year. However, homes will not all be at their maximum use at the same hour. The maximum use at the same hour is known as the coincident load at the system peak hour. A typical home not using electricity for heating would use about 1.6 kW at the coincident peak. Therefore 1 MW is approximately the coincident peak requirement of 600 typical homes not using electricity for heating.

Components of Manitoba's Electricity Use – 2011/12

General Consumers Sales (also referred to as Total Sales) includes the energy supplied to all of Manitoba Hydro's individually billed customers. In 2011/12, Manitoba Hydro averaged 539,939 General Consumers Sales customers who used 20,771 GW.h.

The major groups include

(1) Residential Basic, with 450,748 customers who used 6,818 GW.h. These are mostly residences that include single-family homes, multi-family homes and apartment suites.
(2) General Service Mass Market, with 65,546 customers who used 8,162 GW.h. These are small to large Commercial and Industrial customers.
(3) General Service Top Consumers, with 32 customers who used 5,531 GW.h. These are 17 high-usage companies (some count as multiple customers) that are forecast individually.

The remaining customers include Seasonal customers (billed twice a year rather than monthly), Diesel customers (four remote towns not connected to the integrated grid system), Flat Rate Water Heating and Area and Roadway Lighting. Their use totals only 260 GW.h or 1% of Total Sales. Over 50,000 of these services do not count as customers.

Manitoba Load at Common Bus is the total load metered at all the substations in the province that supplies Manitoba Hydro's non-Diesel customers and includes Distribution Losses and Construction Power. In 2011/12, Common Bus was 21,560 GW.h or about 3.8% more than Total Sales.

Gross Firm Energy is the total load needed to be generated for domestic firm load requirements on the Integrated System (excludes diesel). It includes Transmission Losses and Station Service. Some customers are on non-firm contracts (Surplus Energy Program), and their load is not included as part of Manitoba Hydro's generation requirement. In 2011/12, Gross Firm Energy was 23,605 GW.h or about 9.5% more than Common Bus and 13.7% more than Total Sales.

Table 3 - Components of Manitoba Electricity Use

COMPONENTS OF MANITOBA ELECTRICITY USE 2011/12 (Customers, Consumption and Average Use)			
Forecast Group	**Cust/Serv**	**GW.h**	**kW.h/cust**
Residential Basic	450,748	6,818	15,125
Residential Diesel	568	8	13,941
Residential Seasonal	20,844	83	3,987
Residential Flat Rate Water Heating	4,310	22	5,088
Total Residential	**472,160**	**6,931**	
GS Mass Market	65,546	8,162	124,530
GS Top Consumers	32	5,531	175,134,063
GS Diesel	174	5	31,573
GS Seasonal	847	5	5,695
GS Flat Rate Water Heat	421	8	17,890
GS Surplus Energy Program	26	25	983,223
Total General Service	**66,624**	**13,737**	
Sentinal Flat Rate	20,033	11	569
Sentinal Rental	25,427	-	-
Street Lighting	1,155	91	79,233
Total Lighting	**1,155**	**103**	
Total General Consumer Sales	**539,939**	**20,771**	
Less Diesel Sales		(13)	
Distribution Losses		736	
Construction Power		67	
Manitoba Load at Common Bus		**21,560**	
Transmission Losses		1,939	
Less Non-Firm Energy		(25)	
Station Service		131	
Gross Firm Energy		**23,605**	
* flat rate and rental services are shown, which do not count as customers			

FORECAST OVERVIEW

General Consumers Customer Forecast

In 2011/12, there was an average of 539,939 General Consumer Sales customers. These were made up of 450,748 Residential Basic customers, 65,546 General Service Mass Market customers, 32 General Service Top Consumers customers, 26 SEP (Surplus Energy Program, ie. non-firm) customers, with the rest being Diesel, Seasonal and Area and Roadway Lighting.

During the last 10 years, Residential Basic customers have grown at an average of 3909 (0.9%) per year. Manitoba Hydro's 2012 Economic Outlook provides the forecast of Residential Basic customers, and this document uses that forecast. It calls for a growth of 6,301 (1.3%) per year over the next ten years and 6,290 (1.2%) per year over the next 20 years. The primary reason for the increase is an expectation of increased population growth in Manitoba due to government immigration initiatives which will impact both the Residential and Commercial Sectors.

General Service Mass Market customers have grown 546 (0.9%) per year over the last 10 years. They are forecast to grow 609 (0.9%) over the next ten years and 576 (0.8%) over the next 20 years.

Residential Seasonal customers, who are mainly cottages with low usage, are growing at a slower rate than residential basic averaging 58 (0.3%) customers per year over the last 10 years. They are forecast to grow at 84 (0.4%) over the next 10 years and 92 (0.4%) over the next 20 years.

Area and Roadway Lighting customers were re-grouped in 2006 when Manitoba Hydro changed its billing system, and the lighting customer counts changed at that time. Area and Roadway Lighting is expected to grow at 11 (0.9%) customers over the next 10 years and 10 (0.9%) over the next 20 years.

Manitoba Hydro purchased Winnipeg Hydro in September 2002. Their customers were integrated into the Manitoba Hydro billing system in June 2004. Historical customer and energy numbers in this document include Winnipeg Hydro customers.

Table 4 - General Consumers Sales Customers

GENERAL CONSUMERS SALES (Ave. Customers)
History and Forecast
2001/02 - 2031/32

Fiscal	Residential			General Service					Lighting	Total
Year	Basic	Diesel	Seas	Mass Mkt	Top Cons	Diesel	Seas	SEP		Custs
2001/02	411656	501	20263	60086	25	149	778	29	756	494243
2002/03	413812	499	20219	60265	26	148	786	33	755	496543
2003/04	416690	500	20056	60672	27	151	788	33	757	499674
2004/05	420135	508	20075	60924	26	160	793	31	759	503411
2005/06	423742	519	20145	61491	26	168	814	28	793	507726
2006/07	427886	525	20312	63596	26	169	783	28	1129	514454
2007/08	432144	531	20437	63855	26	175	798	27	1142	519135
2008/09	437263	540	20648	64140	26	178	818	24	1175	524812
2009/10	441710	539	20839	64758	26	177	830	24	1191	530094
2010/11	445882	550	20950	65193	26	176	842	24	1184	534827
2011/12	450748	568	20844	65546	32	174	847	26	1155	539940
10 Year	3909	7	58	546	1	3	7	0	40	4570
Avg Gr.	0.9%	1.3%	0.3%	0.9%	2.5%	1.6%	0.9%	-1.1%	4.3%	0.9%
2012/13	456280	572	20788	66074	31	175	854	29	1172	545975
2013/14	462217	578	20888	66669	31	177	859	29	1182	552630
2014/15	468515	585	20988	67302	31	178	864	29	1192	559684
2015/16	474877	591	21088	67943	31	180	869	29	1202	566810
2016/17	481292	598	21188	68591	32	182	874	29	1212	573998
2017/18	487750	605	21288	69242	32	184	879	29	1222	581231
2018/19	494239	611	21388	69873	32	186	884	29	1232	588474
2019/20	500745	618	21488	70475	32	187	889	29	1242	595705
2020/21	507256	624	21588	71058	32	189	894	29	1252	602922
2021/22	513760	631	21688	71635	32	191	899	29	1262	610127
10 Year	6301	6	84	609	0	2	5	0	11	7019
Avg Gr.	1.3%	1.1%	0.4%	0.9%	0.0%	0.9%	0.6%	1.1%	0.9%	1.2%
2022/23	520242	638	21788	72207	32	193	904	29	1272	617305
2023/24	526692	644	21888	72773	32	195	909	29	1282	624444
2024/25	533101	651	21988	73333	32	196	914	29	1292	631536
2025/26	539463	657	22088	73886	32	198	919	29	1302	638574
2026/27	545774	664	22188	74433	32	200	924	29	1312	645556
2027/28	552033	671	22288	74973	32	202	929	29	1322	652479
2028/29	558238	677	22388	75507	32	204	934	29	1332	659341
2029/30	564390	684	22488	76034	32	205	939	29	1342	666143
2030/31	570491	690	22588	76554	32	207	944	29	1352	672887
2031/32	576545	697	22688	77069	32	209	949	29	1362	679580
20 Year	6290	6	92	576	0	2	5	0	10	6982
Avg Gr.	1.2%	1.0%	0.4%	0.8%	0.0%	0.9%	0.6%	0.5%	0.8%	1.2%

General Consumers Sales Forecast

During 2011/12, Total General Consumer Sales was 20,771 GW.h. The mild winter resulted in a weather adjustment of 407 GW.h giving a weather adjusted Total Sales value of 21,177 GW.h.

During the last 10 years, Total Sales have grown at 337 GW.h (1.7%) per year. They are forecast to grow at 407 GW.h (1.8%) per year over the next 10 years and 404 GW.h (1.6%) over the next 20 years.

Most of the growth is forecast to occur in General Service Mass Market, growing 172 GW.h (1.9%) per year over the next ten years, followed by Residential Basic at 118 GW.h (1.5%) and Top Consumers at 116 (1.9%) per year.

Table 5 - General Consumers Sales Energy

GENERAL CONSUMERS SALES (GW.h) History and Forecast 2001/02 - 2031/32												
Fiscal	Residential				General Service						Lighting	Total
Year	Basic	Diesel	Seas	FRWH	Mass Mkt	Top Cons	Diesel	Seas	FRWH	SEP		Sales
2001/02	5674	6	49	37	7084	4818	5	4	14	24	89	17805
2002/03	6266	6	54	35	7467	5282	4	4	14	25	90	19246
2003/04	6170	6	56	34	7460	5423	5	5	13	17	91	19280
2004/05	6275	7	58	31	7516	5714	5	5	10	25	91	19735
2005/06	6171	7	59	30	7587	5948	5	5	9	23	91	19935
2006/07	6443	7	60	29	7839	5989	5	4	9	23	101	20510
2007/08	6736	7	68	27	8006	6075	5	4	9	24	101	21061
2008/09	6847	7	74	25	8049	6065	5	5	8	22	102	21210
2009/10	6786	7	81	24	7985	5461	6	5	8	20	102	20486
2010/11	6952	8	77	23	8258	5324	5	5	8	24	103	20786
2011/12	6818	8	83	22	8162	5531	5	5	8	25	103	20771
Weather Adj.	297	0	0	0	108	0	0	0	0	2	0	407
2011/12 Wadj	7114	8	83	22	8270	5531	5	5	8	28	103	21177
10 Year	144	0	3	-1	119	71	0	0	-1	0	1	337
Avg Gr.	2.3%	3.3%	5.4%	-5.0%	1.6%	1.4%	0.2%	1.2%	-6.2%	1.5%	1.5%	1.7%
2012/13	7227	8	85	21	8488	5821	6	5	7	27	104	21797
2013/14	7344	8	87	20	8643	6214	6	5	7	27	105	22465
2014/15	7467	8	90	19	8814	6208	6	5	6	27	106	22755
2015/16	7569	8	92	18	8986	6228	6	5	6	27	107	23050
2016/17	7662	9	94	17	9161	6223	6	5	6	27	108	23316
2017/18	7774	9	96	16	9336	6338	6	5	6	27	108	23721
2018/19	7900	9	98	15	9506	6478	6	5	5	27	109	24159
2019/20	8030	9	101	15	9670	6448	6	5	5	27	110	24425
2020/21	8161	9	103	14	9830	6578	6	5	5	27	111	24848
2021/22	8292	9	105	13	9989	6688	6	5	4	27	112	25251
10 Year	118	0	2	-1	172	116	0	0	0	0	1	407
Avg Gr.	1.5%	1.6%	2.4%	-5.0%	1.9%	1.9%	0.9%	0.6%	-5.1%	-0.5%	0.9%	1.8%
2022/23	8429	9	108	12	10147	6798	6	5	4	27	113	25659
2023/24	8577	10	110	12	10298	6898	6	5	4	27	114	26060
2024/25	8730	10	112	11	10447	6998	6	5	4	27	115	26465
2025/26	8877	10	115	11	10595	7098	6	5	4	27	116	26862
2026/27	9021	10	117	10	10741	7198	6	5	3	27	117	27256
2027/28	9167	10	119	10	10892	7298	6	5	3	27	118	27656
2028/29	9315	10	122	9	11045	7398	6	5	3	27	119	28059
2029/30	9463	10	124	9	11197	7498	6	5	3	27	120	28462
2030/31	9611	11	127	8	11347	7598	7	5	3	27	121	28863
2031/32	9760	11	129	8	11497	7698	7	5	3	27	122	29266
20 Year	132	0	2	-1	161	108	0	0	0	0	1	404
Avg Gr.	1.6%	1.6%	2.2%	-5.0%	1.7%	1.7%	0.9%	0.6%	-5.0%	-0.2%	0.8%	1.6%

Manitoba Energy Forecast

The actual Gross Firm Energy was 23,605 GW.h in 2011/12. Gross Firm Energy has grown 371 GW.h (1.7%) per year for the past 10 years. It is forecast to grow to 33,425 GW.h by 2031/32 at an average growth of 453 GW.h or 1.6% per year.

Distribution losses, which is the difference between the substations and the customers' meter, has a wide variance from year to year and has ranged between 3.5% and 5.0% of Total Sales. It is forecast to be 4.4% of Sales for the entire forecast.

Transmission Losses which is the difference between the generators and the substations is forecast to be 9.3% of Total Sales for the entire forecast.

Distribution Losses, Transmission Losses, Construction and Station Service amount to an additional 14% that needs to be added to Total Sales to estimate Gross Firm Energy. This 14% value should generally be used to estimate load at generation when only load at the customer's meter is known, for example to convert Power Smart program savings from the customer meter to generation. The exception is for large General Service customers who own their own transformation and thus do not incur Distribution Losses. For them, a 10% value should be used.

Table 6 - Components of Manitoba Energy

MANITOBA FIRM ENERGY (GW.h)
History and Forecast
2001/02 - 2031/32

Fiscal Year	General Consumer Sales less Diesel	Dist. Losses	Dist. Loss %	Const. Power	Manitoba Load at Common Bus	Trans. Losses	Trans. Loss %	Less Non Firm Energy	Station Service	Gross Firm Energy
2001/02	17793	819	4.6%	42	18655	1864	10.5%	25	162	20656
2002/03	19236	671	3.5%	46	19953	2012	10.5%	24	170	22110
2003/04	19269	804	4.2%	43	20116	1792	9.3%	17	179	22069
2004/05	19724	830	4.2%	46	20600	1852	9.4%	26	163	22589
2005/06	19923	797	4.0%	42	20761	1860	9.3%	23	158	22757
2006/07	20497	900	4.4%	45	21442	1885	9.2%	22	159	23464
2007/08	21049	940	4.5%	47	22036	1949	9.3%	24	161	24122
2008/09	21198	1052	5.0%	56	22305	1979	9.3%	22	154	24417
2009/10	20473	813	4.0%	75	21361	1934	9.4%	20	137	23412
2010/11	20773	947	4.6%	85	21806	1977	9.5%	25	134	23892
2011/12	20757	736	3.5%	67	21560	1939	9.3%	25	131	23605
Weather Adj.	407	296		8	711	46		3	9	763
2011/12 Wadj	21164	1032	4.9%	75	22271	1984	9.4%	28	140	24367
10 Year	337	21		3	362	12		0	-2	371
Avg Gr.	1.7%	2.3%		5.9%	1.8%	0.6%		1.1%	-1.4%	1.7%
2012/13	21784	950	4.4%	78	22812	2034	9.3%	27	141	24961
2013/14	22451	980	4.4%	88	23520	2097	9.3%	27	144	25734
2014/15	22741	993	4.4%	95	23829	2125	9.3%	27	144	26071
2015/16	23036	1007	4.4%	82	24125	2151	9.3%	27	144	26393
2016/17	23302	1019	4.4%	65	24385	2174	9.3%	27	144	26677
2017/18	23706	1037	4.4%	56	24799	2211	9.3%	27	144	27128
2018/19	24144	1056	4.4%	47	25248	2251	9.3%	27	144	27616
2019/20	24410	1068	4.4%	47	25526	2276	9.3%	27	144	27919
2020/21	24833	1087	4.4%	47	25968	2315	9.3%	27	144	28400
2021/22	25236	1105	4.4%	47	26389	2353	9.3%	27	144	28859
10 Year	407	7		-3	412	37		0	0	449
Avg Gr.	1.8%	0.7%		-4.5%	1.7%	1.7%		-0.5%	0.2%	1.7%
2022/23	25643	1124	4.4%	47	26814	2391	9.3%	27	144	29322
2023/24	26044	1142	4.4%	47	27234	2428	9.3%	27	144	29779
2024/25	26449	1160	4.4%	47	27656	2466	9.3%	27	144	30239
2025/26	26846	1178	4.4%	47	28071	2503	9.3%	27	144	30691
2026/27	27239	1195	4.4%	47	28482	2539	9.3%	27	144	31138
2027/28	27639	1213	4.4%	47	28900	2577	9.3%	27	144	31594
2028/29	28042	1231	4.4%	47	29321	2614	9.3%	27	144	32053
2029/30	28445	1249	4.4%	47	29742	2652	9.3%	27	144	32511
2030/31	28846	1268	4.4%	47	30161	2689	9.3%	27	144	32967
2031/32	29248	1286	4.4%	47	30581	2727	9.3%	27	144	33425
20 Year	404	13		-1	416	37		0	0	453
Avg Gr.	1.6%	1.1%		-2.3%	1.6%	1.6%		-0.3%	0.1%	1.6%

COMPARISON WITH THE 2011 FORECAST

Comparison of the 2011 Forecast to the 2011/12 Weather Adjusted Actuals

The 2011 forecast of Sales for 2011/12 was 20,771 GW.h, and the forecast for Gross Firm Energy was 23,605 GW.h.

2011/12 was a record warm year. The twelve month period from April 2011 to March 2012 had 3,678 DDH (Degree Days Heating) compared to the prior 25-year normal of 4,537 DDH. This warm weather led to a weather adjustment of 407 GW.h on actual General Consumer Sales. 297 GW.h was applied to Residential, 108 GW.h was applied to General Service Mass Market and 2 GW.h was General Service Surplus Energy Program.

The overall weather adjustment for Gross Firm Energy was 763 GW.h. Most of the difference between the Gross Firm Energy weather adjustment and the Sales weather adjustment is due to the extraordinarily warm March. From March 15 to March 31 of 2012, there were only 116 DDH compared to the same period in 2011 which had 298 DDH. Distribution losses takes into account the conversion from billing periods (Sales) to calendar months (Common Bus), and that difference is captured in its high weather adjustment value of 296 GW.h.

