Volume 1 – Board Counsel's Book of Documents
Manitoba Hydro 2014/15 and 2015/16 GRA

Tab #	Description	Reference
Export Revenue		
1	Total export sales	Tab 9, Figures 9.8 Tab 9, Figures 9.9 Tab 9, Figures 9.6 Tab 9, pp. 10-12
2	Gross export & net export revenue	PUB/MH I-10(b) Analysis IFF14 vs IFF14B Updated Interest and Exports.xlsx PUB/MH II-81(a-c)
3	Average unit revenue/cost	Exhibit MMF-31 NFAT Appendix 11.19 MFR1, pp 2-4 Coalition/MH I-24(a), pp 2-7 PUB/MH II-89 IFF Revised
4	Opportunity Exports - Summer & Winter	Table 7, Appendix 11.21 Revised PUB/MH II-79
5	Average Unit Export Revenue historical trend and the forecast impact of carbon regulation	PUB/MH II-83(a-c) PUB/MH II-41(a&b) PUB/MH II-31(a&b) Coalition/MH I-24(h) PUB/MH II-87(c-d)
6	Natural Gas Prices & Export Prices	PUB/MH I-81(a), pp3-5 PUB/MH I-81(b), pp3&4
7	US- EPA impact on MH Exports	PUB/MH I-69(a), pp1&2 PUB/MH I-69(f),
8	Exchange Rate Revenue	PUB/MH I-13
9	Exchange Rate Forecast Update	Coalition/MH I-103(b&c)
10	Gross and Net Export Revenues related to Conawapa	PUB/MH I-5(c) pp3&4
11	Total Exports vs. Hydraulic Generation	PUB/MH I-56(c)-Tab#11
12	NEB - Export Data	NEB Data Appendix 11.20 Revised_MFR3 PUB/MH II-11 Graph E IR Round II

Volume 1

Tab #	Description	Reference
13	NEB – Export Data	PUB/MH I-16d
14	Firm Energy Exports	PUB/MH II-65 (a-d)
15	Summer & Winter Energy Sales	Appendix 11.21 pp4&5
16	Wind Energy Purchases and Export Sales	Appendix 11.21 Revised - pp1to5 Appendix 11.22 - MFR6 PUB/MH I-83c, p2
17	MISO Energy Sales	PUB/MH II-63
Power Resource Plan		
18	Power Resources – Pipeline Load and DSM	PUB/MH I-58, Attachment #1, Figures 3&4
19	Power Resources – DSM Impacts	PUB/MH I-59(a-b), pp.6&8 Appendix 3.3, IFF14, pp36-39 PUB/MH I-59(a-b), pp.1-6
20	No New Resources – System Shortfalls	PUB/MH I-58 Attachment 1, pp17-20 Appendix 3.3 - IFF14 - Electricity Supply
21	PRP Recommended Plan	PUB/MH I-58 Attachment 1, pp21-24 PUB/MH I-58 Attachment 1, pp14-15
22	Power Resources – Import Contracts	PUB/MH I-58 Attachment 1, pp11
23	Natural Gas CCGT/ Imports	PUB/MH I-58 Attachment 1, pp11-15 PUB/MH I-59(a-b), pp.2-4 PUB/MH I-59 a-b pg. 6 & 8
24	No New Resources Contract Obligations	PUB/MH I-58 Attachment 1, pp4-6 PUB/MH I-64(a) pp2-5 PUB/MH II-63
25	No New Resources – MH's Market Rules	PUB/MH I-58 Attachment 1, pp17-19

Tab #	Description	Reference
26	No New Resources – Drought Risk	MIPUG/MH I-9 PUB/MH II- 77(d) Appendix 9.1, p2
27	No New Resources – Drought Impact	MIPUG/MH I-8 Appendix 11.21 Revised MFR4, p3 PUB/MH II-77(a-c) PUB/MH II-367, NFAT, pp 1&2
28	No New Resources – Corporate Risk Management	PUB/MH II-85(a- b) PUB/MH II- 86(a-b)
29	No New Resources – system firm winter & summer peak demand and capacity resources	Appendix 11.48 MFR2 PUB/MH I-58 Attachment 1, p4 Coalition/MH I-37(b) Appendix 11.46 MFR3 NFAT MH Exhibit #176-1
30	No New Resources IFF14 vs. IFF13	PUB/MH I-58 Attachment 1, pp. 5-6
31	LWR License Renewal	PUB/MH I-80(a), pp5,6&11,12 PUB/MH I-80(c), Attachment 1, pp3&4

1

The average price received for opportunity energy softened considerably in 2009/10 and, as shown in Figure 9.6, on-peak prices dropped more in relative and absolute terms than off-peak prices. As previously noted, spot and short-term energy prices decreased by approximately 50% in 2009 primarily as a result of significantly lower natural gas prices. In addition, modest load growth since 2009, the establishment of the MISO Ancillary Services Market, and the large scale development of new wind resources in North Dakota and Minnesota have also put downward pressure on energy prices.

Figures 9.8 and, 9.9 provide export volumes, revenues and average prices for the various export sales aggregated over all on and off-peak hours. Figure 9.8 summarizes annual total exports volumes, revenues and prices for Dependable, Opportunity and Merchant sales. Figure 9.9 shows Dependable and Opportunity Sales for the US market only.

Figure 9.8 Total Export Sales

TOTAL SALES									
	DEPENDABLE SALES			OPPORTUNITY SALES			SYSTEM MERCHANT SALES		
	GWh	CAD $M	AvgPrice	GWh	CAD $M	AvgPrice	GWh	CAD $M	AvgPrice
2000/01	6,352	258	40.64	5,801	217	37.39	0	0	0
2001/02	6,277	322	51.65	6,022	281	46.63	0	0	0
2002/03	6,544	339	53.37	3,191	137	42.97	0	0	0
2003/04	6,231	295	48.46	735	52	48.46	11	0.5	44.43
2004/05	5,633	290	51.44	4,798	239	51.44	315	11	33.32
2005/06	4,044	240	59.25	10,303	510	47.73	919	63	60.07
2006/07	3,654	218	59.67	6,250	295	46.53	1,206	60	43.38
2007/08	3,921	209	53.22	7,099	328	44.42	1,262	72	49.17
2008/09	4,087	233	57.12	6,039	287	43.64	1,598	86	48.08
2009/10	3,263	186	56.99	7,597	184	22.98	775	26	28.29
2010/11	3,377	172	51.09	6,967	181	24.77	712	27	36.93
2011/12	3,742	175	46.79	6,502	152	22.18	436	17	31.10
2012/13	3,636	177	48.69	5,451	146	25.18	150	9	34.18
2013/14	3,479	182	52.22	7,058	203	28.92	331	34	63.32
2014/15[a]	2,569	140	54.61	5,667	159	26.92	409	14	34.24

(b) Fiscal year through December 2014.

Figure 9.9 U.S. Export Sales

TOTAL U.S. SALES									
	U.S. DEPENDABLE SALES			U.S. OPPORTUNITY SALES			U.S. SYSTEM MERCHANT SALES		
	GWh	CAD $M	AvgPrice	GWh	CAD $M	AvgPrice	GWh	CAD $M	AvgPrice
2000/01	4,895	199	40.69	4,511	167	36.95	0	0	0
2001/02	4,767	263	55.15	5,083	247	48.66	0	0	0
2002/03	4,947	277	56.09	2,713	115	42.30	0	0	0
2003/04	5,245	259	49.45	507	35	69.42	0	0	0
2004/05	5,633	290	51.44	3,218	171	54.48	109	1	10.64
2005/06	4,044	240	59.25	8,879	401	45.12	0	0	0
2006/07	3,654	218	59.67	5,877	270	46.24	0	0	0
2007/08	3,921	209	53.22	6,618	289	44.19	0	0	0
2008/09	4,087	233	57.12	5,622	237	43.24	0	0	0
2009/10	3,263	186	56.99	7,224	160	22.28	33	2	0
2010/11	3,377	172	51.09	6,062	146	24.44	5	0.3	37.82
2011/12	3,742	175	46.79	5,616	117	21.13	80	3	35.21
2012/13	3,636	177	48.69	4,690	113	23.62	63	2	29.92
2013/14	3,479	182	52.22	6,336	182	27.70	185	7	37.17
2014/15[a]	2,569	140	54.61	4,948	134	25.79	400	13	33.66

(a) Fiscal year through December 2014.

Long-Term Sales – New Agreements and Sales under Negotiation

Manitoba Hydro has a number of signed long-term power sales agreements, several requiring the construction of Keeyask and new transmission in Manitoba and the US. Over the past year, Manitoba Hydro has also signed several memorandum of understandings to continue discussion on new arrangements in the post-2020 timeframe both in the U.S. and Canada.

All long-term sales agreements, term sheets, memorandum of understandings and discussions are protected by confidentiality provisions and mutual non-disclosure agreements signed by Manitoba Hydro and the respective counterparty. Therefore, specific pricing and terms and conditions cannot be provided in a public forum.

Xcel Energy Power Sale Agreements

On May 27, 2010, Manitoba Hydro and Xcel Energy entered into three agreements providing for (i) the sale to Northern States Power of 375 megawatts of system power in

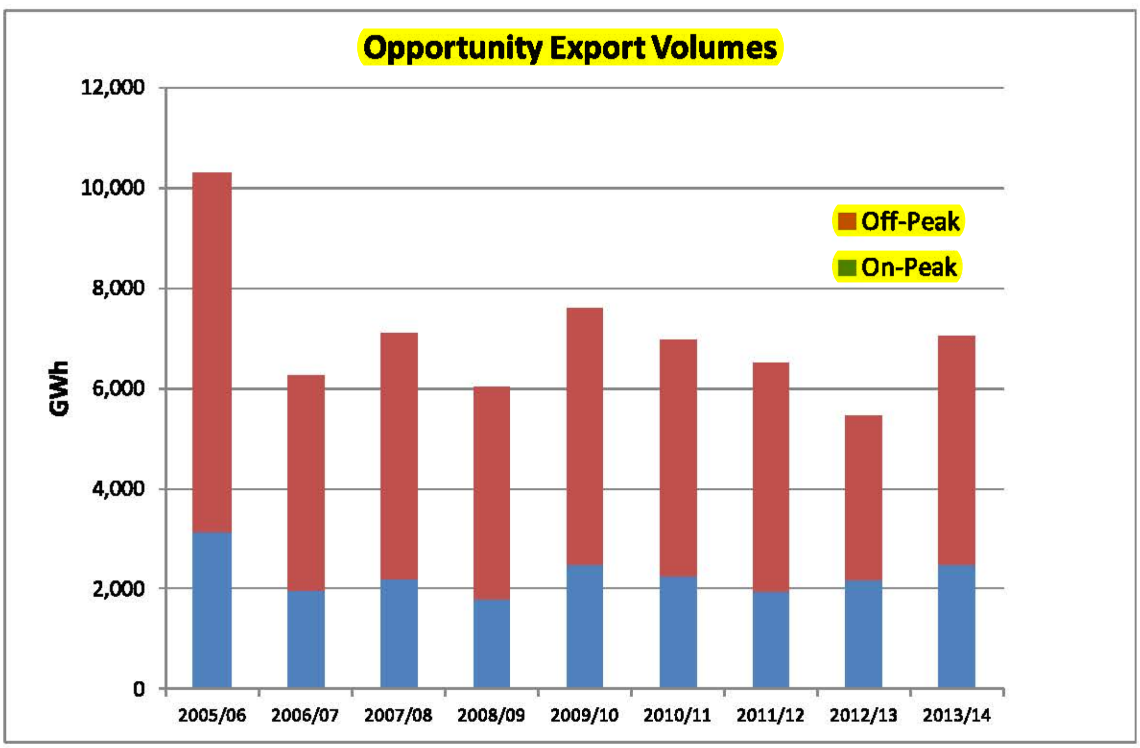
7

Figure 9.6 Opportunity Export Sales

OPPORTUNITY EXPORTS						
	On Peak GWh	Off Peak GWh	On Peak Avg Price (CAD$)	Off Peak Avg Price (CAD$)	On Peak Revenues (CAD $M)	Off Peak Revenues (CAD $M)
2005/06	3,142	7,161	72.73	36.75	245	265
2006/07	1,972	4,278	66.26	37.44	135	160
2007/08	2,212	4,887	66.19	32.97	162	166
2008/09	1,802	4,237	71.78	29.37	153	134
2009/10	2,497	5,100	31.14	18.74	84	100
2010/11	2,268	4,699	31.90	21.23	76	105
2011/12	1,952	4,550	28.76	22.51	59	93
2012/13	2,165	3,286	29.87	22.02	69	77
2013/14	2,492	4,566	36.95	24.46	82	121
2014/15[a]	1,789	3,878	33.33	21.70	67	92

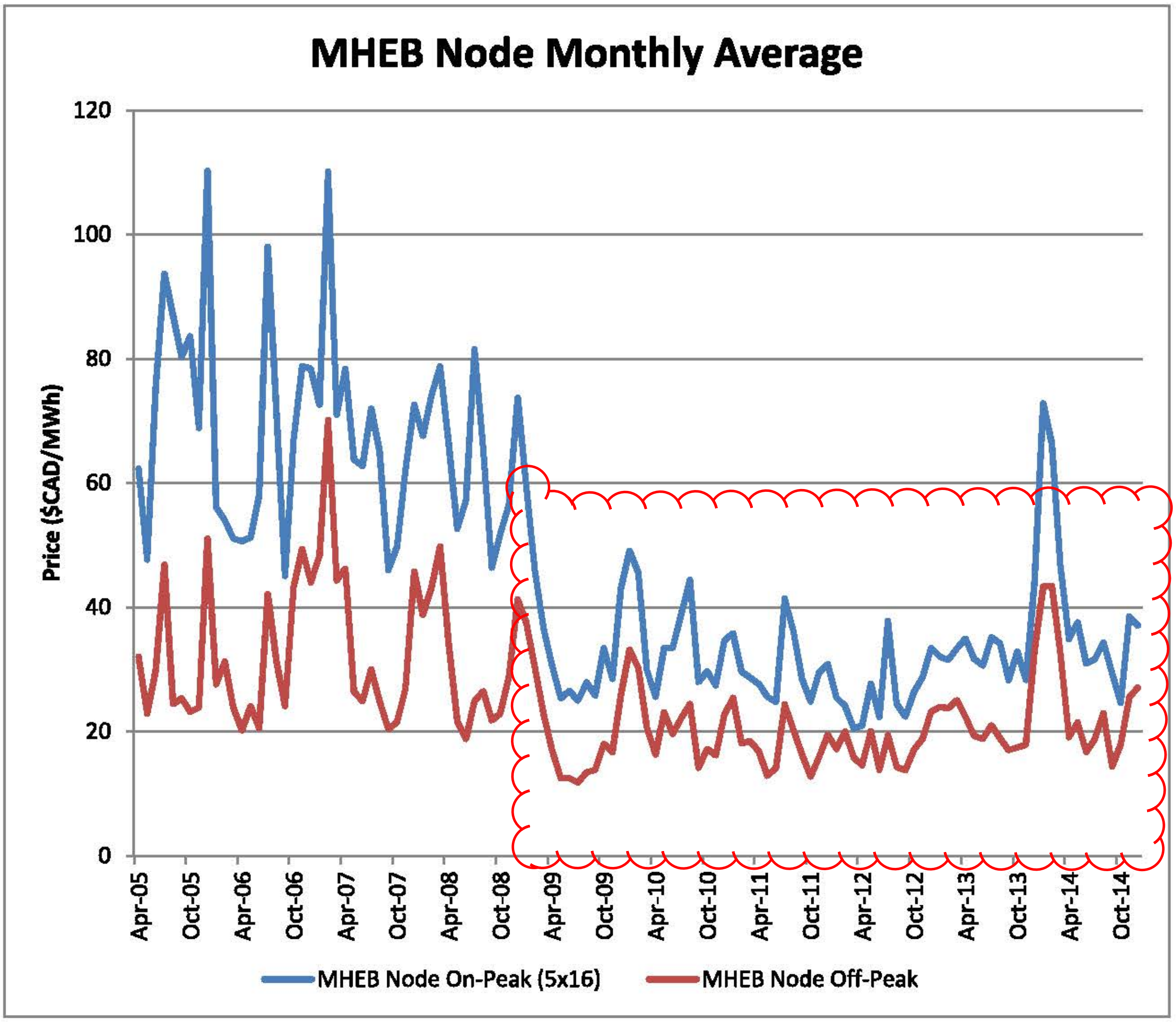
(a) Fiscal year through December 2014.