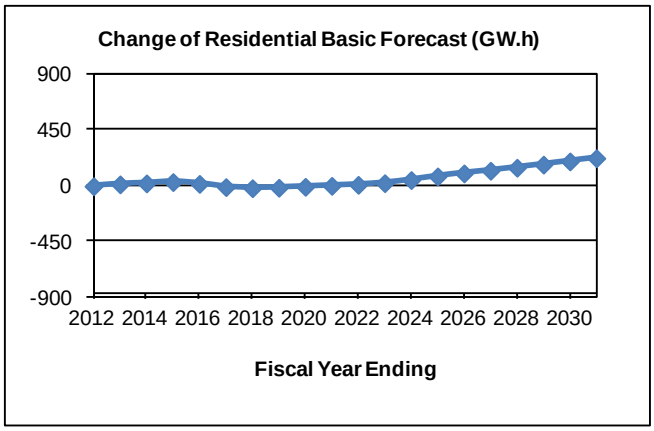
The 2011/12 weather adjusted actuals for Sales were 335 GW.h lower than the 2011 Sales forecast. The Residential sector only varied by less than 1 GW.h. General Service Mass Market was 138 GW.h lower, and General Service Top Consumers was 199 GW.h lower. Distribution Losses were 116 higher than forecast, resulting in Gross Firm Energy being 248 GW.h lower than forecast.

Table 7 - 2011/12 Forecast to Actual

2011 FORECAST COMPARED TO WEATHER ADJUSTED ACTUALS 2011/12 (GW.h)					
Forecast Group	**Actuals**	**Weather Adjustment**	**Wthr Adj Actuals**	**2011 Forecast**	**WA Actuals less Forecast**
Residential Basic	**6,818**	**297**	**7,114**	**7,118**	**(4)**
Residential Diesel	**8**	**-**	**8**	**8**	**0**
Residential Seasonal	**83**	**-**	**83**	**79**	**4**
Residential Flat Rate Water Heating	**22**	**-**	**22**	**22**	**0**
Total Residential	**6,931**	**297**	**7,227**	**7,227**	**0**
GS Mass Market	**8,162**	**108**	**8,270**	**8,408**	**(138)**
GS Top Consumers	**5,531**	**-**	**5,531**	**5,730**	**(199)**
GS Diesel	**5**	**-**	**5**	**5**	**0**
GS Seasonal	**5**	**-**	**5**	**5**	**0**
GS Flat Rate Water Heat	**8**	**-**	**8**	**7**	**0**
GS Surplus Energy Program	**25**	**2**	**28**	**26**	**2**
Total General Service	**13,737**	**110**	**13,847**	**14,182**	**(335)**
Sentinal Flat Rate	**11**	**-**	**11**	**11**	**(0)**
Sentinal Rental	**-**	**-**	**-**	**-**	**-**
Street Lighting	**91**	**-**	**91**	**92**	**(1)**
Total Lighting	**103**	**-**	**103**	**104**	**(1)**
Total General Consumer Sales	**20,771**	**407**	**21,177**	**21,513**	**(335)**
Less Diesel Sales	**(13)**	**-**	**(13)**	**(13)**	**(0)**
Distribution Losses	**736**	**296**	**1,032**	**916**	**116**
Construction Power	**67**	**8**	**75**	**98**	**(23)**
Manitoba Load at Common Bus	**21,560**	**711**	**22,271**	**22,513**	**(242)**
Transmission Losses	**1,939**	**46**	**1,984**	**1,988**	**(4)**
Less Non-Firm Energy	**(25)**	**(3)**	**(28)**	**(26)**	**(2)**
Station Service	**131**	**9**	**140**	**140**	**0**
Gross Firm Energy	**23,605**	**763**	**24,367**	**24,615**	**(248)**

Change Between the 2011 and 2012 Residential Basic Forecast

Figure 1 - Change of Res Basic Forecast



The Residential Basic Forecast is up from the 2011 forecast. By 2030/31 the difference is 222 GW.h or 2.4%. This is equivalent to about 1/2 year of Manitoba system load growth (1 year = approximately 450 GW.h).

Changes made (and the 2030/31 effect):

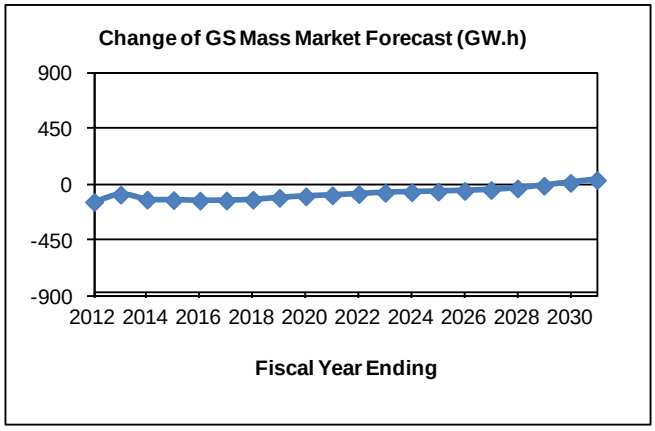
1. The forecast of the number of customers was increased by 15,349 customers (+283 GW.h).
2. The number of existing customers switching from natural gas heat to electric heat increased to 250 customers per year (+35 GW.h).
3. The number of new customers installing electric heat increased due to a lower projected rise of electric rates in the forecast (+45 GW.h).
4. More growth forecast in Winnipeg compared to outside Winnipeg with adjustment to growths by single, multi-res and apartment (-66 GW.h).
5. Updated End Use model parameters (-33 GW.h)
6. Change to the forecast of electric vehicles (-42 GW.h).

Table 8 - Change of Res Basic Forecast

CHANGE OF RESIDENTIAL BASIC FORECAST (GW.h) Comparison of 2011 to 2012 forecast										
Fiscal Year	2011 Fcst	2012 Fcst	Change	%		Fiscal Year	2011 Fcst	2012 Fcst	Change	%
2011/12	7118	7114	(4)	-0.1%		2021/22	8285	8292	7	0.1%
2012/13	7216	7227	11	0.2%		2022/23	8408	8429	21	0.2%
2013/14	7326	7344	19	0.3%		2023/24	8531	8577	46	0.5%
2014/15	7438	7467	30	0.4%		2024/25	8654	8730	75	0.9%
2015/16	7554	7569	15	0.2%		2025/26	8777	8877	100	1.1%
2016/17	7673	7662	(11)	-0.1%		2026/27	8900	9021	121	1.4%
2017/18	7794	7774	(20)	-0.3%		2027/28	9022	9167	145	1.6%
2018/19	7916	7900	(16)	-0.2%		2028/29	9145	9315	170	1.9%
2019/20	8039	8030	(9)	-0.1%		2029/30	9266	9463	196	2.1%
2020/21	8162	8161	(1)	0.0%		2030/31	9389	9611	222	2.4%

Change Between the 2011 and 2012 GS Mass Market Forecast

Figure 2 - Change of GS Mass Market Forecast



The General Service Mass Market Forecast starts off down from 2011 forecast. By 2030/31 the difference is up 39 GW.h or 0.3%. This is not significant in terms of Manitoba system load growth (1 year = approximately 450 GW.h).

Changes made (and the 2030/31 effect):

1. The residential customer forecast was higher leading to an increase in the GS Mass Market (+340 GW.h).
2. The GDP forecast from the 2012 Economic Outlook was lower than in 2011 (-65 GW.h).
3. Model changes to better estimate customers and average use by size class and re-estimation of the model parameters using an additional year of data (-166 GW.h).
4. Additional Codes and Standards related to adjustments in the participation and per unit impacts in Commercial ighting use were included (-49 GW.h).
5. Change to the forecast of electric vehicles (-21 GW.h).

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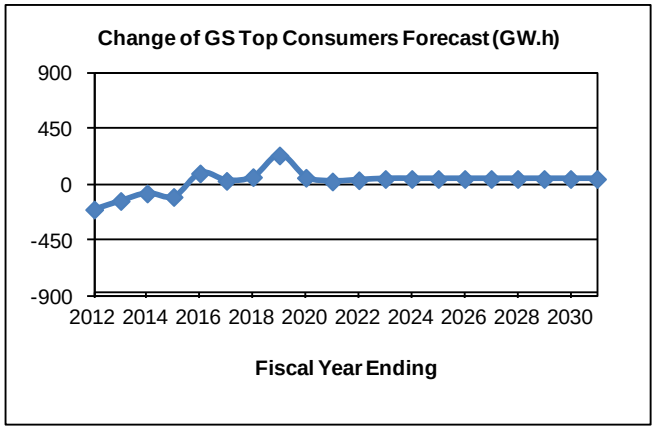
Table 9 - Change of GS Mass Market Forecast

CHANGE OF GS MASS MARKET FORECAST (GW.h) Comparison of 2011 to 2012 forecast										
Fiscal Year	2011 Fcst	2012 Fcst	Change	%		Fiscal Year	2011 Fcst	2012 Fcst	Change	%
2011/12	8408	8270	(138)	-1.6%		2021/22	10063	9989	(74)	-0.7%
2012/13	8566	8488	(79)	-0.9%		2022/23	10211	10147	(64)	-0.6%
2013/14	8762	8643	(119)	-1.4%		2023/24	10357	10298	(59)	-0.6%
2014/15	8937	8814	(123)	-1.4%		2024/25	10502	10447	(55)	-0.5%
2015/16	9113	8986	(127)	-1.4%		2025/26	10643	10595	(49)	-0.5%
2016/17	9287	9161	(126)	-1.4%		2026/27	10783	10741	(42)	-0.4%
2017/18	9456	9336	(120)	-1.3%		2027/28	10921	10892	(29)	-0.3%
2018/19	9611	9506	(104)	-1.1%		2028/29	11052	11045	(7)	-0.1%
2019/20	9763	9670	(93)	-1.0%		2029/30	11181	11197	16	0.1%
2020/21	9914	9830	(84)	-0.9%		2030/31	11308	11347	39	0.3%

Change Between the 2011 and 2012 GS Top Consumers Forecast

Figure 3 - Change of GS Top Consumer Forecast



The General Service Top Consumers is down 130 GW.h in 2012/13 but by 2022/23 the difference in the forecasts is up 48 GW.h. This is not significant in terms of Manitoba system load growth (1 year = approximately 450 GW.h).

Changes made (and the 2030/31 effect):

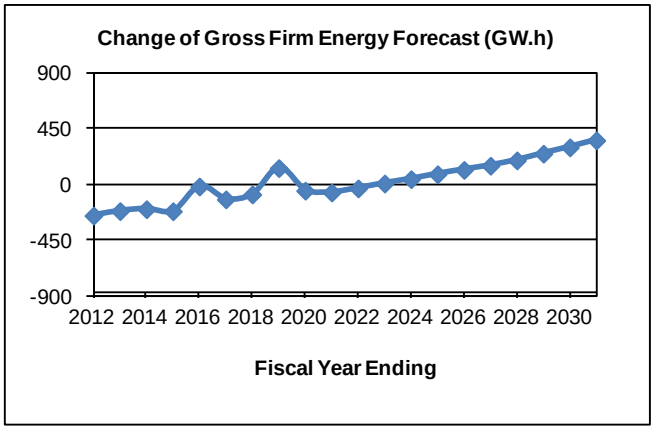
1. One top consumer's forecast for 2030/31 was raised 135 GW.h. Two others were raised by an average of 72 GW.h and one other was lowered by 80 GW.h (+200 GW.h).
2. The BioEnergy Optimization Program was removed (-85 GW.h).
3. Potential Large Industrial Loads begins in the 4th year of the forecast, which in the 2012 forecast is one year later giving one less year of PLIL growth (-100 GW.h).
4. Changes to the forecasts of the other top consumers (+33 GW.h).

Table 10 - Change of GS Top Consumer Forecast

CHANGE OF GS TOP CONSUMERS FORECAST (GW.h) Comparison of 2011 to 2012 forecast										
Fiscal Year	2011 Fcst	2012 Fcst	Change	%		Fiscal Year	2011 Fcst	2012 Fcst	Change	%
2011/12	5730	5531	(199)	-3.5%		2021/22	6651	6688	38	0.6%
2012/13	5951	5821	(130)	-2.2%		2022/23	6751	6798	48	0.7%
2013/14	6284	6214	(70)	-1.1%		2023/24	6851	6898	48	0.7%
2014/15	6306	6208	(98)	-1.5%		2024/25	6951	6998	48	0.7%
2015/16	6136	6228	93	1.5%		2025/26	7051	7098	48	0.7%
2016/17	6191	6223	33	0.5%		2026/27	7151	7198	48	0.7%
2017/18	6276	6338	63	1.0%		2027/28	7251	7298	48	0.7%
2018/19	6241	6478	238	3.8%		2028/29	7351	7398	48	0.6%
2019/20	6391	6448	58	0.9%		2029/30	7451	7498	48	0.6%
2020/21	6551	6578	28	0.4%		2030/31	7551	7598	48	0.6%

Change Between the 2011 and 2012 Gross Firm Energy Forecast

Figure 4 - Change of Energy Forecast



The Gross Firm Energy forecast is down 212 GW.h in 2012/13 due to initial-year decreases to the GS Mass Market and GS Top Consumers forecasts. This difference narrows due to the increased forecast of customers and by 2020/21 the forecast is down only 61 GW.h. By 2030/31, the Gross Firm Energy forecast is up 359 GW.h (1.1%) which is equivalent to 3/4 of a year of load growth (1 year = approximately 450 GW.h).

Changes made (and the 2030/31 effect):

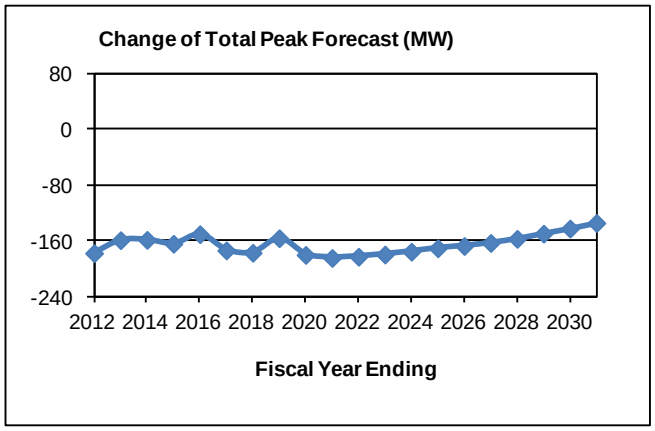
1. Residential Basic forecast (+222 GW.h), primarily due to the increase in the forecast of customers (+283 GW.h).
2. General Service Mass Market forecast (+39 GW.h), affected by the increase in the forecast of customers (+340 GW.h) but largely offset by decreases due to GDP, modeling, Codes and Standards and Electric Vehicles.
3. General Service Top Consumers forecast (+48 GW.h). This is the net change of the 17 consumers individually forecast.
4. Other Sales and Losses (+50 GW.h).

Table 11 - Change of Energy Forecast

GROSS FIRM ENERGY (GW.h) Comparison of 2011 to 2012 forecast										
Fiscal Year	2011 Fcst	2012 Fcst	Change	%		Fiscal Year	2011 Fcst	2012 Fcst	Change	%
2011/12	24615	24367	(248)	-1.0%		2021/22	28887	28859	(29)	-0.1%
2012/13	25173	24961	(212)	-0.8%		2022/23	29311	29322	11	0.0%
2013/14	25930	25734	(196)	-0.8%		2023/24	29733	29779	46	0.2%
2014/15	26284	26071	(213)	-0.8%		2024/25	30153	30239	86	0.3%
2015/16	26406	26393	(13)	0.0%		2025/26	30570	30691	121	0.4%
2016/17	26794	26677	(117)	-0.4%		2026/27	30984	31138	155	0.5%
2017/18	27205	27128	(77)	-0.3%		2027/28	31396	31594	198	0.6%
2018/19	27481	27616	135	0.5%		2028/29	31801	32053	252	0.8%
2019/20	27966	27919	(47)	-0.2%		2029/30	32208	32511	303	0.9%
2020/21	28462	28400	(61)	-0.2%		2030/31	32608	32967	359	1.1%

Change Between the 2011 and 2012 Gross Total Peak Forecast

Figure 5 - Change of Peak Forecast



The Gross Total Peak forecast is down 158 MW in 2012/13 which is a significant drop of 2 years of peak growth (1 year = approximately 80 MW). The reason for the large drop was a correction to the Distribution Losses calculation for the peak. This resulted in a decrease to the peak forecast of 135 MW in 2012/13, 151 MW in 2020/21 and 171 MW in 2030/31. After modifying the peak to reflect changes in the energy forecast, final changes to the peak forecast were down 158 MW in 2012/13, down 184 MW by 2020/21 and down 134 MW by 2030/31.

In the 2011 forecast, Distribution Losses were determined by subtracting hourly estimates of sales in the various sectors from the hourly Common Bus figures. These differences used for the Distribution Losses were found to not be reliable on an hourly basis. For the 2011 forecast, they resulted in a calculation of Distribution Losses at peak to be 7.9% of Sales. For the 2012 forecast, this was revised updated to be 4.5% of Sales which is the five year average of annual Distribution Losses.

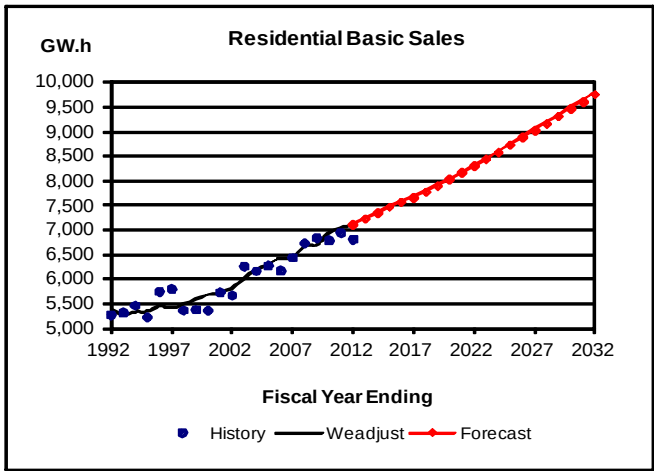
Table 12 - Change of Peak Forecast

GROSS TOTAL PEAK (MW) Comparison of 2011 to 2012 forecast										
Fiscal Year	2011 Fcst	2012 Fcst	Change	%		Fiscal Year	2011 Fcst	2012 Fcst	Change	%
2011/12	4557	4380	(177)	-3.9%		2021/22	5374	5192	(182)	-3.4%
2012/13	4649	4491	(158)	-3.4%		2022/23	5455	5276	(179)	-3.3%
2013/14	4767	4609	(158)	-3.3%		2023/24	5535	5360	(175)	-3.2%
2014/15	4840	4677	(164)	-3.4%		2024/25	5615	5445	(170)	-3.0%
2015/16	4888	4738	(150)	-3.1%		2025/26	5695	5528	(167)	-2.9%
2016/17	4967	4794	(173)	-3.5%		2026/27	5773	5611	(162)	-2.8%
2017/18	5050	4874	(176)	-3.5%		2027/28	5851	5695	(156)	-2.7%
2018/19	5115	4959	(156)	-3.0%		2028/29	5928	5779	(149)	-2.5%
2019/20	5203	5024	(179)	-3.4%		2029/30	6005	5863	(142)	-2.4%
2020/21	5293	5109	(184)	-3.5%		2030/31	6081	5947	(134)	-2.2%

FORECAST DETAILS

Residential Basic

Figure 6- Residential Basic Sales



The Residential Basic group is made up of single detached and multi-family dwellings as well as individually metered apartment suites.

The Residential Basic group had minimal growth during the 1990's but growth has been steady since about 1999. During the last 20 years, weather adjusted Residential consumption has been growing at 87 GW.h or 1.4% per year

Over the forecast period, the Residential Basic group is expected to increase by 132 GW.h or 1.6% per year. This is primarily due to anticipated growth in the number of customers averaging 6,290 new customers over the next 20 years. In addition, the market share of electric heat customers is expected to increase from 35.7% in 2011/12 to 40.6% in 2031/32, and the average use of non-electric heat customers is expected to rise due to increases in electric water heating and miscellaneous end uses.

Table 13 - Residential Sales

RESIDENTIAL BASIC (GW.h)
HISTORICAL/WEATHER ADJUSTMENT/FORECAST

Fiscal Year	Sales	Weather Adjust	Adjusted Sales	Fiscal Year	Forecast Sales
1992/93	5317	-54	5262	2012/13	7227
1993/94	5467	-145	5322	2013/14	7344
1994/95	5230	97	5327	2014/15	7467
1995/96	5753	-309	5444	2015/16	7569
1996/97	5797	-395	5402	2016/17	7662
1997/98	5370	101	5471	2017/18	7774
1998/99	5384	202	5586	2018/19	7900
1999/00	5364	306	5670	2019/20	8030
2000/01	5737	-39	5699	2020/21	8161
2001/02	5674	129	5802	2021/22	8292
2002/03	6266	-266	6000	2022/23	8429
2003/04	6170	-2	6169	2023/24	8577
2004/05	6275	10	6285	2024/25	8730
2005/06	6171	251	6421	2025/26	8877
2006/07	6443	-21	6421	2026/27	9021
2007/08	6736	-83	6653	2027/28	9167
2008/09	6847	-159	6688	2028/29	9315
2009/10	6786	130	6917	2029/30	9463
2010/11	6952	78	7030	2030/31	9611
2011/12	6818	297	7114	2031/32	9760

Table 14 - Residential Basic Sales

RESIDENTIAL BASIC SALES
History and Forecast
2011/12 - 2031/32

Fiscal Year	Electric Heat Billed			Other			Total Basic			% Elec Space Heat	% Elec Water Tanks
	Custs	GW.h	kW.h/cust	Custs	GW.h	kW.h/cust	Custs	GW.h	kW.h/cust		
2011/12	161078	3910	24273	289670	2908	10038	450748	6818	15125	35.7%	47.3%
2012/13	164166	4156	25316	292114	3071	10512	456280	7227	15839	36.0%	48.6%
2013/14	167665	4228	25215	294552	3117	10581	462217	7344	15890	36.3%	50.2%
2014/15	171358	4304	25117	297157	3163	10644	468515	7467	15938	36.6%	51.7%
2015/16	175111	4371	24960	299766	3198	10667	474877	7569	15938	36.9%	53.1%
2016/17	178901	4434	24784	302391	3228	10675	481292	7662	15920	37.2%	54.5%
2017/18	182714	4511	24691	305037	3263	10696	487751	7774	15939	37.5%	55.8%
2018/19	186536	4598	24648	307703	3302	10732	494239	7900	15984	37.7%	57.0%
2019/20	190355	4686	24616	310390	3344	10775	500745	8030	16036	38.0%	58.1%
2020/21	194165	4774	24587	313092	3387	10818	507257	8161	16088	38.3%	59.1%
2021/22	197955	4862	24560	315805	3430	10863	513760	8292	16140	38.5%	60.1%
2022/23	201721	4952	24547	318521	3477	10917	520242	8429	16202	38.8%	61.1%
2023/24	205458	5043	24544	321234	3535	11003	526692	8577	16285	39.0%	62.4%
2024/25	209162	5134	24545	323939	3596	11100	533101	8730	16375	39.2%	63.8%
2025/26	212837	5225	24548	326626	3652	11181	539463	8877	16455	39.5%	64.9%
2026/27	216488	5315	24551	329286	3706	11254	545774	9021	16528	39.7%	65.7%
2027/28	220113	5406	24562	331920	3761	11331	552033	9167	16607	39.9%	66.4%
2028/29	223712	5498	24576	334526	3817	11410	558238	9315	16686	40.1%	67.1%
2029/30	227286	5589	24588	337105	3874	11492	564391	9463	16766	40.3%	67.8%
2030/31	230835	5679	24601	339656	3932	11577	570491	9611	16847	40.5%	68.4%
2031/32	234363	5768	24612	342182	3992	11666	576545	9760	16929	40.6%	69.1%

Electric Heat Billed: Customers who have electric space heating included with their electric bill.

Other: Customers who do not have electric space heating included with their electric bill.

% Elec Space Heat: The proportion of Total Basic customers who are Electric Heat Billed.

% Elec Water Tanks: The proportion of Total Basic customers who have Electric Water Heaters.

Note: Average use (kW.h/cust) for Electric Heat Billed and Other homes is a blended average of single detached dwellings, multi-family dwellings, and apartments.

Residential Diesel, Seasonal, and Flat Rate Water Heating

Residential Diesel

There were 568 Residential Diesel customers that used 8 GW.h in 2011/12 at an average of 13,941 kW.h per customer. They have 60 amp service that does not allow for electric heating. The number of customers is expected to grow to 697 and usage is expected to increase to 11 GW.h by 2031/32 under the assumption that they will remain as Diesel sites.

Residential Seasonal

There were 20,844 Residential Seasonal customers in 2011/12. The number of customers is expected increase to 22,688 customers by 2031/32. Seasonal customers are billed only twice a year either due to low usage (being a seasonal residence or cottage) or because of a location that makes it difficult to access for more frequent meter readings. The average use of a seasonal customer is 3,987 kW.h per year. The usage of Residential Seasonal customers is expected to grow at 2.2% a year to 129 GW.h in 2031/32.

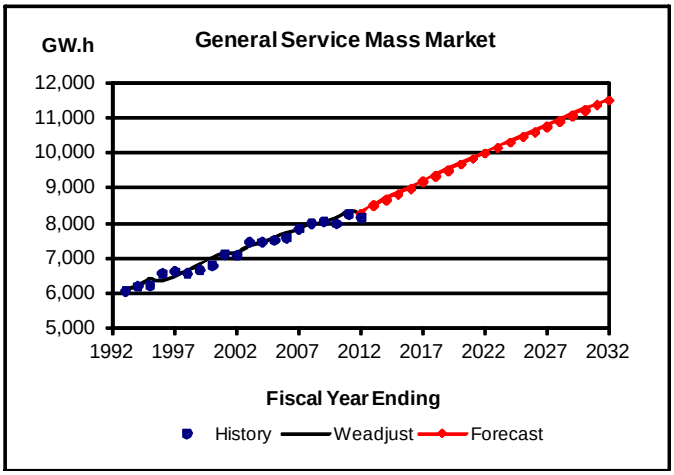
Residential Flat Rate Water Heating

Residential Water Heating is a flat rate unmetered service. This service has not been available to new customers since November 12, 1969. There were 4,310 remaining services in 2011/12. The number of services is expected to decrease 5% per year throughout the forecast period. Usage was 22 GW.h in 2011/12 and that will decrease to 8 GW.h by 2031/32.

General Service Mass Market

General Service Mass Market includes all Commercial and Industrial customers, excluding the General Service Top Consumers. Approximately 85% of the GS Mass Market customers are Commercial and the others are Industrial.

Figure 7 - General Service Mass Market



GS Mass Market has grown steadily throughout the last twenty years. This load generally does not fluctuate dramatically since the commercial and small industrial infrastructure is established, continues to grow slowly and is minimally affected by economic booms or busts.

GS Mass Market is forecast to increase from a weather adjusted value of 8,270 GW.h in 2011/12 to 11,497 GW.h by 2031/32. This represents an average growth of 161 GW.h or 1.7% per year.

Table 15 - General Service Mass Market

GENERAL SERVICE MASS MARKET (GW.h) HISTORICAL/WEATHER ADJUSTMENT/FORECAST					
Fiscal Year	Sales	Weather Adjust	Adjusted Sales	Fiscal Year	Forecast Sales
1992/93	6077	6	6083	2012/13	8488
1993/94	6210	-59	6151	2013/14	8643
1994/95	6233	123	6356	2014/15	8814
1995/96	6573	-258	6314	2015/16	8986
1996/97	6627	-192	6435	2016/17	9161
1997/98	6562	54	6616	2017/18	9336
1998/99	6668	109	6777	2018/19	9506
1999/00	6796	189	6985	2019/20	9670
2000/01	7110	8	7118	2020/21	9830
2001/02	7084	53	7137	2021/22	9989
2002/03	7467	-135	7332	2022/23	10147
2003/04	7460	-15	7445	2023/24	10298
2004/05	7516	42	7558	2024/25	10447
2005/06	7587	117	7704	2025/26	10595
2006/07	7839	-38	7801	2026/27	10741
2007/08	8006	-46	7960	2027/28	10892
2008/09	8049	-43	8005	2028/29	11045
2009/10	7985	116	8101	2029/30	11197
2010/11	8258	64	8322	2030/31	11347
2011/12	8162	108	8270	2031/32	11497

General Service Top Consumers

General Service Top Consumers includes the top energy consuming businesses in Manitoba and represents 26% of all General Consumers Sales. GS Top Consumers includes 17 consumers (companies) that account for 31 customers in the Primary Metals, Chemicals, Petrol/Oil/Natural Gas, Pulp/Paper, Food/Beverage and Colleges/Universities sectors.

Figure 8 - General Service Top Consumers

GS Top Consumers has grown considerably over the last twenty years. This group is very sensitive to economic conditions, clearly demonstrated by the drop in usage during the economic downturns of 1999/00 and 2009/10. Despite the expected loss of a major load by 2016, GS Top Consumers is expected to return to normal growth due to its widely diversified market.

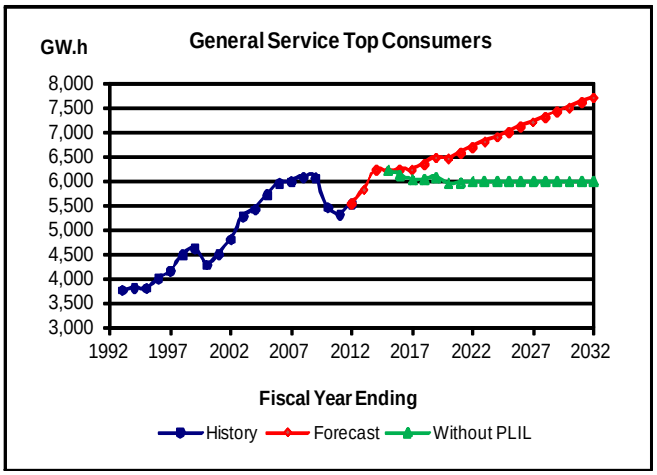


Table 16 - General Service Top Consumers

GENERAL SERVICE TOP CONSUMERS (GW.h) HISTORICAL/FORECAST WITH PLIL					
Fiscal Year	Sales	Fiscal Year	Individual	PLIL	Total
1992/93	3783	2012/13	5821	0	5821
1993/94	3836	2013/14	6214	0	6214
1994/95	3825	2014/15	6208	0	6208
1995/96	4021	2015/16	6128	100	6228
1996/97	4173	2016/17	6023	200	6223
1997/98	4493	2017/18	6038	300	6338
1998/99	4632	2018/19	6078	400	6478
1999/00	4299	2019/20	5948	500	6448
2000/01	4515	2020/21	5978	600	6578
2001/02	4818	2021/22	5988	700	6688
2002/03	5282	2022/23	5998	800	6798
2003/04	5423	2023/24	5998	900	6898
2004/05	5714	2024/25	5998	1000	6998
2005/06	5948	2025/26	5998	1100	7098
2006/07	5989	2026/27	5998	1200	7198
2007/08	6075	2027/28	5998	1300	7298
2008/09	6065	2028/29	5998	1400	7398
2009/10	5461	2029/30	5998	1500	7498
2010/11	5324	2030/31	5998	1600	7598
2011/12	5531	2031/32	5998	1700	7698

GS Top Consumers are forecast individually as their usage does not grow in a slow, steady, predictable pattern. These types of load changes are not conducive to econometric forecasting models and must be examined on an individual basis. The forecast for each company includes their short term committed plans and expectations over the next several years, but excludes longer term plans that are uncommitted and subject to change.

The sum of the individual company forecasts start at 5,531 GW.h in 2011/12 and grow to 6,038 GW.h by 2017/18, in only six years. This is an overall growth of 507 GW.h despite including the expected major load decrease by 2016 for one customer.

For the longer term, the average expected growth is included for all customers together. This added growth is called Potential Large Industrial Loads (PLIL). It includes consideration for company expansions, cutbacks and shutdowns, new startups of 50 GW.h a year or more, and the long term normal incremental growth of all the companies combined. Since short term customer intentions are known, PLIL is not added to the first three years of the forecast. PLIL is added beginning in 2015/16.

Potential Large Industrial Loads are forecast to be 100 GW.h per year. In the past 20 years, there have been 14 major increases of load of 100 GW.h or more, and 2 major losses of load of 100 GW.h or more to General Service Top Consumers. The net effect has been an addition of about 85 GW.h per year. Normal company growth has added another 7 GW.h per year. The combined effect is that GS Top Consumers has grown from 3,783 GW.h in 1992/93 to 5,531 GW.h in 2011/12, a growth of 92 GW.h or 2.0% per year.

By 2031/32, the total contribution of PLIL is forecast to be 1,700 GW.h. This is approximately equivalent to the load of Manitoba Hydro's largest consumer. If only one other customer of similar size starts up in Manitoba in the next 20 years, this one new customer alone will consume all of the provision that PLIL has allowed.

Including Potential Large Industrial Loads, GS Top Consumers is forecast to grow from 5,531 GW.h in 2011/12 to 7,698 GW.h in 2031/32, for an average growth of 108 GW.h or 1.7% per year.

General Service Diesel, Seasonal, and Flat Rate Water Heat

General Service Diesel

In 2011/12, there were 174 General Service Diesel Full Cost customers. They used 5 GW.h in 2011/12. The group is forecast to use 7 GW.h by 2031/32.

General Service Seasonal

There were 847 General Service Seasonal customers in 2011/12. Consumption was 5 GW.h in 2011/12 and is expected to remain at 5 GW.h by 2031/32.

General Service Flat Rate Water Heating

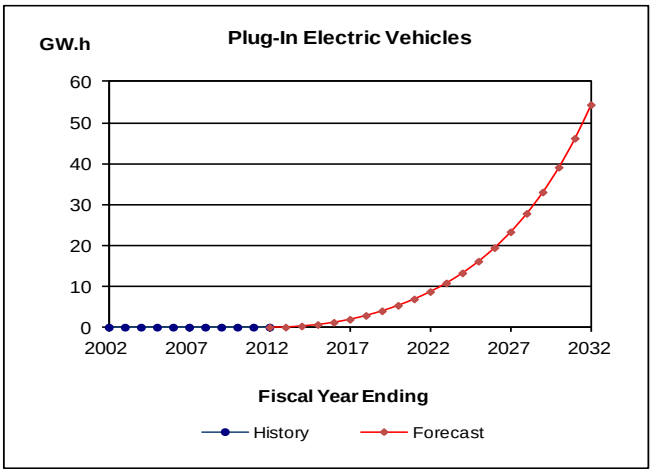
General Service Water Heating is a flat rate unmetered service that has not been available since November 12, 1969. There were 421 remaining services in 2011/12. The number of services is expected to decrease 5% per year throughout the forecast period. Consumption was 8 GW.h in 2011/12 and that is forecast to decrease to 3 GW.h by 2031/32.

General Service Surplus Energy Program

Participants in the Surplus Energy Program (SEP) used 25 GW.h in 2011/12 and are expected to consume 27 GW.h per year throughout the forecast period. This energy is considered to be “interruptible” and thus “non-firm”. The energy used by these customers is included in Sales. But it is excluded from the Gross Firm Energy forecasts.

Plug-In Electric Vehicles

Figure 9 - Plug-In Electric Vehicles



This forecast includes an estimate of the future adoption of Plug-In Electric Vehicles (PEVs). This is made up of two types:
(1) Plug-In Hybrid Electric Vehicles (PHEVs) that run on an electric battery but use an internal combustion engine (ICE) when the electricity runs low. An example is the Chevrolet Volt.
(2) Battery Electric Vehicles (BEVs) that run only on electric battery power, such as the Nissan Leaf.

The forecast of PEVs does not include Hybrid Electric Vehicles (HEVs). These vehicles, such as the Toyota Prius, have an internal combustion engine as well as a battery and electric motor to drive the wheels. The HEV battery is charged with power from the ICE and through regenerative breaking. It is not charged by plugging in and therefore does not affect electricity consumption in Manitoba. As of March 1, 2012, there were 3,141 HEVs registered in Manitoba, making up about 0.4% of all registered vehicles.

There are many challenges that need to be overcome before PEVs start to become a significant player in the automotive industry. They will be in direct competition with existing ICEs and HEVs that continue to improve fuel economy.

Large auto makers have only just started producing a limited number of PEVs. Their introduction will be gradual, and their adoption will take time. The consumer has to pay a premium price for the technology. The Chevrolet Volt 2012 manufacturer suggested retail price starts at $41,545 CAD and the Nissan Leaf 2012 starts at $38,395. The price for a conventional ICE vehicle, e.g. the Chevy Cruze 2012, starts at $15,655 CAD. The high purchase price is currently a disincentive. Even with their lower fuel cost, total cost of ownership is not expected to be lower than conventional vehicles. It will take technological improvements and mass production to reduce the PEV production cost down to that of conventional vehicles.

Government may have to establish policies and programs specifically targeted to encourage purchases of PEVs. Additionally, governments will also have to determine where they will recover the lost gasoline taxes. If the price of gasoline at the pumps rises significantly relative to electricity, more people will consider electric vehicles.

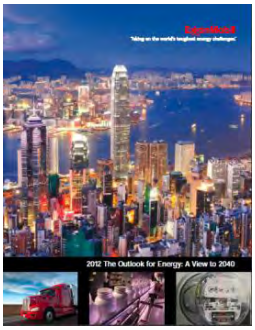
Technological improvements are needed before mass adoption is possible. The batteries today are expensive, large and take a long time to charge: 6 to 12 hours at 120 volts, and 4 hours at 240 volts. In Manitoba, 120 volt outlets are commonplace. Installing a 240 volt outlet would cost about $2000. Wireless charging mats would simplify home charging and eliminate the need to manually plug and unplug your vehicle, but would charge at a slower rate than 120 volt outlets.

Other concerns about BEV's include range anxiety, especially in Manitoba winters when their range may be reduced by up to 30% because battery power is required to keep the cabin heated and the windows defrosted.