Figure 9.7 Opportunity Export Volumes



natural gas prices. In addition, modest load growth since 2009, the establishment of the MISO Ancillary Services Market, and the large scale development of new wind resources in North Dakota and Minnesota have also put downward pressure on energy prices. Figure 9.4 shows the history of monthly average on-peak (5 days × 16 hours) and off-peak (balance of hours) electricity prices for the MISO Manitoba Hydro Commercial Pricing Node.

Figure 9.4 Monthly Average On-Peak and Off-peak Prices at the MHEB Commercial Pricing Node



Manitoba Hydro continues to have good access to the U.S. market operated by the MISO. Access to the US will expand with the planned in-service of the new 500 kV transmission interconnection between Manitoba and Minnesota in 2020/21. Although demand for

Manitoba Hydro's electricity is strong in Saskatchewan, current access is limited. However, Manitoba Hydro and SaskPower are considering new transmission investments should a long-term power sale agreement come to fruition.

In recent years, market access to the Ontario market has been less favourable. Operated by the Independent Electricity System Operator (IESO), recent Ontario market rule changes and interpretations of those rules, in Manitoba Hydro's opinion, place external market participants at a disadvantage relative to generators located within Ontario, and negatively impacts competition overall. These developments have reduced Manitoba Hydro's incentive to participate in the IESO market. Market rules in Ontario continue to evolve, and are designed for the benefit of the load and local generation within the market. It is a continual challenge for Manitoba Hydro to maintain non-discriminatory access to Ontario.

From an overall perspective, open transmission access in the US and open energy markets have been very beneficial to Manitoba Hydro. Expanded access to the US and Saskatchewan will provide additional export opportunities, import capability and enhance Manitoba reliability.

Manitoba Hydro's recent average pricing experience of long-term dependable sales versus on-peak (5×16) opportunity sales is depicted in Figure 9.5. As most dependable sales are for on-peak energy, the price comparison to on-peak opportunity sales is appropriate. The prices shown for dependable sales include demand charges. In several years prior to the economic downturn of 2008-09, on-peak opportunity sales prices regularly exceeded dependable prices. However this changed abruptly in the spring of 2009 as load reduced and natural gas prices decreased.

Figure 9.5 Monthly Average On-Peak Pricing (Dependable vs. Opportunity)

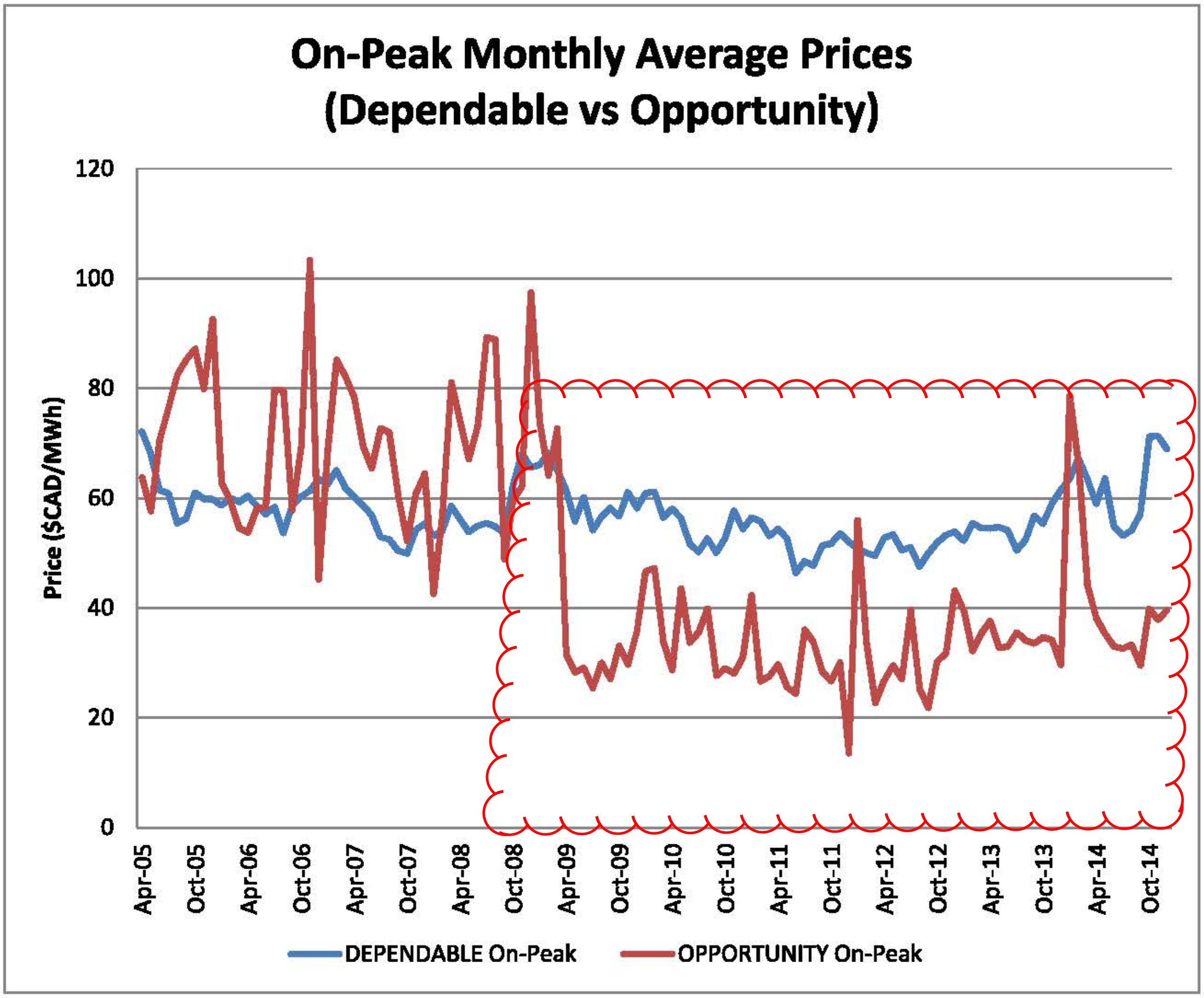


Figure 9.6 includes opportunity export volumes and average prices from the start of the MISO Day 2 Energy Market in April 2005 through December 2014. Figure 9.7 charts these opportunity export volumes for both on-peak (5×16) and off-peak periods, for the full fiscal years in this period. Opportunity export volumes are affected by water supply conditions, dependable export sales, and Manitoba load requirements. As a result, opportunity export volumes show significant variability year-to-year.

2

Section:	Tab 3: Appendix 3.7	Page No.:	1
Topic:	Integrated Financial Forecast & Economic Outlook		
Subtopic:	Interest Rate Forecast		
Issue:	Weighted Average Interest Rate		

PREAMBLE TO IR (IF ANY):

The majority of Manitoba Hydro's capital spending over the next five years will be debt-financed. Manitoba Hydro has provided interest rate forecasts with September and October 2014 vintages.

QUESTION:

Please update the forecast based on more current interest rate forecasts for both long and short term interest rates.

RATIONALE FOR QUESTION:

To gain an understanding of the financial exposure of the planned capital spending.

RESPONSE:

The January 2015 update to the interest rate forecast can be found in the response to PUB/MH-I-75c. The MH14 scenario incorporating this updated interest rate forecast is found as Attachment A.

It is important to recognize that this scenario would not occur in isolation of other economic outcomes that may affect the Corporation's financial performance and therefore the scenario in Appendix A is not a representative update to the Corporation's revenue requirement.

Manitoba Hydro operates in a complex economic environment that simultaneously affects many parts of its operations. The economy's impact upon Manitoba Hydro's revenue requirement is not exclusively seen through changing interest rates and the evolving views of Manitoba Hydro's external interest rate forecasters. There are numerous counterbalances.

For example, the low interest rate environment has provided an opportunity for Manitoba Hydro, on behalf of its ratepayers, to beneficially reduce its weighted average interest rate on its debt portfolio (please see PUB/MH-I-10a). However, at the same time that Manitoba Hydro experiences lower interest rates, the Corporation is also experiencing factors that are contributing to lower energy prices. One of the factors cited by the Bank of Canada for its January 21, 2015 action to lower the target overnight interest rate was the "unambiguously negative impact on the Canadian economy" of lower oil prices.

Natural gas prices are a significant factor driving electricity prices in the export market. There are numerous factors that underlie natural gas prices, such as oil and natural gas production growth, electricity demand growth and political events (related to OPEC). These factors are currently resulting in a continued commodity oversupply relative to demand, driving down natural gas prices which is then having a downward impact on the electricity export market. As a result, Manitoba Hydro expects that export revenue projections will be reduced from those provided for IFF14 largely offsetting the impact of lower interest rates on Manitoba Hydro's overall revenue requirements.

In order for the PUB to see a more representative and balanced outlook of Manitoba Hydro's electric operations, Manitoba Hydro has provided an additional MH14 scenario that shows the combined effects of updated interest rates along with estimated reductions in export revenue (see Attachment B). The following table demonstrates that the cumulative net income to 2016/17 is $6 million lower when simultaneously updated with both interest rates and extra-provincial revenues.

Fiscal Year	**MH14 Net Income** base case	**MH14 Net Income** Appendix A (Scenario updating interest rates only)	**MH14 Net Income** Appendix B (Scenario updating interest rates and extra-provincial revenues)
2014/15	102	102	102
2015/16	115	128	101
2016/17	59	89	67
TOTAL	**276**	**319**	**270**
Diff from Base		43	**(6)**

Manitoba Hydro periodically updates its financial projections to reflect a wide range of updated information. However, these updates need to be viewed in context with the underlying need for electricity rate increases. As discussed in Tab 2 of the Application, a large portion of the revenue requirements are associated with the magnitude of the capital assets being placed into service over the next forecast period. Manitoba Hydro's financial strength provides the means to smooth out short term volatility in costs and revenues to provide customers with rate stability. Isolating the impacts of changes, beneficial or adverse, in any one input variable has the potential to create a spurious forecast, and add undue rate variability and/or to alter the longer term progress towards the achievement of Manitoba Hydro's financial targets.

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
(In Millions of Dollars)

For the year ended March 31	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
REVENUES										
General Consumers										
at approved rates	1 437	1 454	1 460	1 483	1 490	1 501	1 506	1 513	1 525	1 538
additional*	0	57	118	183	250	321	394	471	554	641
BPIII Reserve Account	(30)	(32)	(34)	(36)	(11)	0	0	0	0	0
Extraprovincial	409	402	426	434	455	487	771	895	909	936
Other	15	14	14	14	15	15	15	15	16	16
	1 831	1 895	1 984	2 078	2 198	2 325	2 686	2 896	3 005	3 131
EXPENSES										
Operating and Administrative	486	542	552	557	571	585	601	607	619	631
Finance Expense	495	497	520	553	716	841	1 127	1 240	1 244	1 257
Depreciation and Amortization	405	401	422	445	521	524	612	665	735	751
Water Rentals and Assessments	124	123	112	112	112	114	124	127	132	133
Fuel and Power Purchased	134	125	187	197	202	200	227	252	249	258
Capital and Other Taxes	99	107	121	134	143	144	144	151	151	161
Corporate Allocation	9	8	8	8	8	8	8	8	8	8
Other Expenses	2	2	2	2	2	3	3	3	3	3
	1 754	1 806	1 924	2 011	2 277	2 420	2 846	3 052	3 141	3 201
Non-controlling Interest	25	12	7	7	5	3	7	0	(1)	(3)
Net Income	102	101	67	74	(73)	(92)	(153)	(156)	(137)	(73)
* Additional General Consumers Revenue										
Percent Increase	0.00%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%
Cumulative Percent Increase	0.00%	3.95%	8.06%	12.32%	16.76%	21.37%	26.17%	31.15%	36.33%	41.72%
Financial Ratios										
Equity	22%	18%	16%	15%	14%	13%	13%	11%	11%	11%
Interest Coverage	1.16	1.14	1.08	1.08	0.93	0.92	0.88	0.87	0.89	0.94
Capital Coverage	0.98	0.98	0.94	1.11	0.91	0.86	0.87	1.03	1.18	1.31

ATTACHMENT B - Updated Interest Rates and Net Extraprovincial Revenues

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
(In Millions of Dollars)