Recent PEV Reports:

"Conventional cars using improved internal combustion engines have lower total costs of ownership (TCO) than electric or hydrogen powertrains throughout the modelled period to 2030. " - "Low carbon cars are likely to require continuing financial support, in the form of differential taxation (e.g. through company car tax or Vehicle Excise Duty) if they are to be widely adopted in future." - "Battery costs are required to drop below £68/kWh for EVs with a 240km range to be comparable to the ICE vehicle on a TCO basis in 2025. This is considerably lower than what most experts believe is likely or possible with current technology."

Influences on the Low Carbon Car Market from 2020 - 2030
July 2011, ElementEnergy for Low Carbon Vehicle Partnership
http://www.element-energy.co.uk/2011/09/element-energy-report-on-low-carbon-cars-published-by-the-low-carbon-vehicle-partnership/



"ExxonMobil expects that by 2040, hybrids and other advanced vehicles will account for nearly 50 percent of light duty vehicles on the road, compared to only about 1 percent today. The vast majority will be hybrids that use mainly gasoline plus a small amount of battery power; these will make up more than 40 percent of the global fleet by 2040. Globally, ExxonMobil expects to see growth in plug-in hybrids and electric vehicles, along with compressed natural gas (CNG) and liquefied petroleum gas (LPG) powered vehicles. However, these will account for only about 5 percent of the global fleet in 2040, their growth limited by cost and functionality considerations."

The Outlook for Energy: A View to 2040
2012 – ExxonMobil
http://www.exxonmobil.com/Corporate/energy_outlook.aspx

The Electric Vehicle Forecast

As of March 1st, 2012, there were five plug-in electric vehicles registered in Manitoba. Over the next few years, they are not expected to be widely available for purchase in Manitoba. The number of new PEVs is expected to slowly increase until it reaches about 1.2% of vehicle sales (624 per year) in 2021/22 and 4.7% of sales (3,510 per year) in 2031/32. The total number of electric vehicles on the road is expected to be 2,903 (0.3%) in 2021/22 and 18,150 (1.8%) in 2031/32.

The EPA rating for the pure electric 2012 Nissan Leaf is 3,400 kW.h for 16,000 km. Other electric vehicles, including the plug-in hybrid Chevrolet Volt, have similar EPA ratings. Actual usage depends on the distance driven. For this forecast, the average PEV is assumed to use 3,000 kW.h/year, which is almost as much as the annual energy use of an electric water heater. There are different opinions on average peak contribution per vehicle, but an acceptable expectation is that peak load use will approximately be equal to non-peak use. A load factor of 91% was chosen to derive the load coincident to Manitoba Hydro's system peak on a cold winter day.

The following table provides the estimate of the number of new vehicles and total vehicles each year in Manitoba, as well as the corresponding numbers for Plug-In Electric Vehicles. The PEV MW is at Hydro's system peak.

Forecast energy usage for PEVs in Manitoba is expected to be 9 GW.h in 2021/22 and 54 GW.h in 2031/32. Forecast peak usage at system peak is expected to be 1 MW in 2021/22 and 7 MW in 2031/32.

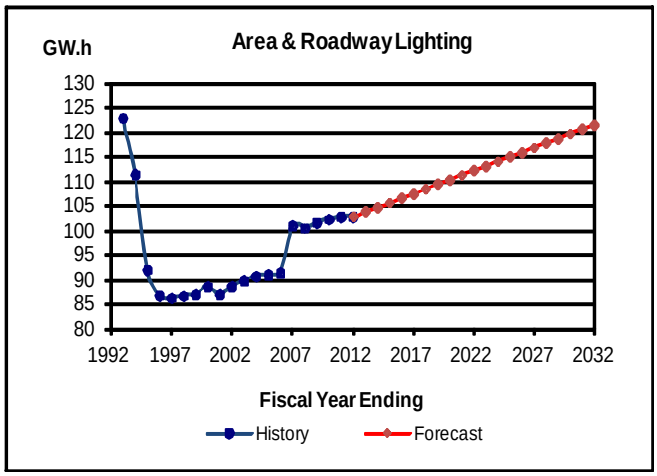
Table 17 - Plug-In Electric Vehicles

PLUG-IN ELECTRIC VEHICLE FORECAST
History and Forecast
2001/02 - 2031/32

Fiscal Year	New Vehicles Purchased	New PEV Purchased	New PEV %	Total Vehicles	Total PEV	Total % PEV	Cumul Total PEV GW.h	Cumul Total PEV MW
2001/02	44040	-	0.0%	624589	-	0.0%	0	0
2002/03	47770	-	0.0%	634842	-	0.0%	0	0
2003/04	44825	-	0.0%	646974	-	0.0%	0	0
2004/05	43412	-	0.0%	657828	-	0.0%	0	0
2005/06	44931	-	0.0%	665984	-	0.0%	0	0
2006/07	45924	-	0.0%	677999	-	0.0%	0	0
2007/08	47099	-	0.0%	696263	-	0.0%	0	0
2008/09	48029	-	0.0%	711504	-	0.0%	0	0
2009/10	43995	-	0.0%	723912	-	0.0%	0	0
2010/11	45355	1	0.0%	738435	1	0.0%	0	0
2011/12	46080	4	0.0%	756435	5	0.0%	0	0
2012/13	46648	29	0.1%	769361	34	0.0%	0	0
2013/14	47284	59	0.1%	782348	93	0.0%	0	0
2014/15	47928	120	0.3%	795399	213	0.0%	1	0
2015/16	48577	182	0.4%	808517	395	0.0%	1	0
2016/17	49232	246	0.5%	821706	641	0.1%	2	0
2017/18	49890	312	0.6%	834964	953	0.1%	3	0
2018/19	50550	379	0.8%	848293	1332	0.2%	4	0
2019/20	51212	448	0.9%	861689	1780	0.2%	5	1
2020/21	51874	529	1.0%	875149	2299	0.3%	7	1
2021/22	52534	624	1.2%	888670	2903	0.3%	9	1
2022/23	53192	733	1.3%	902246	3607	0.4%	11	1
2023/24	53846	869	1.5%	915870	4426	0.5%	13	2
2024/25	54495	1043	1.7%	929536	5379	0.6%	16	2
2025/26	55139	1239	2.0%	943237	6488	0.7%	19	2
2026/27	55778	1480	2.3%	956967	7778	0.8%	23	3
2027/28	56412	1771	2.7%	970718	9279	1.0%	28	3
2028/29	57040	2115	3.1%	984484	11024	1.1%	33	4
2029/30	57663	2529	3.5%	998259	13052	1.3%	39	5
2030/31	58280	3008	4.0%	1012037	15410	1.5%	46	6
2031/32	58894	3510	4.7%	1025815	18150	1.8%	54	7

Area & Roadway Lighting

Figure 10 - Area & Roadway Lighting



The Area and Roadway Lighting sector represents 0.5% of all sales within Manitoba. This sector includes electricity sales for the Sentinel Lighting and Street Lighting rate groups. Sentinel Lighting is an outdoor lighting service where units are available either as rentals to an existing metered service or on an unmetered, flat rate basis. Street Lighting includes all roadway lighting in Manitoba. Energy-efficient street lighting initiatives caused the significant drop in usage in the mid 1990's. In 2006, a readjustment of the rate classes moved some flat rate General Service meters into the Lighting sector. Only Street Lights count as customers.

The Area and Roadway Lighting sector is forecast to increase from 103 GW.h in 2011/12 to 122 GW.h by 2031/32 at an average growth rate of 1 GW.h or 0.8% per year.

Table 18 - Area & Roadway Lighting

AREA & ROADWAY LIGHTING (GW.h) HISTORICAL/WEATHER ADJUSTMENT/FORECAST					
Fiscal Year	Sales	Weather Adjust	Adjusted Sales	Fiscal Year	Forecast Sales
1992/93	123	0	123	2012/13	104
1993/94	111	0	111	2013/14	105
1994/95	92	0	92	2014/15	106
1995/96	87	0	87	2015/16	107
1996/97	86	0	86	2016/17	108
1997/98	87	0	87	2017/18	108
1998/99	87	0	87	2018/19	109
1999/00	89	0	89	2019/20	110
2000/01	87	0	87	2020/21	111
2001/02	89	0	89	2021/22	112
2002/03	90	0	90	2022/23	113
2003/04	91	0	91	2023/24	114
2004/05	91	0	91	2024/25	115
2005/06	91	0	91	2025/26	116
2006/07	101	0	101	2026/27	117
2007/08	101	0	101	2027/28	118
2008/09	102	0	102	2028/29	119
2009/10	102	0	102	2029/30	120
2010/11	103	0	103	2030/31	121
2011/12	103	0	103	2031/32	122

Table 19 - Area & Roadway Lighting

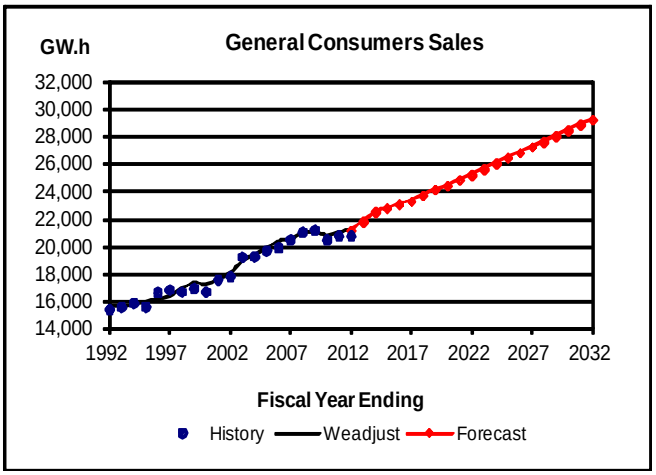
AREA AND ROADWAY LIGHTING
History and Forecast
2001/02 - 2031/32

Fiscal	Sentinal Flat Rates		Sentinal Rentals		Street Lighting		Total Lighting	
Year	(Services)	(GW.h)	(Services)	(GW.h)	(Custs)	(GW.h)	(Custs)	(GW.h)
2001/02	19166	10	5468	0	756	79	756	89
2002/03	19446	10	5477	0	755	80	755	90
2003/04	19527	10	5505	0	757	81	757	91
2004/05	19648	10	5519	0	759	81	759	91
2005/06	19652	10	7826	0	793	81	793	91
2006/07	18669	11	23994	0	1129	90	1129	101
2007/08	18947	11	24272	0	1142	90	1142	101
2008/09	19228	11	24542	0	1175	91	1175	102
2009/10	19539	11	24886	0	1191	91	1191	102
2010/11	19835	11	25216	0	1184	92	1184	103
2011/12	20033	11	25427	0	1155	91	1155	103
2012/13	20283	12	25684	0	1172	92	1172	104
2013/14	20551	12	25974	0	1182	93	1182	105
2014/15	20819	12	26264	0	1192	94	1192	106
2015/16	21087	12	26554	0	1202	95	1202	107
2016/17	21355	12	26844	0	1212	95	1212	108
2017/18	21623	12	27134	0	1222	96	1222	108
2018/19	21891	12	27424	0	1232	97	1232	109
2019/20	22159	13	27714	0	1242	98	1242	110
2020/21	22427	13	28004	0	1252	99	1252	111
2021/22	22695	13	28294	0	1262	99	1262	112
2022/23	22963	13	28584	0	1272	100	1272	113
2023/24	23231	13	28874	0	1282	101	1282	114
2024/25	23499	13	29164	0	1292	102	1292	115
2025/26	23767	14	29454	0	1302	102	1302	116
2026/27	24035	14	29744	0	1312	103	1312	117
2027/28	24303	14	30034	0	1322	104	1322	118
2028/29	24571	14	30324	0	1332	105	1332	119
2029/30	24839	14	30614	0	1342	106	1342	120
2030/31	25107	14	30904	0	1352	106	1352	121
2031/32	25375	14	31194	0	1362	107	1362	122

Total General Consumers Sales

Figure 11 - General Consumers Sales

General Consumers Sales includes sales to all of Manitoba Hydro's individually billed customers, but excludes export sales. This includes the total of all sales from the Residential, General Service and Lighting sectors. The General Service sector makes up about two-thirds, the Residential sector makes up about one-third and the Lighting group is only 0.5% of all sales.



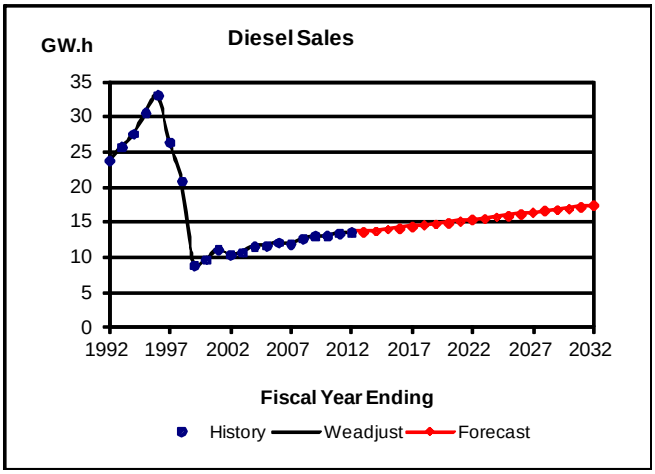
Weather adjusted General Consumers Sales has grown from 15,529 GW.h in 1992/93 to 21,177 GW.h in 2011/12 at an average growth of 282 GW.h or 1.6% per year. It is forecast to grow to 29,266 GW.h by 2031/32 at an average growth of 404 GW.h or 1.6% per year.

Table 20 - General Consumers Sales

GENERAL CONSUMERS SALES (GW.h) HISTORICAL/WEATHER ADJUSTMENT/FORECAST					
Fiscal Year	Sales	Weather Adjust	Adjusted Sales	Fiscal Year	Forecast Sales
1992/93	15577	-48	15529	2012/13	21797
1993/94	15870	-206	15664	2013/14	22465
1994/95	15600	219	15819	2014/15	22755
1995/96	16654	-568	16086	2015/16	23050
1996/97	16851	-588	16263	2016/17	23316
1997/98	16681	155	16836	2017/18	23721
1998/99	16929	312	17241	2018/19	24159
1999/00	16696	498	17193	2019/20	24425
2000/01	17590	-32	17558	2020/21	24848
2001/02	17805	183	17987	2021/22	25251
2002/03	19246	-402	18844	2022/23	25659
2003/04	19280	-16	19264	2023/24	26060
2004/05	19735	50	19786	2024/25	26465
2005/06	19935	369	20304	2025/26	26862
2006/07	20510	-58	20451	2026/27	27256
2007/08	21061	-130	20932	2027/28	27656
2008/09	21210	-204	21006	2028/29	28059
2009/10	20486	246	20733	2029/30	28462
2010/11	20786	142	20928	2030/31	28863
2011/12	20771	407	21177	2031/32	29266

Diesel Sales

Figure 12 - Diesel Sales



There are four diesel sites in Manitoba: Brochet, Lac Brochet, Tadoule Lake and Shamattawa. Diesel sales are included in General Consumers Sales, but are not part of the integrated system.

Between 1997 and 1999, eleven diesel communities were connected to the integrated system. Between 1991 and 2001, the four sites that were to remain diesel were converted from 15 amp service to 60 amp service causing the increase in those years.

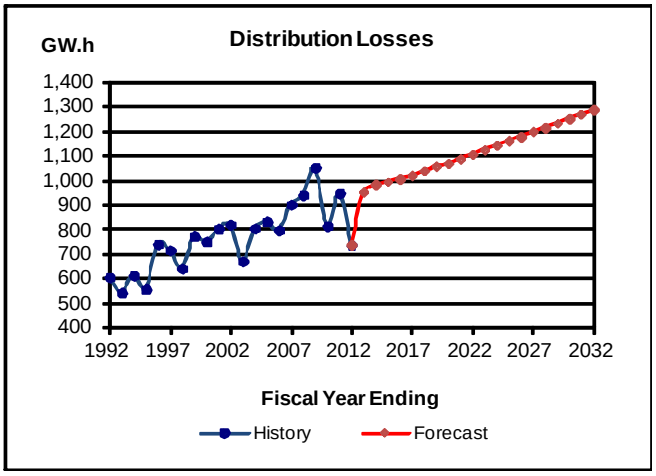
Diesel sales are subtracted from Total General Consumers Sales when comparing sales to generation. Diesel customers do not have electric heat, which requires 200 amp service, therefore there is no weather effect.

Table 21 - Diesel Sales

DIESEL SALES (GW.h) HISTORICAL/WEATHER ADJUSTMENT/FORECAST					
Fiscal Year	Sales	Weather Adjust	Adjusted Sales	Fiscal Year	Forecast Sales
1992/93	26	0	26	2012/13	14
1993/94	28	0	28	2013/14	14
1994/95	31	0	31	2014/15	14
1995/96	33	0	33	2015/16	14
1996/97	26	0	26	2016/17	14
1997/98	21	0	21	2017/18	15
1998/99	9	0	9	2018/19	15
1999/00	10	0	10	2019/20	15
2000/01	11	0	11	2020/21	15
2001/02	10	0	10	2021/22	15
2002/03	11	0	11	2022/23	16
2003/04	12	0	12	2023/24	16
2004/05	12	0	12	2024/25	16
2005/06	12	0	12	2025/26	16
2006/07	12	0	12	2026/27	16
2007/08	13	0	13	2027/28	17
2008/09	13	0	13	2028/29	17
2009/10	13	0	13	2029/30	17
2010/11	13	0	13	2030/31	17
2011/12	14	0	14	2031/32	17

Distribution Losses

Figure 13 - Distribution Losses



Distribution Losses are made up of the power loss between the distribution substation (Manitoba Load at Common Bus less Construction) and the customer's meter (General Consumers Sales less Diesel), as well as all other differences between what was billed and what was metered. The other differences include:

1. The offset between cycle billing (General Consumers Sales) and actual calendar month usage (Common Bus).
2. Customer Accounting adjustments,
3. Inaccuracies associated with estimated billing (including flat rate estimates),
4. The metered but unbilled consumption of Manitoba Hydro offices, and
5. Energy lost due to theft.

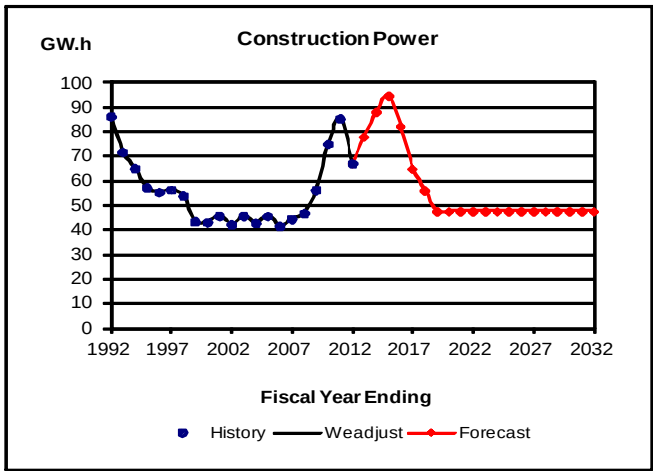
Distribution Losses are forecast in 2012/13 to be about 4.4% of the General Consumers Sales less Diesel and remain at about that level throughout the forecast.

Table 22 - Distribution Losses

DISTRIBUTION LOSSES (GW.h) HISTORICAL/PERCENT OF SALES/FORECAST							
Fiscal Year	Losses	Sales - Diesel	% Losses	Fiscal Year	Forecast Losses	Sales - Diesel	% Losses
1992/93	541	15551	3.5%	2012/13	950	21784	4.4%
1993/94	614	15843	3.9%	2013/14	980	22451	4.4%
1994/95	556	15569	3.6%	2014/15	993	22741	4.4%
1995/96	740	16621	4.4%	2015/16	1007	23036	4.4%
1996/97	715	16825	4.3%	2016/17	1019	23302	4.4%
1997/98	641	16660	3.8%	2017/18	1037	23706	4.4%
1998/99	771	16920	4.6%	2018/19	1056	24144	4.4%
1999/00	749	16686	4.5%	2019/20	1068	24410	4.4%
2000/01	802	17579	4.6%	2020/21	1087	24833	4.4%
2001/02	819	17794	4.6%	2021/22	1105	25236	4.4%
2002/03	671	19236	3.5%	2022/23	1124	25643	4.4%
2003/04	804	19269	4.2%	2023/24	1142	26044	4.4%
2004/05	830	19724	4.2%	2024/25	1160	26449	4.4%
2005/06	797	19923	4.0%	2025/26	1178	26846	4.4%
2006/07	900	20498	4.4%	2026/27	1195	27239	4.4%
2007/08	940	21049	4.5%	2027/28	1213	27639	4.4%
2008/09	1052	21197	5.0%	2028/29	1231	28042	4.4%
2009/10	813	20473	4.0%	2029/30	1249	28445	4.4%
2010/11	947	20773	4.6%	2030/31	1268	28846	4.4%
2011/12	736	20757	3.5%	2031/32	1286	29248	4.4%

Construction Power

Figure 14 - Construction Power



Construction Power represents the energy used by Manitoba Hydro and its contractors in the construction of major capital works such as generating stations, converter stations and major transmission lines. Construction Power also includes Station Service until a plant is commissioned, as well as 48 GW.h of heating load at the Gillam, Limestone and Kettle town sites. Construction usage dropped after the Limestone Generating Station was completed in the 90's.

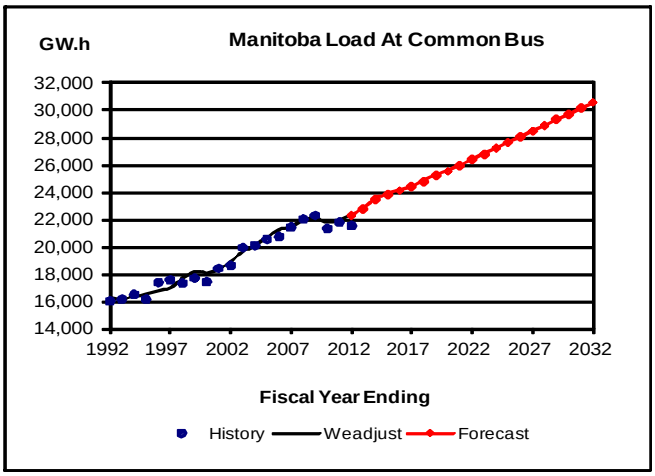
The Construction Power forecast includes: (1) the Wuskwatim generating station that is now underway with an in-service date during 2012/13 and final construction expected to be completed in 2014/15, (2) the Pointe Du Bois spillway replacement that will take place from July 2012 to July 2016 requiring 5 MV.A at 50% utilization, and (3) the Keewatinoow Converter Station retrofit from October 2012 to December 2017. Construction Power does not include construction power estimates for any non-committed sites (e.g. Conawapa and Keeyask).

Table 23 - Construction Power

CONSTRUCTION POWER (GW.h) HISTORICAL/WEATHER ADJUSTMENT/FORECAST					
Fiscal Year	Usage	Weather Adjust	Adjusted Usage	Fiscal Year	Forecast Usage
1992/93	72	0	72	2012/13	78
1993/94	65	0	65	2013/14	88
1994/95	57	0	57	2014/15	95
1995/96	55	0	55	2015/16	82
1996/97	56	0	56	2016/17	65
1997/98	54	0	54	2017/18	56
1998/99	43	0	43	2018/19	47
1999/00	43	0	43	2019/20	47
2000/01	46	0	46	2020/21	47
2001/02	42	0	42	2021/22	47
2002/03	46	0	46	2022/23	47
2003/04	43	0	43	2023/24	47
2004/05	46	0	46	2024/25	47
2005/06	42	0	42	2025/26	47
2006/07	45	0	45	2026/27	47
2007/08	47	0	47	2027/28	47
2008/09	56	0	56	2028/29	47
2009/10	75	0	75	2029/30	47
2010/11	85	0	85	2030/31	47
2011/12	67	0	67	2031/32	47

Manitoba Load at Common Bus

Figure 15 - Manitoba Load at Common Bus



Manitoba Load at Common Bus is the total load measured from all the distribution points (i.e. substations) within Manitoba. It includes all energy supplied to General Consumers Sales customers, Construction Power plus associated Distribution Losses, but excludes Diesel customers, Transmission Losses and Station Service.

Common Bus is metered and totaled to correspond exactly to each calendar month. Weather adjustment is done on a calendar month basis.

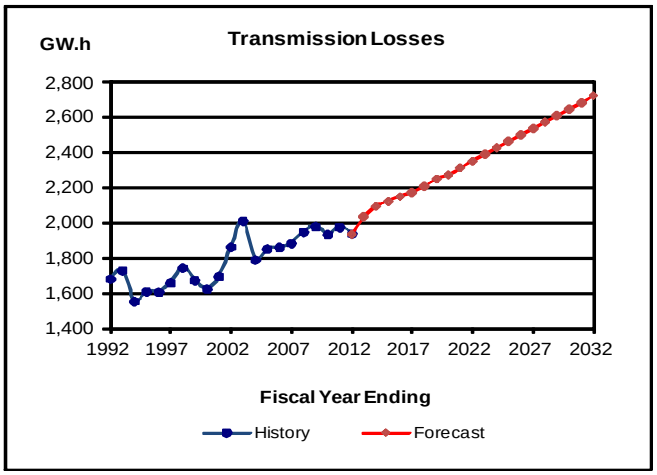
Weather adjusted Common Bus has grown from 16,072 GW.h in 1992/93 to 22,271 GW.h in 2011/12 at an average growth of 310 GW.h or 1.7% per year. It is forecast to grow to 30,581 GW.h by 2031/32 at an average growth of 416 GW.h or 1.6% per year.

Table 24 - Manitoba Load at Common Bus

MANITOBA LOAD AT COMMON BUS (GW.h) HISTORICAL/WEATHER ADJUSTMENT/FORECAST					
Fiscal Year	Energy	Weather Adjust	Adjusted Energy	Fiscal Year	Forecast Energy
1992/93	16166	-93	16072	2012/13	22812
1993/94	16523	-197	16326	2013/14	23520
1994/95	16185	301	16486	2014/15	23829
1995/96	17418	-729	16689	2015/16	24125
1996/97	17590	-644	16946	2016/17	24385
1997/98	17350	260	17610	2017/18	24799
1998/99	17722	383	18105	2018/19	25248
1999/00	17479	571	18050	2019/20	25526
2000/01	18428	-157	18271	2020/21	25968
2001/02	18655	184	18839	2021/22	26389
2002/03	19953	-366	19586	2022/23	26814
2003/04	20116	-90	20026	2023/24	27234
2004/05	20600	10	20610	2024/25	27656
2005/06	20761	440	21201	2025/26	28071
2006/07	21442	-19	21423	2026/27	28482
2007/08	22036	-208	21828	2027/28	28900
2008/09	22305	-234	22071	2028/29	29321
2009/10	21361	351	21712	2029/30	29742
2010/11	21806	66	21871	2030/31	30161
2011/12	21560	711	22271	2031/32	30581

Transmission Losses

Figure 16 - Transmission Losses



Transmission Losses are the amount of energy lost while delivering power from the generation stations to all of the distribution substations that make up Common Bus. Transmission Losses only contains losses associated with supplying Manitoba customers. Losses attributable to exports and the gains attributable to imports are excluded. Transmission Losses are substantial because most of the northern generation is transmitted to southern distribution points 900 kilometers away. Transmission Losses vary significantly depending on water conditions, system configuration, outages and the magnitude of the load. Losses were up significantly in 2002/03 due to two High Voltage Direct Current (HVDC) transformer failures.

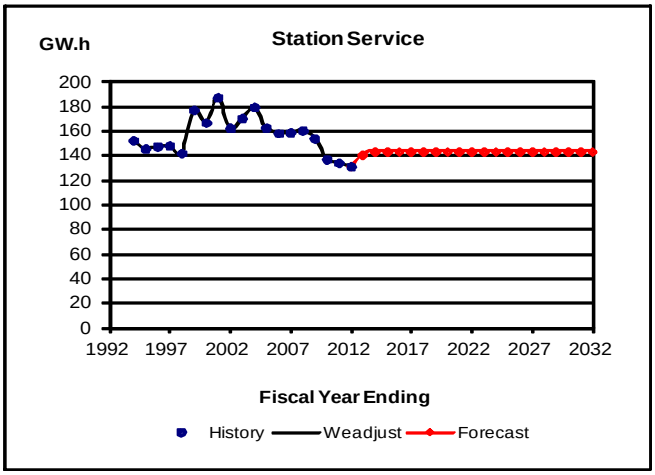
Transmission Losses are forecast to be about 9.3% of the Manitoba Load at Common Bus.

Table 25 - Transmission Losses

TRANSMISSION LOSSES (GW.h) HISTORICAL/PERCENT OF COMMON BUS/FORECAST							
Fiscal Year	Losses	Sales less Diesel	% Losses	Fiscal Year	Forecast Losses	Sales less Diesel	% Losses
1992/93	1728	15551	11.1%	2012/13	2034	21784	9.3%
1993/94	1552	15843	9.8%	2013/14	2097	22451	9.3%
1994/95	1609	15569	10.3%	2014/15	2125	22741	9.3%
1995/96	1606	16621	9.7%	2015/16	2151	23036	9.3%
1996/97	1660	16825	9.9%	2016/17	2174	23302	9.3%
1997/98	1745	16660	10.5%	2017/18	2211	23706	9.3%
1998/99	1675	16920	9.9%	2018/19	2251	24144	9.3%
1999/00	1623	16686	9.7%	2019/20	2276	24410	9.3%
2000/01	1696	17579	9.6%	2020/21	2315	24833	9.3%
2001/02	1864	17794	10.5%	2021/22	2353	25236	9.3%
2002/03	2012	19236	10.5%	2022/23	2391	25643	9.3%
2003/04	1792	19269	9.3%	2023/24	2428	26044	9.3%
2004/05	1852	19724	9.4%	2024/25	2466	26449	9.3%
2005/06	1860	19923	9.3%	2025/26	2503	26846	9.3%
2006/07	1885	20498	9.2%	2026/27	2539	27239	9.3%
2007/08	1949	21049	9.3%	2027/28	2577	27639	9.3%
2008/09	1979	21197	9.3%	2028/29	2614	28042	9.3%
2009/10	1934	20473	9.4%	2029/30	2652	28445	9.3%
2010/11	1977	20773	9.5%	2030/31	2689	28846	9.3%
2011/12	1939	20757	9.3%	2031/32	2727	29248	9.3%

Station Service

Figure 17 - Station Service



Station Service is the energy used by power plants to generate power and service their own load. Energy and peak estimates can either include or exclude Station Service, depending on the purpose for which they are to be used. Station Service energy was not measured prior to 1993/94 but was then included in Transmission Losses.

Station Service energy is forecast to be 141 GW.h in 2012/13 and 144 GW.h from 2013/14 and on, when the Wuskwatim generating station has its full contribution. Station Service for non-committed sites (e.g. Conawapa and Keeyask) is not included in the forecast.

Table 26 - Station Service

STATION SERVICE (GW.h) HISTORICAL/WEATHER ADJUSTMENT/FORECAST					
Fiscal Year	Usage	Weather Adjust	Adjusted Usage	Fiscal Year	Forecast Usage
1992/93	0	0	0	2012/13	141
1993/94	152	0	152	2013/14	144
1994/95	146	0	146	2014/15	144
1995/96	148	0	148	2015/16	144
1996/97	148	0	148	2016/17	144
1997/98	142	0	142	2017/18	144
1998/99	177	0	177	2018/19	144
1999/00	167	0	167	2019/20	144
2000/01	187	0	187	2020/21	144
2001/02	162	0	162	2021/22	144
2002/03	170	0	170	2022/23	144
2003/04	179	0	179	2023/24	144
2004/05	163	0	163	2024/25	144
2005/06	158	0	158	2025/26	144
2006/07	159	0	159	2026/27	144
2007/08	161	0	161	2027/28	144
2008/09	154	0	154	2028/29	144
2009/10	137	0	137	2029/30	144
2010/11	134	0	134	2030/31	144
2011/12	131	0	131	2031/32	144

Table 27 - Monthly Station Service Energy

MONTHLY STATION SERVICE ENERGY (GW.h)
History and Forecast

Fiscal Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
2001/02	14.8	10.3	7.5	9.5	10.4	7.6	11.9	13.5	19.4	21.1	18.7	17.6	162.3
2002/03	15.5	13.9	9.4	13.8	8.6	8.2	11.3	14.0	17.6	19.9	18.6	19.4	170.3
2003/04	16.0	11.6	9.7	11.7	12.5	12.7	13.3	17.7	18.6	23.2	16.8	15.6	179.4
2004/05	11.8	10.4	8.1	8.1	8.0	9.6	12.0	15.9	21.2	21.6	17.9	18.0	162.7
2005/06	12.6	11.0	10.0	11.1	10.1	9.6	11.8	15.2	18.4	16.7	17.0	14.9	158.3
2006/07	10.2	8.9	8.4	10.3	9.3	8.6	13.4	16.1	16.7	18.6	19.7	18.7	158.8
2007/08	15.7	12.1	9.1	8.2	8.4	7.3	8.7	14.7	19.2	18.6	19.7	18.8	160.5
2008/09	13.8	9.4	7.5	9.5	10.4	7.1	10.6	15.1	20.1	20.4	14.9	15.5	154.2
2009/10	11.8	10.3	7.9	7.2	7.4	7.2	10.8	14.2	18.8	15.5	13.3	12.7	137.1
2010/11	10.2	9.9	7.3	6.7	7.2	7.4	9.5	12.9	16.4	17.1	14.4	15.0	134.1
2011/12	12.0	9.9	7.5	7.1	7.3	6.7	9.5	13.1	15.1	16.0	13.8	13.1	131.3
2012/13	11.6	9.9	7.3	7.6	7.7	7.1	10.3	14.8	17.5	17.4	14.6	15.3	141.1
2013/14 - 2031/32	12.0	10.3	7.6	7.9	8.0	7.4	10.7	14.8	17.5	17.4	14.6	15.3	143.5

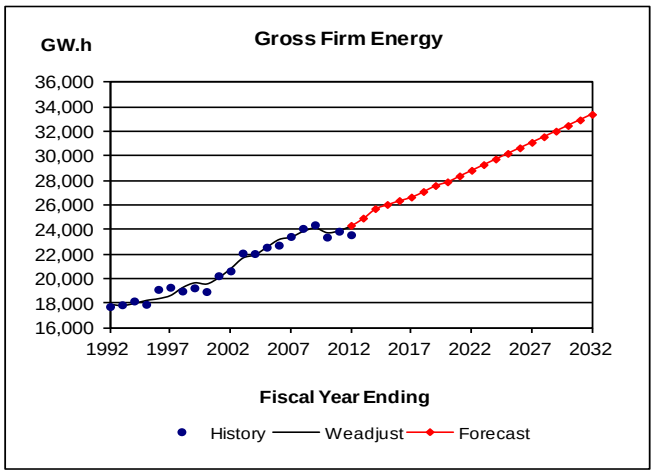
Table 28 - Monthly Station Service Peak

MONTHLY STATION SERVICE PEAK (MW)
History and Forecast

Fiscal Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Annual
2011/12 Actual	19	14	8	14	9	9	20	22	22	25	22	20	25
2012/13	20	15	10	12	9	10	18	25	28	26	24	24	26
2013/14 - 2031/32	21	16	10	12	9	10	19	25	28	26	24	24	26

Gross Firm Energy

Figure 18 - Gross Firm Energy



Gross Firm Energy is the energy required to serve Manitoba Hydro's customers on the Integrated System. It excludes exports, interruptible (non-firm) loads, Diesel customers and Station Service for committed plants.

Gross Firm Energy has grown steadily during the past twenty years, except for the economic slowdown in the early 1990's and more recently in 2009.

Weather adjusted Gross Firm Energy has grown from 17,797 GW.h in 1992/93 to 24,368 GW.h in 2011/12 at an average growth of 329 GW.h or 1.7% per year. It is forecast to grow to 33,425 GW.h by 2031/32 at an average growth of 453 GW.h or 1.6% per year.