For the year ended March 31	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
REVENUES										
General Consumers										
at approved rates	1 551	1 565	1 580	1 593	1 607	1 624	1 641	1 659	1 677	1 696
additional*	734	832	935	1 043	1 157	1 280	1 409	1 486	1 566	1 649
BPIII Reserve Account	0	0	0	0	0	0	0	0	0	0
Extraprovincial	945	862	875	850	848	855	841	832	816	817
Other	16	17	17	18	18	18	19	19	19	20
	3 247	3 276	3 407	3 504	3 630	3 777	3 910	3 996	4 079	4 182
EXPENSES										
Operating and Administrative	644	657	669	683	697	706	719	733	748	763
Finance Expense	1 258	1 253	1 240	1 240	1 224	1 201	1 166	1 097	1 062	1 024
Depreciation and Amortization	766	779	790	803	810	819	830	841	855	871
Water Rentals and Assessments	133	133	133	134	134	135	135	136	136	137
Fuel and Power Purchased	268	266	273	274	281	291	296	305	309	320
Capital and Other Taxes	162	163	164	165	167	168	169	170	172	174
Corporate Allocation	8	8	8	8	8	6	5	6	5	5
Other Expenses	3	2	2	2	2	2	3	3	3	3
	3 242	3 260	3 281	3 308	3 322	3 328	3 323	3 291	3 291	3 298
Non-controlling Interest	(5)	(2)	(3)	(5)	(6)	(10)	(12)	(15)	(17)	(19)
Net Income	(0)	14	122	190	302	439	575	690	771	866
* Additional General Consumers Revenue										
Percent Increase	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	2.00%	2.00%	2.00%
Cumulative Percent Increase	47.31%	53.13%	59.18%	65.47%	72.01%	78.80%	85.86%	89.58%	93.37%	97.24%
Financial Ratios										
Equity	11%	11%	12%	12%	14%	16%	18%	21%	24%	28%
Interest Coverage	1.00	1.01	1.10	1.15	1.24	1.36	1.48	1.62	1.71	1.82
Capital Coverage	1.35	1.37	1.54	1.64	1.74	1.99	2.09	2.26	2.35	2.47

Manitoba Hydro
2014/15 2015/16 GRA
Comparison Analysis IFF14B (PUB/MH I-10b Att. B) vs. IFF14- Application

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	10 Years
Net Export Revenue											
IFF14b (PUB/MH I-10b (Attachment B)											
Export Revenues	409	402	426	434	455	487	771	895	909	936	**6,124**
Water Rentals	124	123	112	112	112	114	124	127	132	133	**1,213**
Fuel & Power Purchases	134	125	187	197	202	200	227	252	249	258	**2,031**
Net Export Revenue	**151**	**154**	**127**	**125**	**141**	**173**	**420**	**516**	**528**	**545**	**2,880**
IFF14											
Export Revenues	409	434	450	457	479	514	817	943	959	987	**6,449**
Water Rentals	124	123	112	112	112	114	124	127	132	132	**1,212**
Fuel & Power Purchases	134	130	191	202	207	205	234	263	257	267	**2,090**
Net Export Revenue	**151**	**181**	**147**	**143**	**160**	**195**	**459**	**553**	**570**	**588**	**3,147**
Net Export Revenue Difference	**-**	**(27)**	**(20)**	**(18)**	**(19)**	**(22)**	**(39)**	**(37)**	**(42)**	**(43)**	**(267)**
Finance Expense											
IFF14B (PUB/MH I-10b Att B)	495	497	520	553	716	841	1,127	1,240	1,244	1,257	**8,490**
IFF14	495	510	548	581	752	887	1,194	1,326	1,334	1,349	**8,976**
Difference	-	(13)	(28)	(28)	(36)	(46)	(67)	(86)	(90)	(92)	(486)
Net Income											
IFF14B(PUB/MH I-10b Att B)	102	101	67	74	(73)	(92)	(153)	(156)	(137)	(73)	**(340)**
IFF14	102	115	59	64	(90)	(116)	(178)	(206)	(187)	(124)	**(561)**
Difference	-	(14)	8	10	17	24	25	50	50	51	221

Sources
PUB/MH-I-10b, Attachment B
Appendix 3.3 (IFF14)

Cumulative Losses	
IFF14b (PUB/MH I-10b Att B)	(684)
IFF14 - Application	(978)
Difference	**294**

Analysis IFF14 vs IFF14a & IFF14b.xlsx, IFF 14b vs 14

Manitoba Hydro
2014/15 2015/16 GRA
Comparison Analysis IFF14B (PUB/MH I-10b Att. B) vs. IFF14- Application

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	20 Years
Net Export Revenue											
IFF14b (PUB/MH I-10b (Attachme											
Export Revenues	945	862	875	850	848	855	841	832	816	817	**14,665**
Water Rentals	133	133	133	134	134	135	135	136	136	137	**2,559**
Fuel & Power Purchases	268	266	273	274	281	291	296	305	309	320	**4,914**
Net Export Revenue	**544**	**463**	**469**	**442**	**433**	**429**	**410**	**391**	**371**	**360**	**7,192**
IFF14											
Export Revenues	996	928	944	921	920	927	911	901	883	884	**15,664**
Water Rentals	133	133	133	133	134	134	135	135	136	137	**2,555**
Fuel & Power Purchases	278	275	283	283	291	302	307	317	320	333	**5,079**
Net Export Revenue	**585**	**520**	**528**	**505**	**495**	**491**	**469**	**449**	**427**	**414**	**8,030**
Net Export Revenue Difference	**(41)**	**(57)**	**(59)**	**(63)**	**(62)**	**(62)**	**(59)**	**(58)**	**(56)**	**(54)**	**(838)**
Finance Expense											
IFF14B (PUB/MH I-10b Att B)	1,258	1,253	1,240	1,240	1,224	1,201	1,166	1,097	1,062	1,024	**20,255**
IFF14	1,351	1,348	1,338	1,337	1,321	1,301	1,263	1,197	1,161	1,116	**21,709**
Difference	(93)	(95)	(98)	(97)	(97)	(100)	(97)	(100)	(99)	(92)	(1,454)
Net Income											
IFF14B(PUB/MH I-10b Att B)	-	14	122	190	302	439	575	690	771	866	**3,629**
IFF14	(53)	(24)	84	155	266	400	536	647	725	826	**3,001**
Difference	53	38	38	35	36	39	39	43	46	40	628

Sources
PUB/MH-I-10b, Attachment B
Appendix 3.3 (IFF14)

Section:	4	Page No.:	Coalition I-12c, PUB/MH I-10b Attachment b, PUB/MH I-75c
Topic:	Integrated Financial Forecast and Economic Outlook		
Subtopic:	Export Revenue		
Issue:	Changes in Economic Variables impact on IFF		

PREAMBLE TO IR (IF ANY):

QUESTION:

a) Please provide a graphical comparison of net export revenue based on IFF14 with PUB/MH I-10b Attachment b. Provide a schedule including the yearly comparison similar to that provided in PUB/MH I-5c.

b) Please update PUB/MH I-5c to include the new plot of gross and net export revenue based on PUB/MH I-10b attachment B.

c) Please provide a table of supporting data points for part (b).

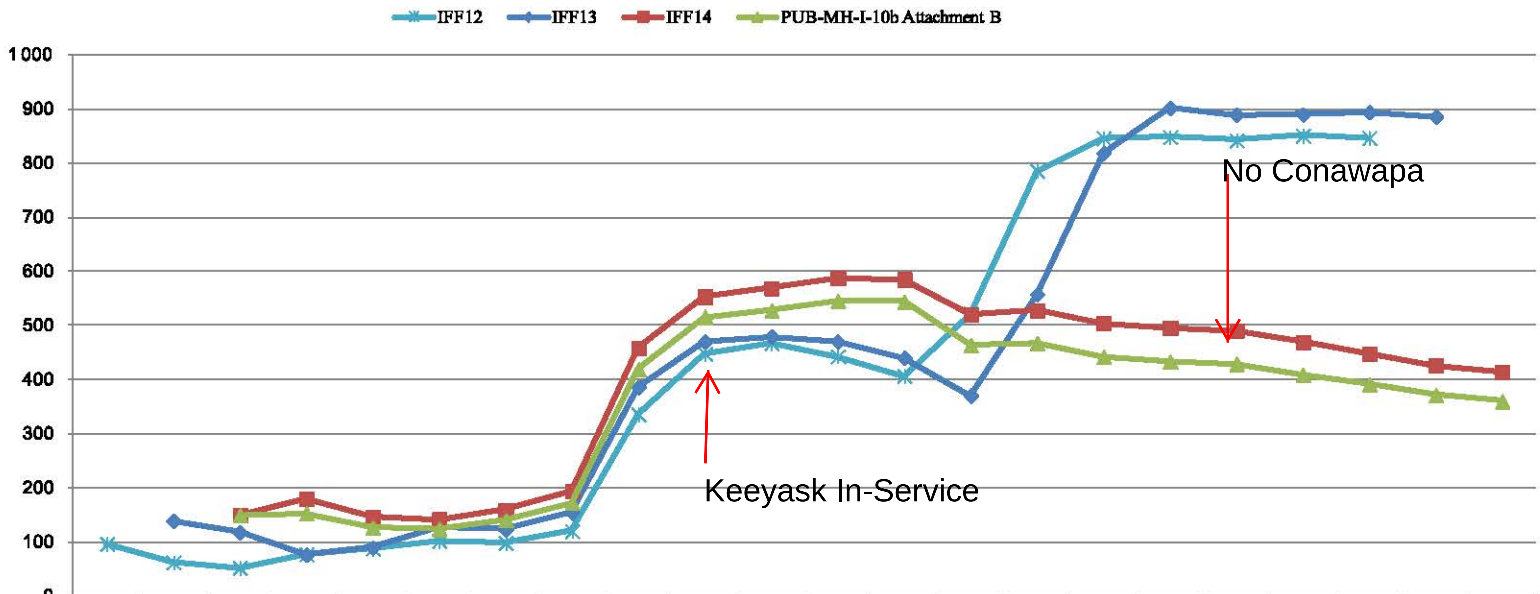
RATIONALE FOR QUESTION:

To assess changes in forecast assumptions.

RESPONSE:

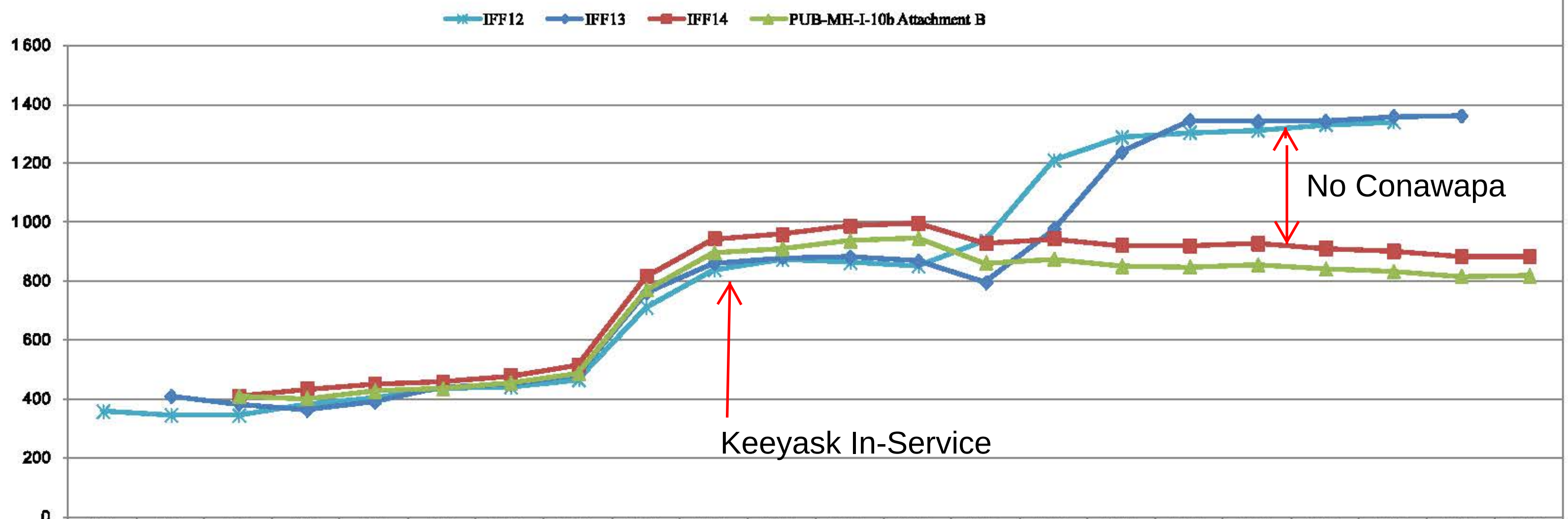
Please see the graphical comparisons of net export revenue and gross extraprovincial revenue between the scenario in PUB/MH-I-10b Attachment B with IFF14, IFF13 and IFF12. A schedule including the yearly comparison similar to that provided in PUB/MH-I-5c is also included below.