Table 29 - Gross Firm Energy

GROSS FIRM ENERGY (GW.h) HISTORICAL/WEATHER ADJUSTMENT/FORECAST					
Fiscal Year	Energy	Weather Adjust	Adjusted Energy	Fiscal Year	Forecast Energy
1992/93	17894	-97	17797	2012/13	24961
1993/94	18201	-222	17979	2013/14	25734
1994/95	17929	296	18226	2014/15	26071
1995/96	19148	-779	18369	2015/16	26393
1996/97	19321	-686	18634	2016/17	26677
1997/98	19014	274	19288	2017/18	27128
1998/99	19273	399	19672	2018/19	27616
1999/00	18971	606	19576	2019/20	27919
2000/01	20262	-160	20102	2020/21	28400
2001/02	20656	199	20855	2021/22	28859
2002/03	22110	-395	21715	2022/23	29322
2003/04	22069	-97	21973	2023/24	29779
2004/05	22589	27	22616	2024/25	30239
2005/06	22757	483	23240	2025/26	30691
2006/07	23464	-29	23435	2026/27	31138
2007/08	24122	-217	23905	2027/28	31594
2008/09	24417	-237	24180	2028/29	32053
2009/10	23412	377	23789	2029/30	32511
2010/11	23892	72	23964	2030/31	32967
2011/12	23605	763	24367	2031/32	33425

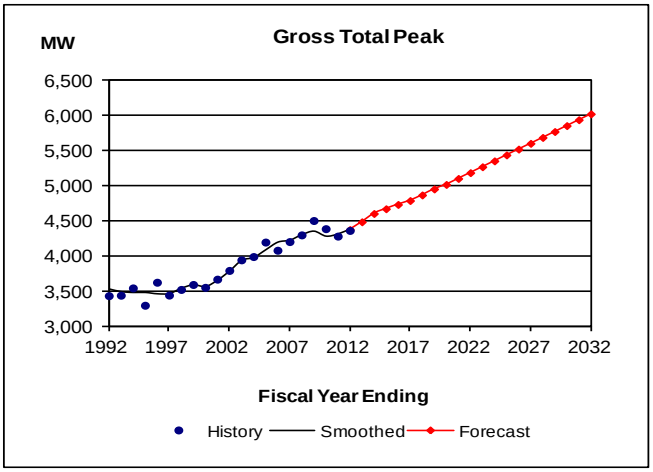
Table 30 - Monthly Gross Firm Energy

MONTHLY GROSS FIRM ENERGY (GW.h)
History and Forecast
2001/02 - 2031/32

Fiscal Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
2001/02	1588	1496	1439	1508	1577	1426	1639	1742	2079	2185	1864	2112	20656
2002/03	1727	1629	1538	1617	1554	1535	1811	1964	2149	2341	2142	2104	22110
2003/04	1657	1579	1520	1573	1685	1548	1688	2024	2198	2479	2088	2029	22069
2004/05	1699	1683	1545	1579	1575	1574	1793	1952	2411	2539	2098	2140	22589
2005/06	1727	1698	1660	1735	1649	1610	1781	2045	2301	2240	2171	2139	22757
2006/07	1712	1690	1681	1826	1746	1622	1870	2092	2303	2458	2304	2159	23464
2007/08	1842	1701	1663	1820	1727	1650	1836	2108	2490	2584	2427	2273	24122
2008/09	1881	1737	1662	1730	1787	1681	1874	2154	2652	2702	2226	2331	24417
2009/10	1861	1744	1671	1667	1644	1672	1888	1935	2560	2524	2213	2032	23412
2010/11	1699	1692	1611	1716	1698	1638	1778	2129	2563	2682	2322	2364	23892
2011/12	1862	1751	1603	1789	1741	1643	1814	2125	2435	2526	2251	2064	23605
11/12 Wadj	1868	1779	1626	1707	1703	1634	1872	2196	2598	2714	2343	2327	24367
10 Year Hist	28	28	19	20	13	21	23	45	52	53	48	22	371
Avg Growth	1.6%	1.7%	1.2%	1.2%	0.8%	1.4%	1.3%	2.3%	2.3%	2.2%	2.3%	1.0%	1.7%
2012/13	1869	1796	1729	1802	1762	1705	1999	2279	2594	2661	2348	2416	24961
2013/14	1929	1855	1786	1860	1818	1762	2063	2348	2670	2738	2416	2489	25734
2014/15	1953	1878	1808	1883	1841	1784	2089	2380	2707	2775	2449	2523	26071
2015/16	1977	1901	1830	1906	1863	1805	2115	2409	2741	2811	2481	2554	26393
2016/17	1997	1920	1849	1926	1883	1823	2137	2436	2772	2842	2508	2582	26677
2017/18	2031	1952	1880	1959	1915	1855	2174	2477	2818	2890	2550	2626	27128
2018/19	2068	1988	1914	1994	1949	1888	2213	2522	2869	2942	2596	2673	27616
2019/20	2090	2008	1933	2014	1969	1907	2237	2550	2903	2977	2627	2704	27919
2020/21	2126	2043	1966	2048	2003	1940	2276	2594	2953	3028	2672	2751	28400
2021/22	2160	2076	1998	2081	2035	1972	2312	2636	3001	3077	2716	2795	28859
10 Year Fcst	29	30	37	37	33	34	44	44	40	36	37	47	449
Avg Growth	1.5%	1.6%	2.1%	2.0%	1.8%	1.9%	2.1%	1.8%	1.5%	1.3%	1.5%	1.9%	1.7%
2022/23	2195	2109	2030	2114	2067	2003	2350	2679	3050	3127	2760	2841	29322
2023/24	2228	2141	2061	2146	2098	2034	2386	2721	3098	3177	2803	2885	29779
2024/25	2263	2174	2092	2178	2130	2065	2423	2763	3146	3227	2847	2930	30239
2025/26	2296	2206	2122	2210	2162	2096	2459	2805	3194	3275	2890	2974	30691
2026/27	2330	2238	2153	2242	2192	2126	2495	2846	3241	3324	2933	3018	31138
2027/28	2364	2270	2184	2274	2224	2157	2532	2888	3289	3373	2976	3063	31594
2028/29	2398	2303	2215	2306	2256	2188	2569	2931	3337	3423	3020	3107	32053
2029/30	2432	2336	2246	2339	2287	2219	2605	2973	3386	3472	3064	3152	32511
2030/31	2466	2368	2277	2371	2319	2250	2642	3015	3434	3522	3107	3197	32967
2031/32	2500	2401	2308	2404	2351	2280	2679	3057	3482	3571	3151	3241	33425
20 Year Fcst	32	31	34	35	32	32	40	43	44	43	40	46	453
Avg Growth	1.5%	1.5%	1.8%	1.7%	1.6%	1.7%	1.8%	1.7%	1.5%	1.4%	1.5%	1.7%	1.6%

Gross Total Peak

Figure 19 - Gross Total Peak



Gross Total Peak is the maximum integrated (i.e. average) hourly load required to serve Manitoba Hydro's customers on the Integrated System. It excludes exports and Diesel customers. It includes station service and curtailable loads.

Typically, the peak occurs on a very cold winter weekday either in the morning (often from 8 a.m. to 9 a.m.) or in the afternoon, (from 5 p.m. to 6 p.m.) Electric heating contributes by placing the peak on one of the coldest days, whereas the operation or lack thereof of large industrials often makes the difference as to the specific day and peak hour.

Weather adjusted Gross Total Peak has grown from 3,491 MW in 1992/93 to 4,380 MW in 2011/12 at an average growth of 44 MW or 1.2% per year. It is forecast to grow to 6,032 MW at 83 MW (1.6%) per year by 2031/32.

Table 31 – Gross Total Peak

GROSS TOTAL PEAK (MW) HISTORICAL/WEATHER ADJUSTMENT/FORECAST					
Fiscal Year	Peak	Weather Adjust	Adjusted Peak	Fiscal Year	Forecast Peak
1992/93	3443	48	3491	2012/13	4491
1993/94	3547	-68	3479	2013/14	4609
1994/95	3299	180	3479	2014/15	4677
1995/96	3628	-167	3460	2015/16	4738
1996/97	3444	20	3465	2016/17	4794
1997/98	3525	15	3540	2017/18	4874
1998/99	3596	-9	3587	2018/19	4959
1999/00	3555	9	3564	2019/20	5024
2000/01	3672	-18	3654	2020/21	5109
2001/02	3797	-12	3784	2021/22	5192
2002/03	3948	-13	3934	2022/23	5276
2003/04	3994	-19	3976	2023/24	5360
2004/05	4201	-117	4084	2024/25	5445
2005/06	4085	107	4192	2025/26	5528
2006/07	4208	12	4220	2026/27	5611
2007/08	4304	-6	4298	2027/28	5695
2008/09	4509	-162	4347	2028/29	5779
2009/10	4393	-116	4276	2029/30	5863
2010/11	4286	22	4308	2030/31	5947
2011/12	4367	13	4380	2031/32	6032

Table 32 - Monthly Gross Total Peak

MONTHLY GROSS TOTAL PEAK (MW)
History and Forecast
2001/02 - 2031/32

Fiscal Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Annual
2001/02	2760	2500	2642	2723	2792	2618	2802	3244	3430	3797	3622	3466	3797
2002/03	3079	2820	2781	2911	2738	2691	3039	3397	3660	3848	3948	3813	3948
2003/04	3242	2587	2871	2877	2921	2901	2988	3467	3791	3994	3743	3465	3994
2004/05	2868	2773	2713	2893	2632	2748	2980	3598	4057	4201	3843	3577	4201
2005/06	2959	2845	3052	3116	3050	2837	2948	3672	3912	3630	4085	3498	4085
2006/07	3092	2821	3015	3141	3040	2954	3220	3789	4011	4208	4203	3847	4208
2007/08	3494	2736	3042	3294	3033	2777	2979	3996	4078	4304	4289	4095	4304
2008/09	3221	2893	2952	2920	3110	2726	3159	3804	4427	4509	4196	4223	4509
2009/10	3196	2933	3000	2758	2933	2982	3054	3297	4393	4256	4092	4235	4393
2010/11	2905	2843	2805	2991	3163	2709	3056	3927	4195	4286	4250	4169	4286
2011/12	3183	2886	3056	3278	3189	3045	3129	3756	4095	4367	4270	3608	4367
2012/13	3451	3143	3091	3200	3104	3063	3498	4012	4352	4441	4362	4098	4491
2013/14	3549	3235	3181	3290	3191	3153	3597	4123	4468	4559	4478	4210	4609
2014/15	3598	3280	3224	3335	3235	3196	3648	4181	4533	4626	4544	4271	4677
2015/16	3644	3321	3264	3377	3276	3236	3694	4235	4592	4686	4603	4326	4738
2016/17	3685	3358	3299	3414	3312	3271	3735	4283	4644	4740	4656	4376	4794
2017/18	3745	3413	3353	3469	3366	3326	3797	4354	4721	4818	4733	4448	4874
2018/19	3811	3473	3411	3528	3424	3385	3863	4431	4804	4903	4817	4527	4959
2019/20	3857	3514	3449	3568	3463	3423	3910	4486	4865	4966	4878	4584	5024
2020/21	3922	3574	3507	3627	3520	3482	3976	4562	4948	5051	4962	4662	5109
2021/22	3985	3632	3562	3683	3575	3538	4040	4636	5028	5132	5042	4738	5192
2022/23	4049	3690	3617	3740	3631	3595	4105	4711	5109	5215	5124	4814	5276
2023/24	4112	3748	3673	3798	3687	3652	4170	4786	5190	5298	5205	4891	5360
2024/25	4177	3806	3729	3856	3744	3709	4235	4861	5272	5382	5287	4968	5445
2025/26	4240	3863	3783	3913	3799	3765	4299	4935	5353	5464	5368	5043	5528
2026/27	4302	3920	3837	3969	3853	3820	4362	5008	5432	5546	5448	5118	5611
2027/28	4365	3977	3893	4026	3909	3876	4426	5082	5513	5629	5529	5194	5695
2028/29	4429	4035	3948	4084	3965	3933	4491	5157	5595	5712	5611	5271	5779
2029/30	4493	4093	4004	4142	4021	3990	4556	5232	5676	5795	5693	5347	5863
2030/31	4556	4151	4059	4200	4077	4046	4621	5306	5757	5878	5774	5424	5947
2031/32	4620	4209	4115	4258	4133	4103	4685	5381	5838	5961	5856	5500	6032

Peak load is measured and recorded differently than energy data. The system load at every hour is calculated by System Operations as:

Hourly Gross Total Peak (t)
= Hourly Total Generation (t)
- Hourly Metered Exports (t) + Hourly Metered Imports (t)
- Losses Associated with Exports (t) + Gains Associated with Imports (t)
+ Curtailments (t)

Losses for exports and gains for imports are only known on a monthly energy basis. The hourly value is obtained by using the ratio of exports/imports for the hour to the total exports/imports for the month and applying that to the total metered loss/gain for the month. The remaining difference between the balance of the load and Common Bus is taken as the Transmission Losses associated with Manitoba load.

Curtailments for individual customers are calculated as the difference between what the customer would have used if not curtailed versus what they did use. This is not the same as the calculation used for billing.

Annual Peak

The forecast annual peak is higher than the maximum of the monthly peaks. This is due to the peak being possible in any of the winter months and must be higher than the peak of the other months. For studies requiring yearly data, the annual peak should be used.

16 Hour Peak

The peaks in this document are integrated hourly peaks. For some studies and analysis of avoided cost or DSM savings, an estimate of the average peak during onpeak hours (from 6 a.m. to 10 p.m.) may be desired. To convert hourly peak to 16 hour peak, multiply the hourly peak in the associated month by the following percentages:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
94.4%	94.9%	95.8%	96.0%	96.3%	96.0%	96.6%	95.6%	95.8%	96.6%	95.6%	95.5%	94.8%

VARIABILITY AND ACCURACY

Weather Effect and Weather Adjustment

The weather effect is determined in any sector by regressing the last two years of actual monthly energies against the actual DDH and DDC for the month. This results in a GW.h per DDH effect and a GW.h per DDC effect for that sector.

Only sectors whose major variation is due to weather can have a weather effect estimated. Sectors that vary primarily due to industrial output levels or seasonal but non-weather reasons may yield false weather effects if estimated. Weather effects are not determined for the GS Top Consumers, Seasonal, Diesel, Water Heating and Lighting sectors. Assigning them a weather affect and weather adjusting them will not improve their forecast.

For sectors where a weather effect is calculated, this document will show energy as the reported value and as a weather adjusted value. Forecasts are based on the weather adjusted values. The calculation and weather affects are:

Weather Adjustment = DDH weather effect * (DDH actual - DDH normal)
+ DDC weather effect * (DDC actual - DDC normal)

Weather Adjusted Actual = Actual - Weather Adjustment

Following are the DDH and DDC weather effect factors by sector:

Residential: 0.6 GW.h / DDH, 1.4 GW.h / DDC
GS Mass Market: 0.3 GW.h / DDH, 1.2 GW.h / DDC
General Consumers Sales: 0.9 GW.h / DDH, 2.7 GW.h / DDC
System Energy: 1.1 GW.h / DDH, 3.0 GW.h / DDC
System Peak: 40 MW / degree (at -30 degrees Celsius),
120 MW / degree (at +30 degrees Celsius)

Effect of Extreme Weather

A record cold winter will increase load 4% and a record warm winter will decrease it 3%. An additional 2% load increase is possible due to a record hot summer and a 1% decrease due to a record cool summer.

The effect of extreme weather is larger on a monthly basis, and even larger on a daily basis.

		Effect of Weather due to Winter Extremes on Gross Firm Energy							
	GW.h/DDH	Normal		Record Warm			Record Cold		
	1.0	DDH	GW.h	DDH	GW.h	Effect	DDH	GW.h	Effect
Year:	2012/13	4518	24961	3678	24120	-3%	5439	25882	4%
Month:	Jan 2013	945	2661	663	2378	-11%	1261	2977	12%
Day:	Jan 2013	30	86	6	62	-28%	56	111	30%

		Effect of Weather due to Summer Extremes on Gross Firm Energy							
	GW.h/DDC	Normal		Record Cool Summer			Record Hot Summer		
	3.0	DDC	GW.h	DDC	GW.h	Effect	DDC	GW.h	Effect
Year:	2012/13	188	24961	69	24603	-1%	364	25489	2%
Month:	July 2012	69	1802	6	1614	-10%	142	2021	12%
Day:	July 2012	2	58	0	51	-11%	14	93	61%

The residential sector has a larger proportional effect of weather, varying from an increase of 8% in a record cold winter to a decrease of 7% in a record warm winter, and a possible additional increase of 3% due to a record hot summer and a 2% decrease due to a record cool summer.

		Effect of Weather due to Winter Extremes on Residential Energy							
	GW.h/DDH	Normal		Record Warm			Record Cold		
	0.6	DDH	GW.h	DDH	GW.h	Effect	DDH	GW.h	Effect
Year:	2012/13	4518	7227	3678	6723	-7%	5439	7780	8%
Month:	Jan 2013	945	996	663	826	-17%	1261	1185	19%
Day:	Jan 2013	30	32	6	18	-45%	56	47	48%

		Effect of Weather due to Summer Extremes on Residential Energy							
	GW.h/DDC	Normal		Record Cool Summer			Record Hot Summer		
	1.4	DDC	GW.h	DDC	GW.h	Effect	DDC	GW.h	Effect
Year:	2012/13	188	7227	69	7060	-2%	364	7473	3%
Month:	July 2012	69	426	6	338	-21%	142	528	24%
Day:	July 2012	2	14	0	11	-23%	14	30	120%

Load Variability

The forecast presented in this document is Manitoba Hydro's best estimate of Manitoba's future electricity requirements. Recognizing the potential for variation, load variability is analyzed using a probabilistic-based approach to determine how future actual load may vary from the forecast. This can be used to produce forecasts with a specific probability of occurrence, or can be used to determine the probability of specified loads occurring due to long term economic effects.

The forecast was created with the expectation that there is a 50% chance that the actuals will be higher than forecast, and a 50% chance that the actuals will be lower than forecast. The standard deviation and correlation coefficient of historical weather adjusted load was then applied to the base 50% forecast to give an estimate of the width of the energy and peak confidence bands. 10% and 90% confidence bands (-/+ 1.28 standard deviations) were selected to be a proxy for the Low and High Load Forecast Scenarios for use in risk analysis studies. They are calculated as follows:

Load = Base Forecast -/+ 1.28 x Standard Deviation

For other probability points, substitute for the 1.28 the following numbers:

Prob	0.1%	2.5%	10%	20%	50%	80%	90%	97.5%	99.9%
Z(Prob)	-3.09	-1.96	-1.28	-0.84	0.00	0.84	1.28	1.96	3.09

This calculation gives the variability due to long term economic effects. It does not include variability due to weather which was removed through the use of weather adjusted load.

If variability due to weather is needed, the standard deviation of annual energy or annual peak due to weather has been found to be approximately 2% of the load. This 2% of load can be used as the standard deviation in a probability point calculation. The resulting variance can be added to the economic-based variance if a combined variance is needed. A straight addition of variances can be done because the weather is mostly independent of the economy.

The following four charts and tables summarize the variability for energy and peak. By 2031/32, the Load Forecast could vary by ±2,555 GW.h or ±7.6%.