Net Extraprovincial Revenue



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
IFF12	97	62	53	78	88	102	99	121	336	448	468	443	407	522	786	846	848	843	851	847		
IFF13		139	118	77	90	127	124	155	386	471	480	471	441	371	558	819	902	890	890	894	886	
IFF14			150	181	147	142	160	195	459	554	569	588	586	521	528	505	496	491	469	449	427	414
PUB-MH-I-10b Attachment B			150	153	127	124	141	173	419	516	528	546	544	464	468	443	433	429	409	391	372	360

Gross Extraprovincial Revenue



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
IFF12	357	344	343	380	406	435	441	464	711	839	873	863	851	937	1 209	1 288	1 304	1 312	1 331	1 341		
IFF13		408	383	362	390	441	448	484	760	862	880	881	867	795	976	1 238	1 344	1 342	1 342	1 358	1 360	
IFF14			409	434	450	457	479	514	817	943	959	987	996	928	944	921	920	927	911	901	883	884
PUB-MH-I-10b Attachment B			409	402	426	434	455	487	771	895	909	936	945	862	875	850	848	855	841	832	816	817

Gross Extraprovincial Revenue

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
IFF14	409	434	450	457	479	514	817	943	959	987	996	928	944	921	920	927	911	901	883	884
PUB-MH-I-10b Attachment B	409	402	426	434	455	487	771	895	909	936	945	862	875	850	848	855	841	832	816	817
Annual Change	0	33	24	23	24	27	46	48	49	51	51	66	69	72	72	72	70	69	67	66
Cumulative Change	0	33	56	79	103	130	176	224	273	324	375	441	510	582	654	726	796	865	932	998

Net Extraprovincial Revenue

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
IFF14	150	181	147	142	160	195	459	554	569	588	586	521	528	505	496	491	469	449	427	414
PUB-MH-I-10b Attachment B	150	153	127	124	141	173	419	516	528	546	544	464	468	443	433	429	409	391	372	360
Annual Change	0	28	19	18	19	22	39	37	41	42	41	57	60	62	62	62	60	58	55	54
Cumulative Change	0	28	47	65	84	106	145	182	223	266	307	364	424	486	548	610	670	727	783	837

3

IFF Forecasts of Revenues/MWH

Price/Volume Components for Unit Revenues for Total Export Sales
(Nominal Canadian Dollars/MWh)

IFF-09 to IFF-10														
Total Export Sales	**2012/2013**	**2013/2014**	**2014/2015**	**2015/2016**	**2016/2017**	**2017/2018**	**2018/2019**	**2019/2020**						
IFF 09 ($/MW.h)	66.9	71.7	74.0	90.9	92.3	95.0	105.3	105.6						
IFF 10 ($/MW.h)	58.7	62.0	66.8	81.1	86.4	91.1	95.6	108.4						
% Total Change	-12%	14%	-10%	-11%	-6%	-4%	-9%	3%						
Total Change ($/MW.h)	-8.3	-9.7	-7.2	-9.7	-6.0	-3.9	-9.7	2.8						
Change due to Price ($/MW.h)	-9.8	-11.4	-9.1	-12.7	-12.7	-13.9	-12.7	-9.9						
Change due to Volume ($/MW.h)	2.4	2.6	3.0	3.6	3.8	7.0	-0.7	9.5						
Change due to Other ($/MW.h)	-0.8	-1.0	-1.2	-0.7	2.9	3.0	3.7	3.3						
IFF-10 to IFF-11														
Total Export Sales	**2012/2013**	**2013/2014**	**2014/2015**	**2015/2016**	**2016/2017**	**2017/2018**	**2018/2019**	**2019/2020**	**2020/2021**					
IFF 10 ($/MW.h)		62.0	66.8	81.1	86.4	91.1	95.6	108.4	111.2					
IFF 11 ($/MW.h)		42.5	50.4	61.9	68.8	75.3	81.1	88.1	94.3					
% Total Change		-31%	-24%	-24%	-20%	-17%	-15%	-19%	-15%					
Total Change ($/MW.h)		-19.5	-16.3	-19.3	-17.6	-15.7	-14.5	-20.3	-16.9					
Change due to Price ($/MW.h)		-16.4	-13.9	-15.2	-12.8	-10.7	-9.1	-7.6	-7.5					
Change due to Volume ($/MW.h)		-1.1	-2.1	-4.0	-4.8	-5.0	-5.5	-12.7	-9.5					
Change due to Other ($/MW.h)		-2.0	-0.3	-0.1	0.0	0.0	0.1	0.0	0.2					
IFF-11 to IFF-12														
Total Export Sales	**2012/2013**	**2013/2014**	**2014/2015**	**2015/2016**	**2016/2017**	**2017/2018**	**2018/2019**	**2019/2020**	**2020/2021**	**2021/2022**	**2022/2023**	**2023/2024**	**2024/2025**	**2025/2026**
IFF 11 ($/MW.h)			50.4	61.9	68.8	75.3	81.1	88.1	94.3	96.4	99.8	102.5	110.6	106.3
IFF 12 ($/MW.h)			41.4	48.1	52.4	57.2	61.8	66.5	76.5	82.0	85.6	89.6	93.2	90.6
% Total Change			-18%	-22%	-24%	-24%	-24%	-25%	-19%	-15%	-14%	13%	-16%	-15%
Total Change ($/MW.h)			-9.1	-13.7	-16.4	-18.1	-19.4	-21.6	-17.8	-14.5	-14.2	-12.9	-17.4	-15.8
Change due to Price ($/MW.h)			-6.6	-10.5	-12.0	-13.1	-13.8	-14.6	-13.6	-11.3	-10.6	-9.1	-11.0	-11.2
Change due to Volume ($/MW.h)			-1.7	-2.2	-2.4	-2.9	-3.1	-4.3	-2.5	-1.6	-1.9	-1.9	-4.0	-2.4
Change due to Other ($/MW.h)			-0.8	-1.0	-2.0	-2.1	-2.5	-2.7	-1.8	-1.6	-1.6	-1.9	-2.4	-2.2
IFF-12 to NFAT														
Total Export Sales	**2012/2013**	**2013/2014**	**2014/2015**	**2015/2016**	**2016/2017**	**2017/2018**	**2018/2019**	**2019/2020**	**2020/2021**	**2021/2022**	**2022/2023**	**2023/2024**	**2024/2025**	**2025/2026**
IFF 12 ($/MW.h)			41.4	48.1	52.4	57.2	61.8	66.5	76.5	82.0	85.6	89.6	93.2	90.6
NFAT ($/MW.h)			40.3	46.7	49.8	53.0	55.5	59.2	72.0	77.9	80.5	82.4	84.8	80.8
% Total Change			-3%	-3%	-5%	-7%	-10%	-11%	-6%	-5%	-6%	-8%	-9%	-11%
Total Change ($/MW.h)			-1.1	-1.4	-2.6	-4.2	-6.3	-7.4	-4.5	-4.0	-5.2	-7.2	-8.4	-9.8
Change due to Price ($/MW.h)			-2.1	-3.5	-5.0	-6.6	-9.1	-11.0	-5.8	-4.3	-5.2	-7.2	-8.2	-9.4
Change due to Volume ($/MW.h)			0.5	1.4	1.7	1.6	2.0	2.5	0.3	-0.6	-0.8	-0.9	-1.2	-1.1
Change due to Other ($/MW.h)			0.5	0.6	0.7	0.8	0.8	1.2	1.0	0.8	-0.8	0.9	1.0	0.7

Source: PUB/MH I-058

Source: PUB/MH I-058b NFAT

ACTUAL AVERAGE PRICE CALCULATION

VOLUMES (In GW.h)	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Firm Export Sales to Canada	0	0	0	0	0	0
Opportunity Export Sales to Canada	417	373	905	887	760	722
Total Export Sales to Canada	**417**	**373**	**905**	**887**	**760**	**722**
Firm Export Sales to USA	4087	3263	3377	3742	3636	3479
Opportunity Export Sales to USA	5622	7224	6062	5615	4691	6336
Total Export Sales to USA	**9709**	**10487**	**9439**	**9357**	**8327**	**9815**
Purchased Energy	**981**	**1320**	**1154**	**1634**	**1583**	**1823**
REVENUE/COST (In millions of dollars)						
Firm Export Revenues to Canada	0.000	0.000	0.000	0.000	0.000	0.000
Opportunity Export Revenues to Canada	45.389	40.971	35.728	34.416	33.475	20.352
Total Export Revenues to Canada	**45.389**	**40.971**	**35.728**	**34.416**	**33.475**	**20.352**
Firm Export Revenues to USA	233.457	185.966	172.362	174.870	177.049	181.674
Opportunity Export Revenues to USA	236.298	155.346	145.276	117.455	112.744	182.353
Total Export Revenues to USA	**469.755**	**341.312**	**317.638**	**292.325**	**289.793**	**364.027**
Total Export Sales to USA (includes net Trans & Enviro charges)	**491.283**	**324.289**	**296.831**	**270.903**	**265.331**	**339.392**
Total Import Energy	**56.309**	**32.074**	**34.676**	**78.079**	**70.897**	**98.031**
AVERAGE PRICE ($/MW.h))						
Firm Export Sales to Canada	0	0.00	0.00	0.00	0.00	0.00
Opportunity Export Sales to Canada	49.46	33.99	27.76	29.65	36.70	40.11
Total Export Sales to Canada	**49.46**	**33.99**	**27.76**	**29.65**	**36.70**	**40.11**
Firm Export Sales to USA	57.12	56.99	51.09	46.79	48.69	52.22
Opportunity Export Sales to USA	43.24	22.28	24.44	21.13	23.55	27.63
Total Export Sales to USA	**48.83**	**32.95**	**33.71**	**31.23**	**34.48**	**36.46**
Total Export Sales	**48.85**	**32.99**	**33.31**	**31.10**	**34.64**	**36.71**
Import Energy Including Wind	**50.75**	**31.58**	**36.71**	**47.33**	**51.98**	**58.92**

AVERAGE UNIT REVENUE/COST CALCULATION IFF14

FORECAST ->

VOLUMES (in GW.h)	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Demand:																				
Manitoba Domestic Energy Sales	22214	22456	22458	22861	23009	23250	23316	23458	23664	23868	24099	24336	24572	24807	25041	25325	25817	25917	26228	26546
Domestic energy Losses	3108	3297	3264	3302	2987	3013	2982	2919	2947	2976	3007	3040	3072	3107	3140	3178	3219	3260	3302	3346
Firm & Opportunity Export Sales to Canada	651	481	880	833	856	670	753	744	602	583	585	489	471	513	502	491	519	513	495	485
Firm & Opportunity Export Sales to US	9184	8596	6444	6192	6143	6289	9464	10232	10207	10017	9769	9462	9410	8960	8780	8559	8200	7870	7501	7258
Net Transmission Losses	958	933	885	632	630	648	927	991	970	949	919	884	877	840	819	793	764	727	692	664
Total Demand Volumes:	**36315**	**35764**	**33691**	**33841**	**33624**	**34071**	**37444**	**38345**	**38389**	**38394**	**38379**	**38211**	**38401**	**38227**	**38281**	**38347**	**38319**	**38287**	**38217**	**38297**
Supply:																				
MH Hydraulic Generation	35116	34418	31084	31129	30907	31456	34535	35275	35251	35253	35138	35078	35243	35141	35144	35146	35224	35125	35133	35157
MH Thermal Generation	101	121	326	349	350	298	151	142	147	140	148	146	155	122	118	120	108	107	106	108
Purchased Energy	1098	1226	2281	2363	2367	2316	2758	2927	2991	3000	3094	2984	3004	2964	3019	3082	2987	3056	2979	3031
Total Supply Volumes:	**36315**	**35764**	**33691**	**33841**	**33624**	**34071**	**37444**	**38345**	**38389**	**38393**	**38379**	**38211**	**38401**	**38227**	**38281**	**38347**	**38319**	**38287**	**38217**	**38297**

REVENUE/COST (in millions of dollars)	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Total Manitoba Domestic Energy Sales:																				
Manitoba Domestic Energy Sales @ Approved Rates	1 436.742	1 464.388	1 460.247	1 482.604	1 490.283	1 501.465	1 505.896	1 513.421	1 525.486	1 537.643	1 551.384	1 565.461	1 579.532	1 593.283	1 607.122	1 623.939	1 641.157	1 658.777	1 677.031	1 696.791
Additional Domestic Revenue	0.000	57.448	117.638	182.720	249.787	320.910	394.053	471.445	554.231	641.409	734.027	831.780	934.799	1 043.117	1 157.220	1 279.863	1 409.139	1 485.929	1 565.867	1 648.967
Manitoba Domestic Sales	**1 436.742**	**1 511.836**	**1 577.885**	**1 665.324**	**1 740.070**	**1 822.375**	**1 899.949**	**1 984.866**	**2 079.717**	**2 178.952**	**2 285.411**	**2 397.241**	**2 514.331**	**2 636.400**	**2 764.342**	**2 903.802**	**3 050.296**	**3 144.706**	**3 242.898**	**3 344.758**
Extraprovincial Revenue:																				
Total Export Sales to Canada	28.748	16.104	43.626	43.531	47.304	51.022	46.615	48.502	36.226	37.180	37.246	32.888	32.290	37.764	37.507	37.947	41.842	42.826	42.202	42.644
Total Export Sales to USA	343.003	380.033	379.506	386.312	403.741	435.497	741.684	866.129	892.952	920.218	928.219	864.490	879.933	851.215	849.642	855.646	835.028	823.503	805.418	804.815
Other Non-Energy Related Revenues	19.698	15.880	2.765	2.820	2.876	2.934	2.990	3.046	3.104	3.163	3.223	3.285	3.347	3.411	3.475	3.542	3.609	3.677	3.747	3.818
Transmission Credits	17.443	22.140	23.841	24.294	24.755	24.824	25.296	25.776	26.266	26.765	27.274	27.792	28.320	28.858	29.406	29.965	30.534	31.114	31.706	32.308
Extraprovincial Revenue	**408.892**	**434.157**	**449.739**	**456.958**	**478.677**	**514.277**	**816.584**	**943.464**	**958.548**	**987.327**	**995.962**	**928.454**	**943.890**	**921.247**	**920.031**	**927.099**	**911.013**	**901.120**	**883.073**	**883.586**
Water Rentals & Assessments:																				
MH Water Rentals	117.417	115.049	103.902	104.051	103.310	105.144	115.437	117.912	117.830	117.838	117.451	117.252	117.802	117.462	117.474	117.479	117.738	117.408	117.434	117.516
Assessments	4.934	5.683	6.165	6.329	6.499	6.567	6.742	6.923	7.108	7.300	7.496	7.696	7.903	8.115	8.334	8.558	8.789	9.026	9.269	9.521
Other Costs	2.118	2.115	2.100	2.118	2.137	2.154	2.172	2.190	6.870	7.330	7.595	7.458	7.654	7.858	8.083	8.362	8.715	8.991	9.368	9.765
Water Rentals & Assessments:	**124.469**	**122.847**	**112.167**	**112.499**	**111.946**	**113.866**	**124.351**	**127.024**	**131.808**	**132.467**	**132.541**	**132.407**	**133.359**	**133.436**	**133.841**	**134.399**	**135.243**	**135.426**	**136.071**	**136.802**
Fuel & Power Purchased:																				
MH Thermal Generation	6.179	6.582	19.875	22.437	23.634	21.194	12.914	12.716	13.672	13.493	14.642	15.258	16.653	13.745	13.878	14.658	13.923	14.300	14.763	15.729
Purchased Energy	70.910	73.771	114.268	120.552	123.099	123.490	140.962	153.485	159.405	168.054	176.726	171.822	177.022	179.097	185.295	194.239	194.241	202.792	204.118	214.221
Other Non-Energy related Costs	14.142	12.663	8.777	9.148	9.453	9.568	12.076	29.249	16.313	16.730	17.215	17.686	18.198	18.556	19.048	19.579	20.064	20.610	21.174	21.773
Transmission Charges	42.958	37.416	48.013	50.034	50.985	51.131	67.564	67.344	67.969	68.612	69.275	70.213	70.914	71.636	72.378	73.141	78.423	79.229	80.057	80.908
Fuel & Power Purchased	**134.189**	**130.432**	**190.933**	**202.172**	**207.171**	**205.383**	**233.516**	**262.795**	**257.359**	**266.889**	**277.858**	**274.979**	**282.788**	**283.033**	**290.599**	**301.616**	**306.651**	**316.932**	**320.113**	**332.631**