Figure 20 - Energy Variability

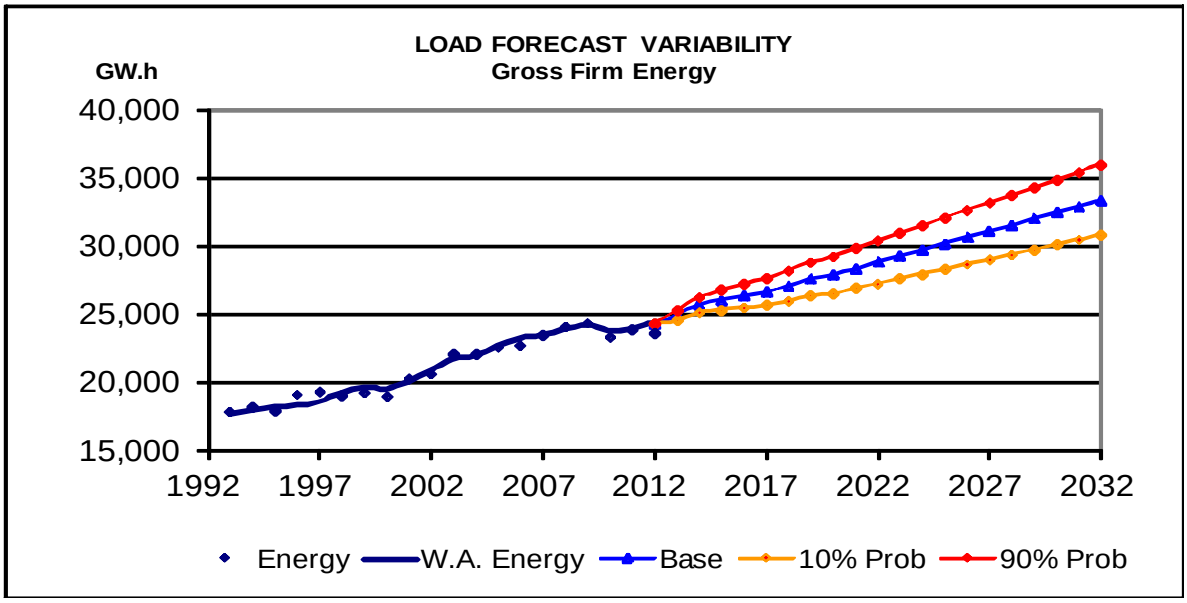


Table 33 – Energy Variability

Fiscal Year	Gross Firm Base Fcst	Long Term Economic Std Dev	10.0% Prob Point	90.0% Prob Point
2012/13	24961	283	24599	25323
2013/14	25734	435	25176	26292
2014/15	26071	561	25351	26790
2015/16	26393	674	25530	27257
2016/17	26677	778	25680	27673
2017/18	27128	876	26005	28250
2018/19	27616	969	26375	28858
2019/20	27919	1058	26562	29275
2020/21	28400	1145	26932	29868
2021/22	28859	1230	27283	30434
2022/23	29322	1312	27641	31004
2023/24	29779	1392	27994	31563
2024/25	30239	1471	28353	32125
2025/26	30691	1549	28706	32676
2026/27	31138	1626	29055	33222
2027/28	31594	1701	29414	33774
2028/29	32053	1775	29777	34328
2029/30	32511	1849	30141	34880
2030/31	32967	1922	30505	35430
2031/32	33425	1994	30870	35980

Figure 21 - Peak Variability

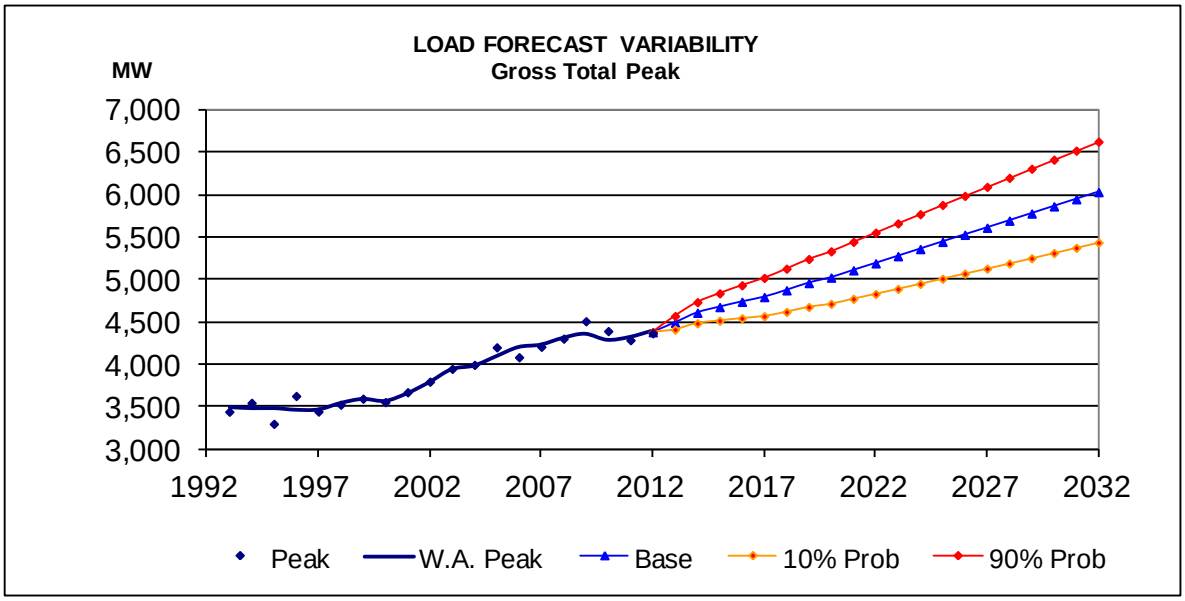


Table 34 – Peak Variability

Fiscal Year	Gross Total Peak Base Fcst	Long Term Economic Std Dev	10.0% Prob Point	90.0% Prob Point
2012/13	4491	62	4411	4570
2013/14	4609	97	4485	4733
2014/15	4676	126	4515	4838
2015/16	4738	152	4544	4933
2016/17	4794	176	4568	5020
2017/18	4874	199	4619	5128
2018/19	4959	221	4677	5242
2019/20	5024	242	4714	5333
2020/21	5109	262	4773	5445
2021/22	5192	282	4830	5553
2022/23	5276	302	4890	5662
2023/24	5360	321	4949	5771
2024/25	5445	339	5010	5880
2025/26	5528	358	5070	5987
2026/27	5611	376	5129	6093
2027/28	5695	394	5190	6200
2028/29	5779	412	5251	6307
2029/30	5863	429	5313	6414
2030/31	5947	447	5375	6520
2031/32	6032	464	5437	6626

5 and 10 Year Forecast Accuracy

The following four charts and tables compare previous load forecasts to actual results 5 and 10 years later.

The evaluated amount of DSM from incentive-based programs between the year the forecast was prepared and the year being forecast was subtracted first from the forecast value. The difference is taken as the accuracy of the forecast.

In general, the objective is to be within 1% for every year being forecast, so the goal is that a five year forecast is within 5% and a ten year forecast is within 10%. Generally this has been achieved in more than half the years for both energy and peak.

The following figures may seem to give the impression that there may be cycles in the forecast made up of alternating periods of over-forecasting and under-forecasting. But these are not so much due to a bias in the forecast as they are due to unexpected periods of recession or economic growth. Once one of these unexpected periods occur, it will affect the accuracy of the previous five 5-year forecasts for 5 years, and the accuracy of the previous ten 10-year forecasts for ten years.

Compensation for these periods of over and under-forecasting cannot be applied until after the events occur and only then can be identified and quantified. The forecast assumes average expected economic conditions. When that does not occur, then the forecast will be high or low.

Station Service was not included in the older forecasts that are being used for this analysis, so Station Service has been left out of the numbers being compared. Station Service is less than 1% of the total load, and would not make a noticeable difference to the results.

Figure 22 - Energy Accuracy

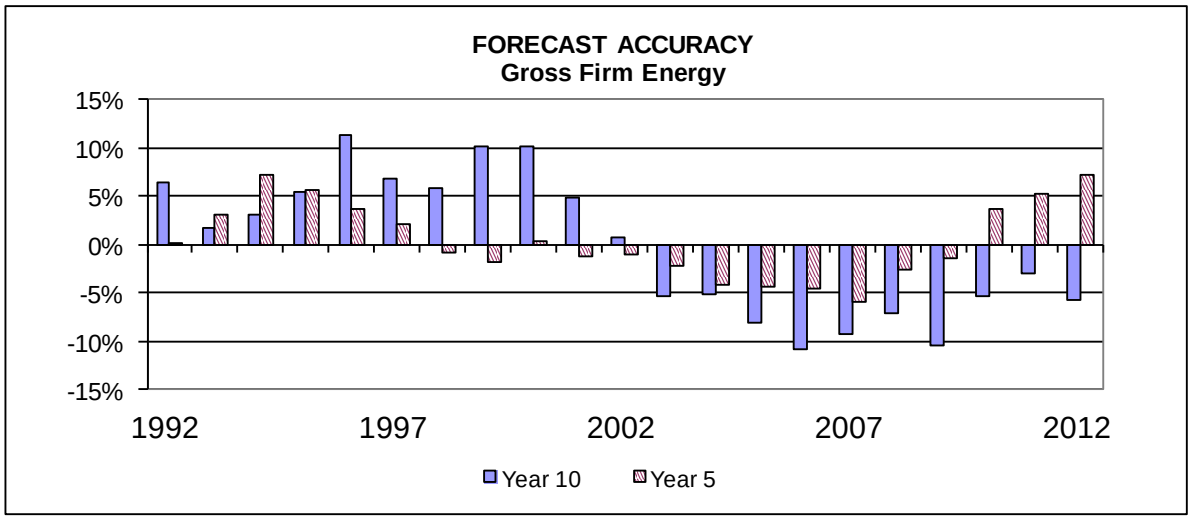


Table 35 - Energy Accuracy

Fiscal Year	Actual Gross Firm Energy	Forecast Prepared 5 Years Previous	W.A. Gross Firm Energy	5 Year Percent Accuracy	Forecast Prepared 10 Years Previous	W.A. Gross Firm Energy	10 Year Percent Accuracy
1991/92	17748	18135	18106	0.2%	19280	18123	6.4%
1992/93	17894	18533	17974	3.1%	18253	17950	1.7%
1993/94	18201	19440	18113	7.3%	18674	18101	3.2%
1994/95	17929	19400	18365	5.6%	19357	18365	5.4%
1995/96	19148	18985	18318	3.6%	20450	18370	11.3%
1996/97	19321	19198	18810	2.1%	19970	18716	6.7%
1997/98	19014	19258	19429	-0.9%	20452	19320	5.9%
1998/99	19273	19476	19818	-1.7%	21696	19708	10.1%
1999/00	18971	19767	19703	0.3%	21611	19629	10.1%
2000/01	20262	20018	20241	-1.1%	21083	20103	4.9%
2001/02	20656	20783	20980	-0.9%	21146	20979	0.8%
2002/03	22110	21395	21861	-2.1%	20703	21868	-5.3%
2003/04	22069	21134	22062	-4.2%	20975	22107	-5.1%
2004/05	22589	21693	22664	-4.3%	20870	22714	-8.1%
2005/06	22757	22216	23277	-4.6%	20812	23346	-10.9%
2006/07	23464	22107	23489	-5.9%	21395	23595	-9.3%
2007/08	24122	23353	23962	-2.5%	22328	24034	-7.1%
2008/09	24417	23926	24259	-1.4%	21756	24320	-10.5%
2009/10	23412	24734	23850	3.7%	22611	23892	-5.4%
2010/11	23892	25270	24020	5.2%	23330	24071	-3.1%
2011/12	23605	25971	24202	7.3%	22986	24376	-5.7%

Figure 23 - Peak Accuracy

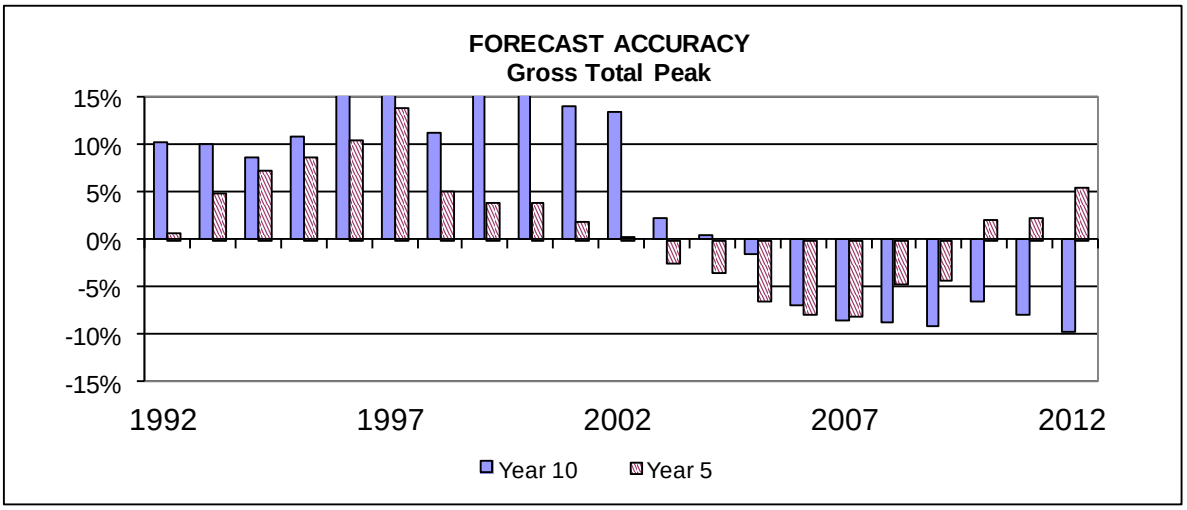


Table 36 - Peak Accuracy

Fiscal Year	Actual Gross Total Peak	Forecast Prepared 5 Years Previous	W.A. Gross Total Peak	5 Year Percent Accuracy	Forecast Prepared 10 Years Previous	W.A. Gross Total Peak	10 Year Percent Accuracy
1991/92	3436	3553	3527	0.7%	3892	3527	10.3%
1992/93	3443	3621	3452	4.9%	3799	3452	10.0%
1993/94	3554	3754	3499	7.3%	3799	3499	8.6%
1994/95	3302	3829	3522	8.7%	3904	3522	10.8%
1995/96	3628	3850	3482	10.6%	4081	3482	17.2%
1996/97	3449	3906	3428	13.9%	3962	3428	15.6%
1997/98	3525	3768	3588	5.0%	3990	3588	11.2%
1998/99	3596	3703	3563	3.9%	4108	3563	15.3%
1999/00	3560	3738	3597	3.9%	4152	3597	15.4%
2000/01	3672	3758	3688	1.9%	4210	3688	14.1%
2001/02	3799	3759	3747	0.3%	4251	3747	13.5%
2002/03	3951	3801	3902	-2.6%	3989	3902	2.2%
2003/04	3994	3833	3975	-3.6%	3990	3975	0.4%
2004/05	4201	3817	4084	-6.5%	4023	4084	-1.5%
2005/06	4085	3860	4192	-7.9%	3899	4192	-7.0%
2006/07	4221	3894	4233	-8.0%	3868	4233	-8.6%
2007/08	4308	4097	4302	-4.8%	3927	4302	-8.7%
2008/09	4509	4161	4347	-4.3%	3948	4347	-9.2%
2009/10	4393	4371	4277	2.2%	3993	4277	-6.6%
2010/11	4286	4406	4308	2.3%	3967	4308	-7.9%
2011/12	4367	4617	4380	5.4%	3953	4380	-9.7%

POSSIBLE EVENTS

Manitoba Hydro examines possible events of interest for their potential impact on system load requirements. These events are deemed to be captured within the overall load variability analysis of the forecast. Although not specifically identified within the analysis, they are presented so their individual effects may be considered from a sensitivity perspective if the need arises. These events are summarized in the following table.

	Energy Effect (GW.h)	Peak Effect (MW)
Climate Change per Degree Celsius Warmer	+100	-40
One New Very Large Industrial Customer	+1,500	+180
One Less Very Large Industrial Customer	-1,500	-180
Additional Load if Electric Vehicles Grow to 70%	+1,666	+208
10% of all Res Customers switch to Electric Heat	+746	+243
10% of all Res Customers switch to Electric Water Heaters	+202	+23

To provide context for the previous table, one year of energy growth is approximately 450 GW.h and one year of peak growth is approximately 80 MW.

Climate Change

The Intergovernmental Panel on Climate Change projects an increase in global temperature as a result of rising concentrations of greenhouse gases in the atmosphere. Changes to temperature and extreme events have the potential to influence future energy demands.

In the last 100 years, the city of Winnipeg's 25-year average temperature has resulted in Degree Days Heating (DDH) in the range of 4500 to 5000 each year. A 25 year moving average has been selected for the forecast to help minimize the effects of year to year variability and to represent the long term climatology. This section quantifies the general effect caused by a 1°C increase in average daily temperature throughout the year.

In Manitoba Hydro's case, if Winnipeg experienced a uniform 1°C warming throughout the year, winter months would be subject to less heating while summer months would be subject to more cooling. Over 200 winter days, every degree Celsius of temperature rise above average conditions will result in an approximate decrease of 200 Degree Days Heating (DDH) per year, and a corresponding approximate increase of 100 Degree Days Cooling (DDC) per year over 100 summer days.

Applying the Weather effect for Manitoba Hydro at Generation gives:

Decrease of 200 DDH ➔ -200 GW.h and -40 MW in the winter

Increase of 100 DDC ➔ +300 GW.h and +120 MW in the summer

The resulting total effect of every one degree increase in temperature would be:

An increase of 100 GW.h to annual energy and a decrease of 40 MW to system peak.

	Energy (GW.h)	Peak (MW)
Climate Change per Degree Celsius Warmer	+100	-40

Potential Load from Very Large Industrial Customers

This forecast includes an expectation that there may be new large industrial users of electricity that may come to Manitoba. GS Top Consumers includes a Potential Large Industrial Loads category that adds 1,700 GW.h to GS Top Consumers by 2031/32. This is expected to be made up of increases and decreases by current top consumers, additions of new top consumers and company closures. However, this forecast does not anticipate the scenario of a single customer using up the entire PLIL category.

Manitoba Hydro's largest customer currently uses in excess of 1,500 GW.h annually and has a coincident peak load of about 180 MW. It is feasible that one or more customers of this size could decide to start up in Manitoba in the next 20 years. A single large new customer could use the entire 1,700 GW.h of energy that has been reserved in the Potential Large Industrial Loads category.

Similarly, there is a chance that one or more very large customers can close down. This could also be the equivalent of losing Manitoba Hydro's largest customer.

	Energy (GW.h)	**Peak (MW)**
Additional Load for one new very large customer	+1,500	+180
Loss of Load for the loss of our largest customer	-1,500	-180

Potential Load from High Adoption of Electric Vehicle Technology

This forecast already assumes there will be a noticeable impact due to adoption of electric vehicles within Manitoba over the next twenty years. The specifics have been detailed in the Plug-In Electric Vehicles section of this document.

But there is a possibility that the current technological challenges will be solved. The U.S. Government is committed to fund and support the technology as a means to help reduce the nation's dependence on oil. Should breakthroughs and advances in battery technology happen in the next few years, it is possible that electric vehicles may grow to be the dominant vehicle. Under this assumption, electric vehicles may grow to be 70% of the market share in 40 years.

Assuming 70% of all vehicles in Manitoba in 2031/32 are Plug-In Electric Vehicles (PEVs), then these vehicles would use 1,720 GW.h and 215 MW. Currently, the forecast includes 54 GW.h and 7 MW for PEVs, therefore 70% saturation would be an increase of 1,666 GW.h (almost 4 years of load growth) and 208 MW (about 2½ years of peak growth).

	Energy (GW.h)	**Peak (MW)**
Additional Load with 70% Electric Vehicle Saturation Rate	+1,666	+208

Increased Residential Use of Electricity for Space heat

Under current natural gas prices, it is cheaper to heat one's home with natural gas than with electricity. This forecast assumes that natural gas will retain its price advantage over electricity over the next 20 years. The forecast is that by 2031/32, 234,363 or 40.6% of Residential Basic customers will heat their home with electricity.

However, there is a possibility that more customers could switch to electric space heat. If the percentage of electric heat billed customers rises by 10% to 50.6%, then by 2031/32, 292,018 electric heat customers would use 24,612 kW.h each, and 284,528 other customers would use 11,666 each. Total usage would be 746 GW.h higher than forecast (almost 2 years of load growth) in 2031/32. At a 35% load factor, this would add 243 MW to the peak (3 years of peak growth).