AVERAGE UNIT REVENUE/COST ($/MW.h))	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Manitoba Domestic Energy Sales @ Approved Rates	$ 64.68	$ 64.76	$ 65.02	$ 64.80	$ 64.77	$ 64.58	$ 64.56	$ 64.52	$ 64.47	$ 64.42	$ 64.36	$ 64.33	$ 64.28	$ 64.23	$ 64.18	$ 64.12	$ 64.07	$ 64.00	$ 63.94	$ 63.88
Additional Domestic Revenue	-	2.56	5.24	7.99	10.86	13.80	16.90	20.10	23.42	26.87	30.46	34.18	38.04	42.05	46.21	50.53	55.01	57.33	59.71	62.12
Total Manitoba Domestic Energy Sales @ meter	64.68	67.32	70.26	72.78	75.62	78.38	81.46	84.61	87.89	91.29	94.83	98.51	102.32	106.28	110.39	114.65	119.07	121.34	123.65	126.00
Total Export Sales to Canada	35.86	41.32	66.73	68.67	61.86	66.44	70.39	74.22	70.89	75.63	78.63	82.67	85.02	89.47	91.24	94.72	97.80	101.37	104.39	108.31
Total Export Sales to USA (includes Net Trans Credits)	34.57	42.44	55.14	58.23	61.46	65.08	73.90	80.58	83.40	87.86	90.53	88.88	86.98	90.23	91.87	94.82	96.00	98.52	100.82	104.20
Total Export Sales	34.67	42.39	55.31	58.28	61.60	65.11	73.67	80.20	82.80	87.12	89.98	86.71	86.83	90.19	91.84	94.91	96.09	98.66	101.10	104.41
MH Hydraulic Generation (Water Rentals)	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	61.39	54.56	61.03	64.31	67.54	71.04	85.53	89.55	92.72	96.07	99.18	103.09	107.44	112.66	117.70	122.43	129.03	134.10	138.75	145.03
Purchased Energy (including Assessments)	69.06	64.81	52.79	53.70	54.76	56.15	53.55	54.80	55.67	58.46	59.54	60.15	61.57	63.15	64.14	65.81	67.96	69.31	71.64	73.81

Includes Keeyask - No Conawapa

AVERAGE UNIT REVENUE/COST CALCULATION IFF13

VOLUMES (in GW.h)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33
Demand:																				
Manitoba Domestic Energy Sales	21994	22305	22557	22783	22988	23292	23603	23912	24238	24560	24893	25235	25576	25910	26243	26616	26986	27351	27709	28067
Domestic energy Losses	3198	3237	3122	3140	2831	2874	2901	2900	2929	2994	3045	3115	3184	3222	3342	3381	3448	3489	3544	3595
Firm & Opportunity Export Sales to Canada	690	765	580	586	597	588	583	448	449	444	448	427	435	402	587	780	761	778	771	760
Firm & Opportunity Export Sales to US	9998	8921	6583	6437	6600	6192	6315	9210	9831	9663	9266	8855	8374	9807	12273	12947	12555	12256	12044	11720
Net Transmission Losses	925	913	648	628	640	593	606	868	920	901	881	807	761	926	1206	1277	1233	1210	1163	1147
Total Demand Volumes:	36805	36140	33490	33574	33656	33538	34007	37338	38365	38561	38532	38439	38330	40267	43652	45001	44983	45096	45251	45289
Supply:																				
MH Hydraulic Generation	35143	34321	30910	30876	30854	30612	31146	34298	35124	35266	35208	34906	34852	37263	40974	42011	41934	42142	42213	42210
MH Thermal Generation	114	132	348	350	357	372	333	230	233	236	228	256	228	249	223	229	229	210	213	210
Purchased Energy	1548	1687	2232	2348	2444	2555	2529	2810	3008	3059	3096	3276	3250	2755	2456	2761	2820	2744	2825	2869
Total Supply Volumes:	36805	36140	33490	33574	33656	33538	34007	37338	38365	38561	38532	38439	38330	40267	43652	45001	44983	45096	45251	45289

REVENUE/COST (in millions of dollars)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33
Total Manitoba Domestic Energy Sales:																				
Manitoba Domestic Energy Sales @ Approved Rates	1 396.088	1 407.672	1 423.207	1 438.093	1 452.299	1 470.697	1 489.539	1 508.397	1 527.644	1 547.533	1 567.628	1 588.388	1 609.069	1 629.119	1 649.283	1 671.588	1 693.740	1 715.486	1 736.903	1 758.320
Additional Domestic Revenue	0.000	55.603	114.654	177.234	243.420	314.334	389.773	469.880	555.015	645.577	741.712	843.962	952.279	1 066.579	1 187.578	1 317.211	1 454.288	1 598.904	1 751.418	1 912.502
Manitoba Domestic Sales	1 396.088	1 463.275	1 537.861	1 615.327	1 695.719	1 785.031	1 879.312	1 978.277	2 082.659	2 193.110	2 309.340	2 432.350	2 561.348	2 695.698	2 836.861	2 988.799	3 148.028	3 314.390	3 488.321	3 670.822
Extraprovincial Revenue:																				
Total Export Sales to Canada	24.182	23.524	19.281	22.107	25.464	27.799	29.371	22.785	24.158	24.914	26.918	26.325	28.023	25.746	40.709	57.274	58.127	62.156	63.938	65.628
Total Export Sales to USA	350.452	329.129	320.587	345.425	392.816	396.894	430.767	712.902	812.871	829.979	828.623	814.539	740.286	923.100	1 168.842	1 258.488	1 254.391	1 249.818	1 264.261	1 263.869
Other Non-Energy Related Revenues	15.587	11.423	2.416	2.461	2.550	2.599	2.648	2.698	2.750	2.802	2.855	2.909	2.965	3.021	3.078	3.137	3.196	3.257	3.319	3.382
Transmission Credits	18.206	18.834	19.290	19.754	20.568	21.000	21.399	21.805	22.220	22.642	23.072	23.510	23.957	24.412	24.876	25.349	25.830	26.321	26.821	27.331
Extraprovincial Revenue	408.426	382.910	361.574	389.747	441.398	448.292	484.186	760.191	861.999	880.336	881.468	867.284	796.231	976.280	1 237.506	1 344.248	1 341.544	1 341.552	1 358.339	1 360.210
Water Rentals & Assessments:																				
MH Water Rentals	117.480	114.725	103.321	103.204	103.132	102.323	104.108	114.646	117.407	117.875	117.687	116.672	116.496	124.556	136.958	140.427	140.168	140.862	141.100	141.092
Assessments	5.207	5.543	5.721	5.900	6.188	6.365	6.535	6.708	6.886	7.069	7.258	7.451	7.649	7.853	8.063	8.278	8.499	8.727	8.960	9.200
Other Costs	2.213	2.266	2.239	2.258	2.277	2.297	2.317	2.338	2.359	2.380	2.402	2.425	2.447	2.470	2.494	2.518	2.543	2.568	2.593	2.619
Water Rentals & Assessments:	124.900	122.534	111.281	111.362	111.598	110.986	112.960	123.691	126.652	127.325	127.347	126.548	126.592	134.880	147.516	151.224	151.210	152.157	152.653	152.911
Fuel & Power Purchased:																				
MH Thermal Generation	6.495	8.221	21.990	23.134	25.270	27.652	26.887	21.095	22.250	23.527	23.565	27.130	25.545	28.939	27.230	29.230	30.467	29.450	31.036	31.789
Purchased Energy	81.197	82.788	103.001	110.745	119.348	126.894	129.239	140.533	154.137	161.424	171.888	184.913	183.786	165.823	154.233	172.355	180.289	179.185	189.121	197.346
Other Non-Energy related Costs	11.353	8.768	6.804	7.045	7.304	7.560	7.822	8.951	9.402	9.690	9.987	10.294	10.610	10.937	11.273	11.620	11.978	12.347	12.728	13.121
Transmission Charges	45.311	42.530	41.717	47.648	50.630	51.692	52.674	79.572	78.916	78.419	78.065	77.843	77.741	77.726	77.768	77.866	78.020	78.230	78.495	78.814
Fuel & Power Purchased	144.355	142.306	173.511	188.572	202.552	213.798	216.622	250.151	264.704	273.060	283.506	300.180	297.682	283.425	270.504	291.071	300.754	299.212	311.379	321.069

AVERAGE UNIT REVENUE/COST ($/MW.h))	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33
Manitoba Domestic Energy Sales @ Approved Rates	$ 63.48	$ 63.11	$ 63.09	$ 63.12	$ 63.18	$ 63.14	$ 63.11	$ 63.08	$ 63.03	$ 63.01	$ 62.96	$ 62.94	$ 62.91	$ 62.88	$ 62.85	$ 62.80	$ 62.78	$ 62.72	$ 62.68	$ 62.65
Additional Domestic Revenue	-	2.49	5.08	7.78	10.59	13.50	16.51	19.65	22.90	26.29	29.80	33.44	37.23	41.16	45.25	49.49	53.88	58.46	63.21	68.14
Total Manitoba Domestic Energy Sales @ meter	63.48	65.60	68.18	70.90	73.77	76.64	79.62	82.73	85.93	89.30	92.77	96.39	100.15	104.04	108.10	112.29	116.65	121.18	125.89	130.79
Total Export Sales to Canada	35.87	34.97	39.38	44.63	50.28	55.96	59.63	63.79	67.41	70.47	75.44	78.24	81.51	82.83	82.00	83.12	86.75	90.38	94.03	96.08
Total Export Sales to USA (Includes Net Trans Credits)	32.34	34.24	45.29	48.33	54.87	59.14	63.26	71.13	76.82	80.12	83.31	85.85	81.88	88.69	90.92	93.15	95.78	97.68	100.68	103.45
Total Export Sales	32.56	34.29	44.88	49.00	54.63	58.91	63.00	70.86	76.59	79.78	83.02	85.58	81.97	88.61	90.58	92.64	96.30	97.27	100.32	103.16
MH Hydraulic Generation (Water Rentals)	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	56.84	62.18	63.19	66.13	70.71	74.37	80.85	91.64	95.49	99.00	102.86	105.98	112.22	116.31	122.26	127.54	132.83	139.93	145.46	151.44
Purchased Energy (Including Assessments)	55.83	52.36	48.71	49.67	51.35	52.16	53.69	52.40	53.53	55.08	57.86	58.68	58.90	63.03	66.09	65.43	66.95	68.49	70.11	72.00

Includes Keeyask

Includes Conawapa

AVERAGE UNIT REVENUE/COST CALCULATION IFF12

VOLUMES (in GW.h)	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Demand:										
Manitoba Domestic Energy Sales	21748	22330	22547	22781	22987	23336	23720	23945	24333	24701
Domestic energy Losses	3400	3267	3197	3225	3225	2935	2991	3000	3033	3078
Firm & Opportunity Export Sales to Canada	756	830	646	633	633	613	605	612	477	493
Firm & Opportunity Export Sales to US	8690	8183	6521	6263	6063	5995	5599	5485	8032	8997
Export Transmission Losses	813	804	640	615	595	582	540	529	744	839
Total Demand Volumes:	**35407**	**35414**	**33551**	**33517**	**33503**	**33461**	**33455**	**33572**	**36620**	**38108**
Supply:										
MH Hydraulic Generation	32904	32232	30838	30823	30808	30659	30621	30872	33405	34827
MH Thermal Generation	85	84	320	337	332	369	364	228	211	226
Purchased Energy	2418	3098	2393	2357	2363	2433	2471	2472	3004	3055
Total Supply Volumes:	**35407**	**35414**	**33551**	**33517**	**33503**	**33461**	**33456**	**33572**	**36620**	**38108**

REVENUE/COST (in millions of dollars)	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Manitoba Domestic Energy Sales @ Approved Rates	1 320.902	1 360.887	1 373.679	1 389.710	1 403.712	1 424.295	1 446.831	1 461.817	1 484.567	1 506.294
Additional Domestic Revenue	0.000	47.631	104.238	164.514	228.182	296.933	370.695	447.070	530.603	619.132
Total Manitoba Domestic Energy Sales	1 320.902	1 408.518	1 477.917	1 554.224	1 631.894	1 721.228	1 817.526	1 908.887	2 015.170	2 125.426
Total Export Sales to Canada	28.318	20.902	22.169	24.667	27.638	29.167	31.446	34.780	28.690	31.558
Total Export Sales to USA (includes net Trans charges)	267.927	273.052	274.218	307.301	322.984	349.015	351.825	370.822	622.306	746.281
Total Export Sales	296.245	293.954	296.387	331.968	350.622	378.182	383.271	405.602	650.996	777.838
MH Hydraulic Generation	109.643	107.741	103.029	102.980	102.930	102.433	102.303	103.142	111.606	116.357
MH Thermal Generation	6.791	5.674	19.029	22.158	23.354	27.736	28.594	22.772	21.916	24.321
Purchased Energy	87.076	111.204	114.321	122.860	129.648	138.848	146.382	152.079	173.296	180.635

AVERAGE UNIT REVENUE/COST ($/MW.h))	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Manitoba Domestic Energy Sales @ Approved Rates	$ 60.74	$ 60.94	$ 60.93	$ 61.00	$ 61.07	$ 61.04	$ 61.00	$ 61.05	$ 61.01	$ 60.98
Additional Domestic Revenue	-	2.13	4.62	7.22	9.93	12.72	15.63	18.67	21.81	25.07
Total Manitoba Domestic Energy Sales @ meter	60.74	63.08	65.55	68.23	70.99	73.76	76.62	79.72	82.82	86.05
Total Export Sales to Canada	38.95	28.32	39.93	45.49	50.96	55.83	61.12	66.67	74.22	78.41
Total Export Sales to USA	30.83	33.37	42.05	49.06	53.27	58.22	62.84	67.61	77.47	82.95
Total Export Sales	31.36	32.61	41.36	48.14	52.36	57.23	61.78	66.52	76.50	81.96
MH Hydraulic Generation	$ 3.33	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	79.89	67.55	59.50	65.70	70.36	75.20	78.63	99.72	103.73	107.75
Purchased Energy	36.01	35.90	47.77	52.12	54.88	57.07	59.23	61.53	57.70	59.12

AVERAGE UNIT REVENUE/COST CALCULATION IFF12

VOLUMES (In GW.h)	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Demand:										
Manitoba Domestic Energy Sales	25078	25462	25854	26233	26605	27003	27415	27825	28232	28638
Domestic energy Losses	3134	3212	3284	3338	3423	3467	3525	3596	3657	3701
Firm & Opportunity Export Sales to Canada	464	474	455	459	670	835	813	797	798	789
Firm & Opportunity Export Sales to US	9014	8450	7991	9162	11836	12217	11913	11564	11351	11086
Export Transmission Losses	836	775	717	859	1157	1205	1169	1129	1106	1075
Total Demand Volumes:	**38526**	**38373**	**38300**	**40051**	**43692**	**44726**	**44835**	**44911**	**45144**	**45290**
Supply:										
MH Hydraulic Generation	35202	34928	34618	36887	40743	41662	41699	41697	41907	41990
MH Thermal Generation	236	233	263	240	214	197	201	201	196	198
Purchased Energy	3088	3212	3419	2924	2734	2868	2935	3013	3041	3102
Total Supply Volumes:	**38526**	**38373**	**38300**	**40051**	**43692**	**44726**	**44835**	**44911**	**45144**	**45290**
REVENUE/COST (in milions of dollars)										
Manitoba Domestic Energy Sales @ Approved Rates	1 528.519	1 551.628	1 575.365	1 598.077	1 620.507	1 644.110	1 668.561	1 692.913	1 716.960	1 741.059
Additional Domestic Revenue	713.461	814.144	921.476	1 034.808	1 154.791	1 282.832	1 419.244	1 563.705	1 716.381	1 877.992
Total Manitoba Domestic Energy Sales	2 241.980	2 365.772	2 496.841	2 632.885	2 775.298	2 926.942	3 087.805	3 256.618	3 433.341	3 619.051
Total Export Sales to Canada	30.160	33.542	33.613	35.964	53.476	68.490	69.683	71.331	74.627	76.505
Total Export Sales to USA (includes net Trans charges)	781.254	766.206	753.706	835.424	1 089.509	1 151.614	1 165.013	1 170.055	1 184.630	1 191.326
Total Export Sales	811.414	799.748	787.319	871.387	1 142.985	1 220.104	1 234.696	1 241.387	1 259.257	1 267.830
MH Hydraulic Generation	117.610	116.694	115.659	123.240	136.123	139.191	139.315	139.308	140.010	140.287
MH Thermal Generation	26.260	26.666	31.012	29.933	27.564	26.062	27.575	28.511	28.720	29.876
Purchased Energy	190.947	204.190	224.140	187.046	184.201	198.915	209.424	220.744	229.030	240.063
AVERAGE UNIT REVENUE/COST ($/MW.h))										
Manitoba Domestic Energy Sales @ Approved Rates	$ 60.95	$ 60.94	$ 60.93	$ 60.92	$ 60.91	$ 60.89	$ 60.86	$ 60.84	$ 60.82	$ 60.79
Additional Domestic Revenue	28.45	31.97	35.64	39.45	43.40	47.51	51.77	56.20	60.80	65.58
Total Manitoba Domestic Energy Sales @ meter	89.40	92.91	96.57	100.37	104.31	108.39	112.63	117.04	121.61	126.37
Total Export Sales to Canada	80.88	87.60	92.20	97.80	92.27	92.07	96.44	100.96	105.51	109.58
Total Export Sales to USA	86.67	90.68	94.32	91.18	92.05	94.26	97.80	101.18	104.36	107.46
Total Export Sales	85.61	89.62	93.22	90.57	91.39	93.48	97.02	100.42	103.65	106.76
MH Hydraulic Generation	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	111.27	114.58	118.08	124.72	128.53	132.60	136.94	141.59	146.26	151.03
Purchased Energy	61.83	63.57	65.55	63.97	67.36	69.35	71.36	73.27	75.32	77.38

AVERAGE PRICE CALCULATION: IFF11-2

VOLUMES (in GW.h)	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Demand:										
Manitoba Domestic Energy Sales	21147	21749	22261	22488	22523	22796	23173	23351	23728	24119
Domestic energy Losses	3496	3161	3181	3223	3237	3272	3022	3061	3100	3138
Firm & Opportunity Export Sales to Canada	804	915	589	577	603	595	581	570	537	471
Firm & Opportunity Export Sales to US	9440	6337	6537	6378	6257	6048	5853	5673	5845	7713
Export Transmission Losses	876	625	654	632	624	600	575	554	555	736
Total Demand Volumes:	**35763**	**32787**	**33222**	**33299**	**33244**	**33311**	**33204**	**33209**	**33767**	**36177**
Supply:										
MH Hydraulic Generation	33158	29268	30744	30712	30693	30699	30461	30375	30813	33223
MH Thermal Generation	77	111	311	328	314	332	385	430	295	307
Purchased Energy	2530	3497	2259	2350	2328	2371	2449	2495	2751	2738
Total Supply Volumes:	**35765**	**32876**	**33313**	**33390**	**33335**	**33402**	**33296**	**33300**	**33858**	**36268**

REVENUE/COST (in millions of dollars)	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Manitoba Domestic Energy Sales @ Approved Rates	1 186.223	1 290.384	1 293.566	1 306.475	1 313.103	1 329.744	1 349.664	1 361.356	1 381.890	1 402.571
Additional Domestic Revenue	0.000	45.260	105.523	156.033	208.272	264.834	325.447	387.404	455.377	527.459
Total Manitoba Domestic Energy Sales	1 186.223	1 335.644	1 399.089	1 462.508	1 521.375	1 594.578	1 675.111	1 748.760	1 837.267	1 930.030
Total Export Sales to Canada	30.020	33.720	25.704	30.824	37.390	41.398	44.821	47.780	48.654	46.621
Total Export Sales to USA	270.237	221.081	277.149	320.013	386.869	415.481	439.948	458.828	513.945	725.031
Total Export Sales	300.257	254.801	302.852	350.838	424.259	456.879	484.769	506.608	562.599	771.652
MH Hydraulic Generation	110.837	97.834	102.715	102.608	102.546	102.564	101.771	101.482	102.945	110.999
MH Thermal Generation	9.323	9.386	21.929	25.643	25.530	28.061	34.026	40.391	36.076	38.836
Purchased Energy	83.914	120.044	108.483	120.490	125.566	133.687	143.093	151.183	167.962	171.345

AVERAGE PRICE ($/MW.h))	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Manitoba Domestic Energy Sales @ Approved Rates	$ 56.10	$ 59.33	$ 58.11	$ 58.10	$ 58.30	$ 58.33	$ 58.24	$ 58.30	$ 58.24	$ 58.15
Additional Domestic Revenue	0.00	2.08	4.74	6.94	9.25	11.62	14.04	16.59	19.19	21.87
Total Manitoba Domestic Energy Sales @ meter	56.10	61.41	62.85	65.04	67.55	69.95	72.29	74.89	77.43	80.02
Total Export Sales to Canada	37.34	36.85	43.66	53.39	62.03	69.62	77.14	83.81	90.54	98.93
Total Export Sales to USA	28.63	34.89	42.40	50.17	61.83	68.70	75.17	80.88	87.92	94.00
Total Export Sales	29.31	35.14	42.50	50.44	61.85	68.76	75.34	81.14	88.14	94.29
MH Hydraulic Generation	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	121.08	84.56	70.61	78.22	81.42	84.54	88.28	93.81	122.44	126.61
Purchased Energy	33.17	34.33	48.03	51.26	53.93	56.37	58.43	60.59	61.06	62.58

AVERAGE PRICE CALCULATION: IFF11-2

VOLUMES (in GW.h)	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Demand:										
Manitoba Domestic Energy Sales	24468	24814	25161	25510	25865	26266	26648	27026	27392	27760
Domestic energy Losses	3166	3237	3302	3342	3487	3525	3579	3629	3688	3732
Firm & Opportunity Export Sales to Canada	559	555	538	386	553	689	663	651	632	633
Firm & Opportunity Export Sales to US	8396	8264	8188	9296	12179	12978	12692	12343	12048	11885
Export Transmission Losses	819	804	775	887	1194	1279	1242	1202	1167	1149
Total Demand Volumes:	**37409**	**37674**	**37964**	**39420**	**43277**	**44736**	**44823**	**44852**	**44927**	**45160**
Supply:										
MH Hydraulic Generation	34591	34813	34685	36500	40442	41715	41670	41637	41638	41837
MH Thermal Generation	298	305	324	299	251	262	278	275	276	276
Purchased Energy	2612	2647	3045	2712	2675	2850	2965	3031	3104	3139
Total Supply Volumes:	**37500**	**37765**	**38055**	**39511**	**43368**	**44827**	**44914**	**44943**	**45018**	**45251**

REVENUE/COST (in millions of dollars)	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Manitoba Domestic Energy Sales @ Approved Rates	1 421.635	1 440.557	1 459.652	1 478.804	1 498.358	1 520.624	1 541.314	1 561.748	1 581.673	1 601.558
Additional Domestic Revenue	603.097	682.933	767.293	822.484	879.993	941.345	1 004.062	1 068.956	1 135.879	1 205.194
Total Manitoba Domestic Energy Sales	2 024.732	2 123.490	2 226.945	2 301.288	2 378.351	2 461.969	2 545.376	2 630.704	2 717.552	2 806.752
Total Export Sales to Canada	54.997	57.003	57.101	47.325	62.910	76.069	75.887	77.396	77.846	80.783
Total Export Sales to USA	808.434	822.968	837.452	1 023.828	1 290.968	1 394.691	1 411.875	1 404.792	1 408.400	1 424.775
Total Export Sales	863.431	879.971	894.552	1 071.153	1 353.878	1 470.761	1 487.762	1 482.188	1 486.246	1 505.557
MH Hydraulic Generation	115.572	116.313	115.886	121.946	135.118	139.370	139.220	139.108	139.113	139.776
MH Thermal Generation	39.123	41.425	45.594	43.612	38.365	41.181	45.084	45.980	47.736	49.235
Purchased Energy	170.701	179.710	206.998	188.473	190.629	208.679	222.634	233.009	244.857	253.887

AVERAGE PRICE ($/MW.h))	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Manitoba Domestic Energy Sales @ Approved Rates	$ 58.10	$ 58.06	$ 58.01	$ 57.97	$ 57.93	$ 57.89	$ 57.84	$ 57.79	$ 57.74	$ 57.69
Additional Domestic Revenue	24.65	27.52	30.50	32.24	34.02	35.84	37.68	39.55	41.47	43.41
Total Manitoba Domestic Energy Sales @ meter	82.75	85.58	88.51	90.21	91.95	93.73	95.52	97.34	99.21	101.11
Total Export Sales to Canada	98.43	102.66	106.17	122.49	113.84	110.43	114.54	118.87	123.17	127.58
Total Export Sales to USA	96.29	99.59	102.28	110.14	106.00	107.47	111.24	113.81	116.90	119.88
Total Export Sales	96.42	99.78	102.52	110.63	106.34	107.62	111.41	114.06	117.21	120.27
MH Hydraulic Generation	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	131.32	135.82	140.72	145.81	153.02	157.18	161.91	167.37	172.79	178.45
Purchased Energy	65.36	67.89	67.97	69.50	71.28	73.21	75.08	76.87	78.89	80.88

AVERAGE UNIT REVENUE CALCULATION: IFF10-2

VOLUMES (In GW.h)	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Demand:										
Manitoba Domestic Energy Sales	21049	21406	21663	22106	22339	22633	22970	23181	23405	23703
Domestic energy Losses	2922	3015	2874	2971	3008	3067	3185	2931	2981	3017
Firm & Opportunity Export Sales to Canada	453	409	754	712	702	674	657	657	647	472
Firm & Opportunity Export Sales to US	10417	8747	7085	6859	6579	6302	6002	5922	5696	6494
Export Transmission Losses	991	844	723	692	662	631	595	586	561	568
Total Demand Volumes:	**35832**	**34421**	**33099**	**33341**	**33290**	**33307**	**33409**	**33277**	**33289**	**34254**
Supply:										
MH Hydraulic Generation	34066	31360	30632	30801	30747	30755	30772	30588	30543	30648
MH Thermal Generation	80	89	413	410	391	379	390	424	437	206
Purchased Energy	1686	2972	2054	2130	2153	2173	2247	2265	2309	3400
Total Supply Volumes:	**35832**	**34421**	**33099**	**33341**	**33290**	**33307**	**33409**	**33277**	**33289**	**34254**
REVENUE/COST (in millions of dollars)										
Manitoba Domestic Energy Sales @ Approved Rates	1 194.396	1 222.667	1 234.645	1 254.182	1 264.873	1 279.182	1 295.669	1 307.088	1 319.996	1 335.987
Additional Domestic Revenue	0.000	41.587	87.200	135.121	185.714	238.808	295.336	353.782	415.640	481.801
Total Manitoba Domestic Energy Sales	1 194.396	1 264.254	1 321.845	1 389.303	1 450.587	1 517.990	1 591.005	1 660.870	1 735.636	1 817.788
Total Export Sales to Canada	15.916	14.805	44.424	44.943	48.720	50.830	51.991	54.890	56.694	45.044
Total Export Sales to USA	338.199	364.037	415.338	424.341	437.392	515.183	523.240	544.371	549.971	710.117
Total Export Sales	354.115	378.842	459.762	469.284	486.112	566.013	575.231	599.261	606.665	755.161
MH Hydraulic Generation	113.871	106.981	102.342	102.906	102.725	102.751	102.809	102.195	102.044	102.396
MH Thermal Generation	5.852	5.070	33.361	36.348	38.601	40.226	43.375	49.625	53.412	30.072
Purchased Energy	49.456	117.291	117.689	126.841	135.429	141.242	150.788	156.391	164.043	238.676
AVERAGE UNIT REVENUE ($/MW.h))										
Manitoba Domestic Energy Sales @ Approved Rates	$ 56.74	$ 57.12	$ 56.99	$ 56.74	$ 56.62	$ 56.52	$ 56.41	$ 56.39	$ 56.40	$ 56.36
Additional Domestic Revenue	-	1.94	4.03	6.11	8.31	10.55	12.86	15.26	17.76	20.33
Total Manitoba Domestic Energy Sales @ meter	56.74	59.06	61.02	62.85	64.93	67.07	69.27	71.65	74.16	76.69
Total Export Sales to Canada	35.13	36.20	58.90	63.11	69.44	75.42	79.11	83.50	87.60	95.49
Total Export Sales to USA	32.47	41.62	58.62	61.87	66.48	81.75	87.18	91.93	96.55	109.35
Total Export Sales	32.58	41.38	58.65	61.99	66.77	81.14	86.38	91.09	95.64	108.41
MH Hydraulic Generation	$ 3.34	$ 3.41	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	73.15	56.97	80.74	88.71	98.82	106.16	111.17	117.14	122.15	145.98
Purchased Energy	29.33	39.47	57.30	59.55	62.90	64.99	67.10	69.03	71.04	70.20