	Energy (GW.h)	Peak (MW)
10% of all Res Customers switch to Electric Heat	+746	+243

Increased Residential Use of Electricity for Water heat

New homes are now primarily built with electric water tanks rather than natural gas water tanks regardless of their space heat fuel choice. In existing homes, as standard and mid-efficiency gas furnaces are being replaced with a high efficiency gas furnace, some homeowners are choosing to replace their existing natural gas water heaters with electric water heaters.

However, there is a possibility that more customers could switch to electric water heaters. If the percentage of customers with electric water heaters rises by 10% to 79.1%, then by 2031/32, 57,655 additional electric water tanks would use 3,500 kW.h each. Additional usage would be 202 GW.h (about ½ year of load growth). At a 100% load factor, this would add 23 MW to the peak (about ¼ of a year of peak growth).

	Energy (GW.h)	Peak (MW)
10% of all Res Customers switch to Electric Water Heaters	+202	+23

ASSUMPTIONS

Economic Assumptions

Economic forecast assumptions are taken from the 2012 Economic Outlook and the 2012 Energy Price Outlook. These documents contain Manitoba Hydro's forecasts of economic variables including prices of electricity, natural gas and oil, Gross Domestic Product (GDP), Manitoba population and residential customers.

The following are the economic variables used in the preparation of this Electric Load Forecast:

Residential Customers - The number of Residential Basic customers in Manitoba is forecast to increase by 1.2% (5,581 units) in 2012/13 and averages 1.2% per year over the forecast period. This compares to a historical average increase of 0.9% per year over the last ten years. This is used in the Residential and GS Mass Market customer forecasts.

Electricity Prices - The electricity price forecast is based on CPI and rate increase projections contained in the Integrated Financial Forecast. The nominal electricity price is forecast to increase by 2.0% in 2012/13, increase 3.5% per year until 2023/24 and then increase by 2.0% per year throughout the rest of the forecast period. This is used in the Residential customer forecast.

Natural Gas Prices – Manitoba Hydro views the natural gas price forecast as commercially sensitive information. Consistent with the Clean Environment Commission and Electric General Rate Application, this information will not be publicly disclosed. This is used in the Residential customer forecast.

Gross Domestic Product (GDP) - Real economic growth in Manitoba is forecast to be 2.3% in 2012/13. It is expected to stay at approximately that level for several years, then decline to 1.7% by 2019/20 and remain at that level for the remainder of the forecast period. This is used in the GS Mass Market customer forecast.

Normal Weather Assumptions

Weather for forecast purposes is measured by degree days. Winnipeg temperatures are used, as Winnipeg is central to most of the weather-dependent load (Residential and General Service Mass Market) in Manitoba.

Cold weather is expressed in Degree Days Heating (DDH), which is the number of average degrees colder than 14 degrees Celsius each day. Hot weather is expressed in Degree Days Cooling (DDC), which is the number of average degrees warmer than 18 degrees Celsius each day. Daily temperature is the average of the high and low temperature for the day. The equations are:

DDH = sum (max(0, 14 - (Daily high + Daily low) / 2))

DDC = sum (max(0, (Daily high + Daily low) / 2) - 18)

The base temperature of 14 degrees for DDH is the temperature below which most buildings have their heating systems (furnaces) running.

The base temperature of 18 degrees for DDC is the temperature above which buildings start to run their space cooling systems (air-conditioning).

The forecast is prepared assuming normal weather. Normal weather is determined from the 25 year average of Degree Days Heating and Degree Days Cooling in Winnipeg over the period April 1987 to March 2012.

The 25 year weather normals used for every year of this forecast are 4,518.4 DDH and 188.1 DDC. This is a decrease of 18.3 DDH from last year's normal of 4,536.7 DDH, and an increase of 3.9 DDC from last year's normal of 184.2 DDC.

The range of DDH from 1987 to 2012 was from a warm winter of 3,677.6 DDH in 2011/12 (840.8 DDH below normal) to a cold winter of 5,439.3 DDH in 1995/96 (920.9 DDH above normal).

The range of DDC from 1987 to 2012 was from a cool summer of 71.8 DDC in 2004/05 (116.3 DDC below normal) to a hot summer of 364.1 DDC in 1988/89 (176.0 DDC above normal).

Demand Side Management (DSM) in the Forecast

This forecast reflects future DSM savings associated with improved equipment efficiency standards and existing Provincial building codes. This is the only DSM initiative that is specifically accounted for in the forecast.

Savings due to DSM programs to date are embedded in the historical data that is the basis for this forecast. The current level of past achieved DSM savings is assumed to remain in place throughout the future. Future DSM savings arising from future Power Smart offerings and market engagement above the current level and incremental to the above mentioned standards and codes are treated as a supply-side resource and are not included in this document. They are accounted for separately in Manitoba Hydro's Power Smart Plan and Power Resource Plan.

For customers involved in DSM initiatives such as the Load Displacement and Alternative Energy, the most recent years of history are used as the basis of their forecast. Any increase or loss to their alternative energy supply will not be included in the forecast, and are accounted for with the other DSM initiatives within the Power Smart Plan.

METHODOLOGY

Residential Basic Methodology

The Residential Basic forecast was calculated using a detailed end use approach. The forecast of the total number of Residential Customers was from Manitoba Hydro's 2012 Economic Outlook. The 2009 Residential Energy Use Survey provided current end use saturation rates, detailed information on newly constructed dwellings, and appliance age distributions and their expected lifetimes. The end use assumptions include usage information and efficiency improvement information. The number of appliances and their estimated usage were multiplied together to calculate an energy forecast for each end use, and then all uses were combined to calculate the total use for the Residential End Use Forecast.

a) Total Number of Residential Customers - The Economic Analysis Department forecast the total number of residential customers for the 2012/13 to 2031/32 period. This customer forecast was the primary input for the Residential End Use Model.

b) Customers by Dwelling Type and Area - The 2009 Residential Survey was used to estimate the number of customers to various dwelling types (Single Detached, Multi-family Attached, and Individually-Metered Apartments). Single detached dwelling types are sub classified as Winnipeg, Gas Available Areas Outside of Winnipeg, and Gas Unavailable Areas.

c) Customers by Heating Type - Each combination of Dwelling Type and Area are divided into two groups: Electric Heat Billed customers and Other Heat customers. Electric Heat Billed customers pay for their space heat with their electricity bill. Other Heat customers may use natural gas or propane, or may use electric heat but are not billed directly.

For Single Detached Homes in Gas Available Areas Excluding Winnipeg, the number of newly constructed homes choosing electric heat was econometrically forecast using the following equation:

Change in Percentage of Newly Constructed Single Detached Homes in Gas Available Areas Outside of Winnipeg with Electric Heat Billed (t)

= 0.001 + 0.668 x Chg PG/PE

Change in PG/PE

= Price of Gas per mmBTU (t-1) / Price of Electricity per mmBTU (t-1)

- Price of Gas per mmBTU (t-2) / Price of Electricity per mmBTU (t-2)

R-squared: 44.6%

T-stats:

Constant : 0.14

Chg PG/PE : 3.81

The same model with different coefficients was used to forecast heating appliances in newly constructed single detached homes in Winnipeg.

d) Appliance Forecast - Historical saturation and age distribution data was collected from the 2009 Manitoba Hydro Residential Survey. Saturations were forecast using a birth/death/replacement model.

e) Average Appliance Usage - The current estimates of annual appliance usage, also called Unit Energy Consumptions (UECs) were calculated using Residential Survey information, Conditional Demand Analysis techniques, and expert opinion. The survey results were screened for consumption records and survey completeness. Missing values for the size of home, people per household and income questions were imputed. Degree days heating/cooling and demographic factors such as income and people per household were added to help explain usage variations. They were then normalized for the average customer.

f) New Appliance Usage - New end uses are typically more efficient than existing stock. UECs for new appliances were calculated and these were used in the birth/death/replacement model.

g) Total Energy Use - The forecast number of appliances was multiplied by the forecast UECs to get the forecast kW.h per appliance. The appliance usages were summed to get the total use for the Residential Basic rate class. Efficiency improvements due to future standards that were not handled by the birth/death/replacement model were handled separately. Two-thirds of the Plug-In Electric Vehicle forecast was added to the Residential GW.h. (The other one-third of the electric vehicle forecast was allocated to the General Service Mass Market forecast.)

General Service Mass Market Methodology

There are four rate classes in the General Service Mass Market sector:
i) Small Non-Demand (0 to 50 kV.A),
ii) Small Demand (50 to 200 kV.A),
iii) Medium (above 200 kV.A but do not own transformation capabilities), and
iv) Large (above 200 kV.A and own their own transformation capabilities).

Total GW.h for the General Service Mass Market sector is forecast by multiplying the forecast number of customers in each rate class by the forecast average use per customer in each rate class. The total number of customers in the GS Mass Market sector is forecast using econometric models, and then the total is allocated among the rate classes based on historical data. The average use per customer is forecast using the five year average for each rate class.

One-third of the Plug-In Electric Vehicle forecast is added to the GW.h for the Small Non-Demand rate class. (The other two-thirds of the electric vehicle forecast are allocated to the Residential forecast.) Forecast savings from future standards and construction codes are taken off of the forecast to calculate the Total Use.

General Service Mass Market Customer Forecast

Econometric analysis of sales data is used to develop models for the number of customers. Forecasts of Manitoba GDP and Manitoba Hydro Residential Customers from the Manitoba Hydro 2012 Economic Outlook are then input into the models, which generate forecasts for the number of customers for each year of the forecast period.

The number of customers at fiscal yearend was forecast using the following calculations for each year (t):

Number of Customers (t)
= Number of Customers (t-1)
+ Change in the Number of Customers (t)

Change in the Number of Customers (t)

= Number of Customers (t-1)

x Percentage Change in Number of Customers (t)

The percentage change in number of customers was modeled using yearend historical customer data from 1984/85 to 2011/12. The resulting model and parameters are as follows:

Percentage Change in Number of Customers (t)

= -0.002 + 0.135 x CGDP + 0.629 x CRES

CGDP - Annual Percentage Change in Manitoba Gross Domestic Product

CRES - Annual Percentage Change in Residential Basic Customers

R-squared: 54.5%

T-stats:

Constant	: -1.27
CGDP	: 3.55
CRES	: 3.44

General Service Mass Market customer growth is allocated to Medium and Large classes using their 10 year average percentage of Mass Market customer growth, the Small Non-Demand class is allocated 10% of new customers, and the rest of the growth is allocated to the Small Demand class.

General Service Mass Market Average Use Forecast

The average use for each rate class is forecast to remain at its five year average over the forecast period. Specifically these are:

i) Small Non-Demand - 31,027 kW.h per year

ii) Small Demand – 166,454 kW.h per year

iii) Medium - 1,582,552 kW.h per year

iv) Large - 5,877,414 kW.h per year

Top Consumer customers are excluded from these classes for forecasting purposes.

Customers are assigned to a rate class depending on their usage. If usage by an individual customer increases (or decreases) sufficiently then they will be re-assigned to the appropriate rate class. These shifts tend to offset each other over time so individual classes have not shown significant upward or downward trends in average use. By definition, the truncation of these classes results in relatively stable average use for each class.

General Service Mass Market Total Use Forecast

Total Use (t)

= Number of Small Non-Demand Customers (t)

x Average Annual Use of Small Non-Demand Customers (t)

+ 1/3 of Plug-in Electric Vehicle Forecast

+ Number of Small Demand Customers (t) x Average Annual Use of Small Customers (t)

+ Number of Medium Customers (t) x Average Annual Use of Medium Customers (t)

+ Number of Large Customers (t) x Average Annual Use of Large Customers (t)

- Forecast Savings from Construction Codes (t)

General Service Top Consumers Methodology

Top Consumers is made up of the largest electricity users of Manitoba Hydro. The general criterion is that a company needs to have used 50 GW.h in a year, or have the potential to consume 50 GW.h in a year. A Top Consumer is not necessarily located in one place, but may consist of services at number of locations throughout the Province. A Top Consumer will be one company, but may count as multiple billing customers.

Each company in the Top Consumers group is forecast individually. Information on individual company operating plans is collected from industry news, Manitoba Hydro's economic experts and Manitoba Hydro's Key & Major Account representatives. This information is used to prepare company specific forecasts.

Normally, information is only available over the next 3 to 5 years for any company. These short term considerations are taken into account, and then the company's forecast remains constant.

To account for longer term growth in this group of consumers, a special classification called Potential Large Industrial Loads (PLIL) has been created. PLIL is used instead of attempting to forecast each consumer individually for the long term. It represents the natural growth of all the top consumers as a group, as well as unexpected major expansions, new customers, or loss of customers from GS Top Consumers.

Starting in 2014/15, 100 GW.h a year is forecast for PLIL to account for unforeseen expansion, contraction and growth. This will result in the addition of 1,700 GW.h of PLIL after 20 years.

Electric Vehicles

The methodology for forecasting Electric Vehicles was to research relevant recent literature and to apply appropriate assumptions from this literature to Manitoba's situation. Historical data on automobile registrations per year in Manitoba was used to help estimate future trends. The forecast section on Electric Vehicles provides the details.

Other Sectors

Seasonal, Water Heating, Lighting

Most of the smaller sales sectors, including Seasonal, Flat Rate Water Heating and Area and Roadway Lighting were done by analysis of changes in the number of customers or services and in changes in average use per customer or service. Growth rates were applied based on history and a best estimate as to what the future will bring.

Diesel

Each of the diesel towns was individually forecast. An additional forecast was produced assuming that the customers would be converted to the Integrated System and given 200 amp service which would allow electric heating.

Monthly Sales Allocations

Monthly percentages of customer growth through the year and GW.h for the month of the year were averaged for the past five years. These were then applied to the forecast annual customers and kW.h to get the monthly forecast.

Monthly System Energy and Peak

An hourly load model was developed using econometric modeling techniques to determine the hourly load shape of the system. This load shape was used to forecast monthly system energy, annual system peaks, and monthly system peaks.

Data used in the hourly load model included hourly data for Common Bus, Top Consumers, and the larger GS Mass Market customers. Load research sample data was used to estimate Residential and smaller Mass Market customers. Twenty-five years of hourly temperature data were used to simulate the hourly load shape for each sector.

The modeled load shape of each sector was applied to the annual energy forecast to determine each sector's contribution to peak demand. The sectors were summed to get an hourly forecast of General Consumers Sales. Distribution Losses were calculated as a percentage of sales using the five year average of annual distribution losses. Transmission losses were calculated for each month as a percentage of Common Bus using the five year average for each month.

General Consumers Sales, losses, and miscellaneous loads were added to arrive at the forecast hourly system load for Manitoba. The maximum hourly loads in each month were used to estimate the monthly System peak and annual System peak.

GLOSSARY OF TERMS

Area and Roadway Lighting sector - includes electricity sales for the Sentinel Lighting and Street Lighting rate groups.

Common Bus - is the total load measured from all the distribution points (i.e. substations) within Manitoba. It includes all energy supplied to General Consumers Sales customers, Construction Power plus associated Distribution Losses, but excludes Diesel customers, Transmission Losses and Station Service.

Customer – Most metered electrical services count as a customer. Unmetered services such as flat rate water heating and sentinel rental services do not count as a customer. Street lighting counts all the services grouped as a premise as one customer.

Curtailable - is a load that can be curtailed on short notice. A discount is given for subscribing to this program. Curtailable loads can affect peak demand because some periods of curtailment may be at or near the system peak.

Degree Days Cooling (DDC) - DDC is a measurement designed to reflect the demand for energy needed to cool a building. DDC is the number of degrees warmer than 18 degrees Celsius each day is, based on the average of the high and low temperature of the day.

DDC = sum (max(0, (Daily high + Daily low) / 2) - 18)

Degree Days Heating (DDH) – DDH is a measurement designed to reflect the demand for energy needed to heat a building. DDH is the number of degrees colder than 14 degrees Celsius each day is, based on the average of the high and low temperature of the day.

DDH = sum (max(0, 14 - (Daily high + Daily low) / 2))

General Consumers Sales - includes the energy supplied to all of Manitoba Hydro's individually billed customers. It excludes export sales.

General Service Mass Market - includes all Commercial and Industrial customers, excluding the Top Consumers group.

General Service sector - made up of sales to Commercial and Industrial businesses served by Manitoba Hydro. This sector consists of five rate groups (Basic, Diesel, Seasonal, Flat Rate Water Heating and Surplus Energy Program).

General Service Top Consumers - is made up of the largest electricity users of Manitoba Hydro.

Gross Firm Energy - is the energy required to serve Manitoba Hydro's customers on the Integrated System. It excludes exports, interruptible (non-firm) loads and diesel customers.

Gross Total Peak - is the maximum integrated (i.e. average) hourly load required to serve Manitoba Hydro's customers on the Integrated System. It excludes exports and diesel customers. It includes curtailable loads.

GW.h (gigawatt-hour): The unit of energy primarily used in this document. One GW.h equals one million kW.h (kilowatt-hours), which is approximately equal to the energy of 100 typical homes not using electricity for heating, or 40 homes that use electricity for heating.

Integrated System - is the power grid that connects Manitoba Hydro's generation sources to its customers. All Manitoba Hydro's customers except diesel are on the Integrated System.

Interruptible (Non-Firm) Energy - includes all energy sold to Manitoba customers on a non-firm basis. Currently, the only rate group for this is the Surplus Energy Program (SEP).

kW.h/cust (kilowatt-hours per customer): The unit of energy primarily used in this document to represent the average use of one customer. The total usage in GW.h of a group of customers is divided by the number of customers and then multiplied by one million.

Load Factor - is the ratio of the average hourly energy over a period, usually a year, divided by the energy used at a specific hour, usually the hour of system peak. A load factor of 25% means that the average energy is one-quarter of what is used at system peak. A Load factor greater than 100% means that the average hourly energy is more than what is used at system peak. Given a specific energy, a lower load factor means a higher peak. The equation is:

Load Factor = (Total Energy / Hours) / (Energy over the hour of system peak)

Manitoba Load at Common Bus - is the total load measured from all the distribution points (i.e. substations) within Manitoba. It includes all energy supplied to General Consumers Sales customers plus associated Distribution Losses, but excludes diesel customers, Transmission Losses and Station Service.

MW (megawatt): The unit of peak demand primarily used in this document. One MW is a million watts. One thousand MW of peak demand for one hour equals one GW.h of energy. Alternatively, one MW for a thousand hours also equals one GW.h of energy.

Net Firm Energy and **Net Total Peak** - are the same as Gross Firm Energy and Gross Total Peak except they exclude Station Service. The reporting of Manitoba Load in the Load Forecast used "Net" until 2008. It presented both until 2011. Starting with the 2012 forecast, only the "Gross" is presented. Net can be calculated when needed by subtracting Station Service from the Gross.

Residential Basic – is the primary residential customer group made up of single detached and multi-family dwellings as well as individually metered apartment suites.

Residential sector - made up of sales to residential customers for non-business operations. The Residential sector is comprised of four rate groups (Basic, Diesel, Seasonal, and Flat Rate Water Heating).

Station Service - is the energy used by power plants to generate power and service their own load.