AVERAGE UNIT REVENUE CALCULATION: IFF10-2

VOLUMES (In GW.h)	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Demand:										
Manitoba Domestic Energy Sales	23998	24291	24592	24905	25228	25593	25960	26333	26707	27080
Domestic energy Losses	3036	3055	3114	3281	3279	3321	3380	3449	3508	3577
Firm & Opportunity Export Sales to Canada	438	436	432	373	544	736	747	742	723	704
Firm & Opportunity Export Sales to US	7965	9249	9260	10370	12960	13427	13184	12760	12485	12165
Export Transmission Losses	721	859	860	980	1258	1324	1303	1258	1225	1188
Total Demand Volumes:	**36158**	**37890**	**38258**	**39909**	**43269**	**44400**	**44575**	**44542**	**44648**	**44713**
Supply:										
MH Hydraulic Generation	32709	34433	34788	36658	40199	41400	41621	41557	41584	41577
MH Thermal Generation	221	424	446	521	376	327	313	300	313	319
Purchased Energy	3228	3034	3023	2731	2695	2673	2641	2685	2751	2818
Total Supply Volumes:	**36158**	**37890**	**38258**	**39909**	**43269**	**44400**	**44575**	**44542**	**44648**	**44713**
REVENUE/COST (In millions of dollars)										
Manitoba Domestic Energy Sales @ Approved Rates	1 351.599	1 367.068	1 383.049	1 399.844	1 417.223	1 436.615	1 456.218	1 476.109	1 496.123	1 515.866
Additional Domestic Revenue	551.442	596.011	642.459	691.019	741.688	795.350	851.196	909.346	969.777	1 032.291
Total Manitoba Domestic Energy Sales	1 903.041	1 963.079	2 025.508	2 090.863	2 158.911	2 231.965	2 307.414	2 385.455	2 465.900	2 548.157
Total Export Sales to Canada	44.023	42.691	43.675	37.685	58.154	79.491	84.389	88.096	89.162	90.461
Total Export Sales to USA	890.042	1 034.865	1 067.082	1 220.450	1 556.390	1 648.214	1 668.197	1 667.754	1 687.352	1 697.454
Total Export Sales	934.065	1 077.556	1 110.757	1 258.135	1 614.544	1 727.705	1 752.586	1 755.850	1 776.514	1 787.935
MH Hydraulic Generation	109.281	115.039	116.227	122.473	134.303	138.318	139.054	138.843	138.933	138.906
MH Thermal Generation	33.928	69.007	75.018	89.134	64.850	58.376	57.569	56.858	61.073	64.120
Purchased Energy	228.206	225.286	233.631	217.092	223.009	227.034	230.261	240.598	253.901	267.663
AVERAGE UNIT REVENUE ($/MW.h))										
Manitoba Domestic Energy Sales @ Approved Rates	$ 56.32	$ 56.28	$ 56.24	$ 56.21	$ 56.18	$ 56.13	$ 56.09	$ 56.06	$ 56.02	$ 55.98
Additional Domestic Revenue	22.98	24.54	26.12	27.75	29.40	31.08	32.79	34.53	36.31	38.12
Total Manitoba Domestic Energy Sales @ meter	79.30	80.81	82.36	83.95	85.58	87.21	88.88	90.59	92.33	94.10
Total Export Sales to Canada	100.51	97.87	101.08	101.06	106.81	108.06	112.97	118.66	123.37	128.61
Total Export Sales to USA	111.74	111.89	115.24	117.69	120.09	122.75	126.53	130.70	135.15	139.53
Total Export Sales	111.15	111.26	114.61	117.11	119.56	121.99	125.80	130.04	134.50	138.94
MH Hydraulic Generation	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	153.21	162.79	168.06	171.14	172.64	178.57	183.82	189.53	195.12	201.23
Purchased Energy	70.69	74.26	77.28	79.49	82.75	84.92	87.19	89.62	92.31	95.00

Section:	11	**Page No.:**	PUB/MH I-10 b Attachment B, Appendix 11.19
Topic:	Minimum Filing Requirements		
Subtopic:	Export Revenue		
Issue:	Changes in Export Revenue		

PREAMBLE TO IR (IF ANY):

QUESTION:

Please update Appendix 11.19 by adding a separate calculation sheet for the adjusted IFF14 in PUB/MH I-10b Attachment B.

RATIONALE FOR QUESTION:

To determine the impact of changes in assumptions made by Manitoba Hydro.

RESPONSE:

Appendix 11.19 has been updated for the scenario in PUB/MH-I-10b Attachment B and is provided in the schedule below.

AVERAGE UNIT REVENUE/COST CALCULATION - PUB-MH-I-10b - ATTACHMENT B Updated Interest Rates and Net Extraprovincial Revenues

VOLUMES (in GW.h)	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Demand:										
Manitoba Domestic Energy Sales	22214	22458	22458	22681	23009	23250	23318	23458	23664	23868
Domestic energy Losses	3108	3224	3264	3302	2987	3013	2982	2819	2947	2976
Firm & Opportunity Export Sales to Canada	851	489	880	833	856	870	753	744	802	583
Firm & Opportunity Export Sales to US	9184	8174	6444	6192	6143	6289	9464	10232	10207	10017
Net Transmission Losses	958	867	865	832	830	848	927	991	970	949
Total Demand Volumes	36315	35212	33681	33841	33624	34071	37444	38345	38389	38394
Supply:										
MH Hydraulic Generation	35116	33998	31084	31129	30907	31456	34535	35275	35251	35253
MH Thermal Generation	101	117	326	349	350	298	151	142	147	140
Purchased Energy	1098	1097	2281	2363	2367	2316	2758	2927	2991	3000
Total Supply Volumes	36315	35212	33691	33841	33624	34071	37444	38345	38389	38393

VOLUMES (in GW.h)	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Demand:										
Manitoba Domestic Energy Sales	24099	24336	24572	24807	25041	25325	25617	25817	26226	26546
Domestic energy Losses	3007	3040	3072	3107	3140	3178	3219	3260	3302	3346
Firm & Opportunity Export Sales to Canada	565	489	471	513	502	491	519	513	495	485
Firm & Opportunity Export Sales to US	9789	9462	9410	8980	8780	8559	8200	7870	7501	7258
Net Transmission Losses	919	884	877	840	819	793	784	727	692	684
Total Demand Volumes	38379	38211	38401	38227	38281	38347	38319	38287	38217	38297
Supply:										
MH Hydraulic Generation	35138	35078	35243	35141	35144	35146	35224	35125	35133	35157
MH Thermal Generation	148	148	155	122	118	120	108	107	108	108
Purchased Energy	3094	2984	3004	2964	3019	3082	2987	3056	2979	3031
Total Supply Volumes	38379	38211	38401	38227	38281	38347	38319	38287	38217	38297

REVENUE/COST (in millions of dollars)	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Total Manitoba Domestic Energy Sales:										
Manitoba Domestic Energy Sales @ Approved Rates	1 436.742	1 454.388	1 460.247	1 482.604	1 490.283	1 501.465	1 505.896	1 513.421	1 525.486	1 537.543
Additional Domestic Revenue	0.000	57.448	117.638	182.720	249.787	320.910	394.053	471.445	554.231	641.409
Manitoba Domestic Sales	1 436.742	1 511.836	1 577.885	1 665.324	1 740.070	1 822.375	1 899.949	1 984.866	2 079.717	2 178.952
Extraprovincial Revenue:										
Total Export Sales to Canada	28.748	15.008	40.529	40.469	43.892	47.264	43.325	45.051	32.637	33.462
Total Export Sales to USA	343.003	348.543	356.905	366.899	383.233	412.381	699.051	621.326	847.233	872.827
Other Non-Energy Related Revenues	19.698	15.880	2.765	2.820	2.876	2.934	2.990	3.046	3.104	3.163
Transmission Credits	17.443	22.140	23.841	24.294	24.755	24.824	25.296	25.776	26.266	26.765
Extraprovincial Revenue	406.892	401.571	428.040	434.282	454.757	467.403	770.661	695.199	909.441	938.216
Water Rentals & Assessments:										
MH Water Rentals	117.417	113.788	103.902	104.061	103.310	105.144	115.437	117.912	117.830	117.838
Assessments	4.934	5.683	6.165	6.329	6.499	6.567	6.742	6.923	7.108	7.300
Other Costs	2.118	2.116	2.100	2.118	2.137	2.154	2.172	2.190	6.977	7.443
Water Rentals & Assessments:	124.469	121.588	112.167	112.469	111.946	113.866	124.351	127.024	131.915	132.580
Fuel & Power Purchased:										
MH Thermal Generation	6.179	6.004	19.875	22.437	23.634	21.194	12.914	12.716	13.672	13.493
Purchased Energy	70.910	70.620	109.945	115.710	118.118	118.687	134.432	145.826	151.280	159.194
Other Non-Energy related Costs	14.142	12.663	8.777	9.148	9.453	9.588	12.078	28.005	16.313	18.730
Transmission Charges	42.958	37.416	48.013	50.034	50.985	51.131	67.564	67.344	67.969	68.612
Fuel & Power Purchased	134.189	126.702	186.610	197.329	202.191	200.480	226.866	251.891	249.234	258.030

REVENUE/COST (in millions of dollars)	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Total Manitoba Domestic Energy Sales:										
Manitoba Domestic Energy Sales @ Approved Rates	1 551.384	1 565.461	1 579.532	1 593.283	1 607.122	1 623.939	1 641.157	1 658.777	1 677.031	1 695.791
Additional Domestic Revenue	734.027	831.780	934.799	1 043.117	1 157.220	1 279.663	1 409.139	1 485.929	1 565.867	1 648.967
Manitoba Domestic Sales	2 285.411	2 397.241	2 514.331	2 636.400	2 764.342	2 903.602	3 050.296	3 144.706	3 242.898	3 344.758
Extraprovincial Revenue:										
Total Export Sales to Canada	33.521	29.599	29.061	33.987	33.757	34.152	37.658	38.543	37.962	38.380
Total Export Sales to USA	881.088	801.849	814.336	783.421	781.274	787.060	768.868	758.904	743.039	742.918
Other Non-Energy Related Revenues	3.223	3.285	3.347	3.411	3.475	3.542	3.609	3.677	3.747	3.818
Transmission Credits	27.274	27.792	28.320	28.858	29.406	29.965	30.534	31.114	31.706	32.308
Extraprovincial Revenue	945.106	862.325	875.067	849.877	847.913	854.718	840.667	832.239	816.473	817.424
Water Rentals & Assessments:										
MH Water Rentals	117.451	117.252	117.802	117.462	117.474	117.479	117.738	117.408	117.434	117.516
Assessments	7.496	7.696	7.903	8.115	8.334	8.558	8.789	9.026	9.268	9.521
Other Costs	7.710	7.671	7.770	7.976	8.163	8.486	8.844	9.123	9.605	9.908
Water Rentals & Assessments:	132.657	132.520	133.475	133.553	133.980	134.523	135.372	135.557	136.208	136.944
Fuel & Power Purchased:										
MH Thermal Generation	14.642	15.258	16.653	13.745	13.878	14.658	13.923	14.300	14.763	15.729
Purchased Energy	167.133	162.858	167.600	169.608	175.288	183.441	183.549	191.352	192.656	201.860
Other Non-Energy related Costs	17.215	17.688	18.198	18.556	19.048	19.579	20.064	20.810	21.174	21.773
Transmission Charges	69.275	70.213	70.914	71.636	72.378	73.141	78.423	79.229	80.057	80.908
Fuel & Power Purchased	268.265	266.014	273.386	273.544	280.692	290.818	295.959	306.492	308.650	320.269

AVERAGE UNIT REVENUE/COST ($/MW.h))	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Manitoba Domestic Energy Sales @ Approved Rates	$ 64.68	$ 64.76	$ 65.02	$ 64.80	$ 64.77	$ 64.58	$ 64.58	$ 64.52	$ 64.47	$ 64.42
Additional Domestic Revenue	-	2.56	6.24	7.99	10.86	13.80	16.90	20.10	23.42	26.87
Total Manitoba Domestic Energy Sales @ meter	64.68	67.32	70.26	72.78	75.62	78.38	81.48	84.61	87.89	91.29
Total Export Sales to Canada	35.66	39.76	52.70	54.55	57.39	60.62	65.42	66.94	64.26	67.98
Total Export Sales to USA (includes Net Trans Credits)	34.57	40.77	51.94	55.06	58.12	61.39	69.40	76.21	78.92	82.95
Total Export Sales	34.67	40.73	52.02	55.01	58.04	61.30	69.14	75.77	78.22	82.25
MH Hydraulic Generation (Water Rentals)	$ 3.34	$ 3.35	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	61.39	51.37	61.03	64.31	67.54	71.04	85.53	89.55	92.72	96.07
Purchased Energy (Including Assessments)	69.08	69.55	50.90	51.65	52.65	54.03	51.16	52.16	52.95	55.50

AVERAGE UNIT REVENUE/COST ($/MW.h))	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Manitoba Domestic Energy Sales @ Approved Rates	$ 64.38	$ 64.33	$ 64.28	$ 64.23	$ 64.18	$ 64.12	$ 64.07	$ 64.00	$ 63.94	$ 63.88
Additional Domestic Revenue	30.46	34.18	38.04	42.05	46.21	50.53	55.01	57.33	59.71	62.12
Total Manitoba Domestic Energy Sales @ meter	94.83	98.51	102.32	106.28	110.39	114.65	119.07	121.34	123.65	126.00
Total Export Sales to Canada	70.68	74.40	78.51	80.52	82.11	85.24	88.02	91.24	93.95	97.46
Total Export Sales to USA (includes Net Trans Credits)	85.72	80.24	82.01	82.66	84.09	86.91	87.93	90.31	92.61	95.67
Total Export Sales	85.02	80.01	81.80	82.57	84.00	86.83	87.93	90.36	92.68	95.76
MH Hydraulic Generation (Water Rentals)	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34	$ 3.34
MH Thermal Generation	99.18	103.09	107.44	112.66	117.70	122.43	129.03	134.10	139.75	145.03
Purchased Energy (Including Assessments)	56.44	57.15	58.43	59.85	60.82	62.30	64.39	65.57	67.79	69.73

Includes Keeyask - No Conawapa

4

Table 7

OPPORTUNITY EXPORTS						
	On Peak GWh	Off Peak GWh	On Peak Avg Price (CAD$)	Off Peak Avg Price (CAD$)	On Peak Revenues (CAD $M)	Off Peak Revenues (CAD $M)
2005/06 Winter	1,330	2,991	67.91	41.20	94	124
2005/06 Summer	1,813	4,170	76.48	34.34	151	141
2006/07 Winter	462	1,040	66.44	44.62	32	46
2006/07 Summer	1,510	3,238	66.08	35.33	103	114
2007/08 Winter	715	1,540	67.42	46.48	53	73
2007/08 Summer	1,497	3,347	65.84	26.96	109	93
2008/09 Winter	524	1,244	71.42	38.14	43	49
2008/09 Summer	1,278	2,993	72.13	25.84	110	85
2009/10 Winter	973	1,724	34.80	26.96	34	45
2009/10 Summer	1,524	3,376	29.00	15.24	50	55
2010/11 Winter	887	1,873	28.86	20.89	26	41
2010/11 Summer	1,381	2,826	33.93	21.33	50	64
2011/12 Winter	609	1,257	26.92	21.59	19	28
2011/12 Summer	1,319	3,293	28.68	19.03	40	65
2012/13 Winter	653	754	32.83	30.32	22	24
2012/13 Summer	1,512	2,532	28.60	19.50	47	53
2013/14 Winter	650	887	45.18	37.34	27	39
2013/14 Summer	1,842	3,679	33.87	21.43	55	82
2014/15 Winter	429	796	38.59	27.85	22	22
2014/15 Summer	1,360	3,082	33.00	22.03	45	70
2014/15 is to end of Dec/14						

Section:	Appendix 11.21 Revised	**Page No.:**	MFR
Topic:	Minimum Filing Requirements		
Subtopic:	Export Revenues		
Issue:	Opportunity Sales		

PREAMBLE TO IR (IF ANY):

Appendix 11.21, Table 3 is missing the 2014/15 column.

QUESTION:

Please add a column for 2014/15 to Table 3.

RATIONALE FOR QUESTION:

Missing data.

RESPONSE:

Please see the table below which revises Table 3 from Appendix 11.21 to include 2014/15.

	EXPORT REVENUES																				
	2008/09			2009/10			2010/11			2011/12			2012/13			2013/14			2014/15		
	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price
Opportunity																					
Bilateral Winter	357	29	70.79	489	18	38.30	970	26	27.15	685	21	29.39	658	24	36.36	508	22	42.38	301	12	39.46
Opportunity																					
Bilateral Summer	948	72	71.57	2139	42	19.95	881	26	29.87	1238	29	23.55	1042	30	28.65	963	31	32.67	1055	31	30.22
Market Winter																					
Day Ahead	1087	41	37.80	1435	33	23.11	946	17	17.77	473	8	15.34	363	10	25.59	608	8	36.27	727	21	29.19
Real Time	322	20	53.81	771	32	32.17	846	23	25.59	734	18	22.44	393	10	27.66	422	13	45.51	303	11	29.83
Market Summer																					
Day Ahead	2953	81	27.58	1676	26	15.64	2287	52	22.88	2247	44	19.41	2184	43	19.56	3643	101	23.89	2669	64	23.97
Real Time	368	40	48.31	1087	39	23.97	1037	37	27.76	1125	32	23.74	810	26	25.21	914	19	24.81	612	14	24.59
Merchant Winter	720	38	48.36	361	12	30.96	275	10	33.20	118	5	22.37	61	3	33.46	202	28	80.90	169	6	35.49
Merchant Summer	878	48	47.84	414	14	25.98	437	17	39.27	318	12	34.79	89	6	34.66	129	5	28.68	240	8	33.35

2014/15 is to end of Dec/14

5

Section:	3	**Page No.:**	PUB/MH I-10b Attachment b, PUB/MH I-14 (a)
Topic:	Integrated Financial Forecast and Economic Outlook		
Subtopic:	Export Revenue		
Issue:	Average Unit Export Revenue Changes		

PREAMBLE TO IR (IF ANY):

QUESTION:

a) Please provide a graphical comparison of average unit export prices comparing IFF14 with those included in PUB/MH I-10b Attachment B in a similar format as MH Exhibit #36 from the 2012/13 and 2013/14 GRA.

b) Update the response to PUB/MH I-14(a) to include the additional plot reflecting PUB/MH I-10b Attachment B.

c) Please include a table of the supporting data points for (b).

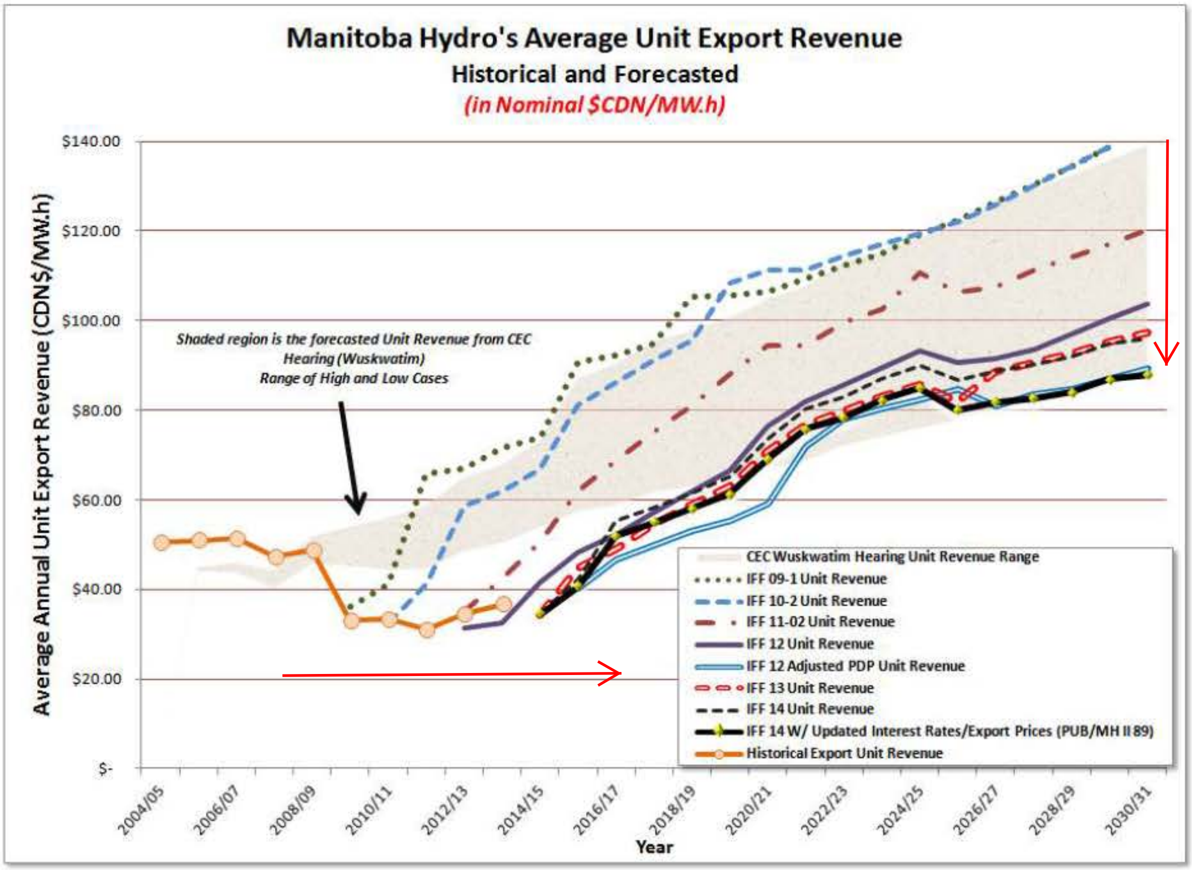
RATIONALE FOR QUESTION:

To assess changes the impact of changes in forecast assumptions.

RESPONSE:

a-b) The below chart is in the same format as the chart provided in Manitoba Hydro's response to PUB/MH-I-14a and Exhibit #36 from the 2012/13 and 2013/14 GRA, updated to include the additional information requested.

c) The below table provides the data displayed in the chart referenced in part a) - b).



Year	IFF 14 w/ Updated Interest Rates/Export Prices (PUB/MH II 89)	IFF 14	IFF 13	IFF 12 Adjusted PDP Unit Revenue	IFF 2012	IFF 2011-2	IFF 2010-2	IFF 2009-1	CEC Wuskwatim Hearing Unit Revenue Range Low	CEC Wuskwatim Hearing Unit Revenue Range High	Historical Export Unit Revenue
	All figures below in nominal CDN Dollars/MWh										
2004/05											$ 50.51
2005/06									$ 44.18	$ 45.05	$ 50.98
2006/07									$ 43.88	$ 46.04	$ 51.38
2007/08									$ 40.41	$ 44.29	$ 47.36
2008/09									$ 45.81	$ 51.85	$ 48.85
2009/10								$ 36.24	$ 45.37	$ 54.09	$ 32.99
2010/11							$ 32.58	$ 41.02	$ 44.46	$ 56.03	$ 33.31
2011/12							$ 41.38	$ 65.90	$ 44.71	$ 58.65	$ 31.10
2012/13					31.36	$ 35.14	$ 58.65	$ 66.89	$ 48.57	$ 64.98	$ 34.50
2013/14					32.61	$ 42.50	$ 61.99	$ 71.71	$ 50.45	$ 67.93	$ 36.71
2014/15	$ 34.67	$ 34.67	$ 34.29		41.63	$ 50.44	$ 66.77	$ 73.93	$ 53.95	$ 73.17	
2015/16	$ 40.73	$ 42.39	$ 44.88		48.14	$ 61.85	$ 81.14	$ 90.87	$ 57.60	$ 87.17	
2016/17	$ 52.02	$ 55.31	$ 49.00	$ 46.72	52.36	$ 68.78	$ 86.38	$ 92.31	$ 58.88	$ 90.37	
2017/18	$ 55.01	$ 58.28	$ 54.63	$ 49.78	57.23	$ 75.34	$ 91.09	$ 94.95	$ 61.83	$ 95.45	
2018/19	$ 58.04	$ 61.50	$ 58.91	$ 53.02	61.78	$ 81.14	$ 95.64	$ 105.31	$ 63.05	$ 97.78	
2019/20	$ 61.30	$ 65.11	$ 63.00	$ 55.49	66.52	$ 88.14	$ 108.41	$ 105.56	$ 64.71	$ 100.74	
2020/21	$ 69.14	$ 73.67	$ 70.86	$ 59.16	76.5	$ 94.29	$ 111.15	$ 106.50	$ 66.92	$ 104.82	
2021/22	$ 75.77	$ 80.20	$ 76.59	$ 72.04	81.96	$ 96.42	$ 111.26	$ 109.40	$ 68.82	$ 107.73	
2022/23	$ 78.22	$ 82.80	$ 79.78	$ 77.93	85.61	$ 99.78	$ 114.61	$ 112.30	$ 72.27	$ 113.04	
2023/24	$ 82.25	$ 87.12	$ 83.02	$ 80.46	89.62	$ 102.52	$ 117.11	$ 114.90	$ 74.22	$ 115.73	
2024/25	$ 85.02	$ 89.98	$ 85.58	$ 82.38	93.22	$ 110.63	$ 119.56	$ 119.40	$ 76.07	$ 118.48	
2025/26	$ 80.01	$ 86.71	$ 81.97	$ 84.78	90.57	$ 106.34	$ 121.99	$ 122.50	$ 77.98	$ 121.44	
2026/27	$ 81.80	$ 88.83	$ 88.51	$ 80.77	91.39	$ 107.62	$ 125.80	$ 126.40	$ 81.58	$ 126.28	
2027/28	$ 82.57	$ 90.19	$ 90.58	$ 83.50	93.48	$ 111.41	$ 130.04	$ 130.40	$ 83.62	$ 129.44	
2028/29	$ 84.00	$ 91.84	$ 92.64	$ 84.82	97.02	$ 114.06	$ 134.50	$ 134.50	$ 85.71	$ 132.52	
2029/30	$ 86.83	$ 94.91	$ 95.30	$ 87.15	100.42	$ 117.21	$ 138.94	$ 138.60	$ 88.02	$ 135.83	
2030/31	$ 87.93	$ 96.09	$ 97.27	$ 89.25	103.65	$ 120.27			$ 90.38	$ 139.23	

Section:	Tabs 5/9/11	Page No.:	PUB/MH I-69(a)
Topic:	Export Revenue Forecasts		
Subtopic:	Firm and Opportunity Sales into MISO		
Issue:	EPA impact on unit export revenues		

PREAMBLE TO IR (IF ANY):

In IFF14, MH anticipates EPA CO2 pricing impacts as early as 2016/17. PUB/MH I-69(a) suggests an EPA timeline that could be as late as 2019/20.

QUESTION:

Explain how CCCT generation costs will be affected by the EPA regulations. Please quantify the impact in ¢/kWh.

RATIONALE FOR QUESTION:

To explore the impact of the proposed new EPA regulations on export revenues to Manitoba Hydro.

RESPONSE:

Manitoba Hydro clarifies that the statement in the Preamble "In IFF14, MH anticipates EPA CO2 pricing impacts as early as 2016/17" is incorrect. Manitoba Hydro's export price forecast assumptions for IFF14 are based on a consensus view of electricity price forecast consultant work completed subsequent to the price forecast analysis utilized for NFAT. As indicated in Manitoba Hydro's response to PUB/MH-II-31a, the reference case consensus export pricing assumptions used for IFF14 do not contain any value for CO2 through 2019/20.

As noted in the response to PUB/MH-I-69a, each state has a unique emission intensity reduction target to meet by 2030. Following the release of the final rule, expected to be in the summer 2015, states will have one year (and up to two additional years if they choose to work with other states) to submit a plan to the EPA outlining how they will implement the rule and meet these unique emission intensity reduction targets.

The EPA's draft Clean Power Plan assigns each state an emissions rate goal, in pounds of carbon dioxide (CO2) per megawatt hour (MWh), but also gives states an option to translate this goal into a mass-based goal, in pounds of CO2. From an economic perspective, a regional carbon trading program with a mass-based cap is believed to be the most cost effective way to implement the carbon policy goals, but each state must make the decision whether to go in that direction.

The precise manner in which thermal generation costs, including CCCT generation costs are impacted by the proposed EPA regulations will depend upon the individual state implementation plans, which have not yet been developed, and could vary from state to state. Until EPA's final rule is issued and states develop their individual implementation plans, detailed modeling of the impacts of the Clean Power Plan is difficult.

Under the assumptions that a regional carbon trading program is implemented, carbon has a value of $30/ton (a value consistent with preliminary regional transmission organization assessments), and a CCCT generator has a carbon emissions rate of 0.5 tons of CO2 per MWh; then the incremental operating cost of the CCCT generator would be $15/MWh (1.5 cents/kWh). This example is illustrative of the potential cost impact on a CCCT generator. The actual impact on market prices will differ as the marginal generator in a power market can change as often as every five minutes, resulting in a different generation with different fuel/generation technology/emission rates setting the marginal price.

Section:	Tabs 5/9/11	**Page No.:**	PUB/MH I-69(a)
Topic:	Export Revenue Forecasts		
Subtopic:	Firm and Opportunity Sales into MISO		
Issue:	EPA impact on unit export revenues		

PREAMBLE TO IR (IF ANY):

In IFF14, MH anticipates EPA CO2 pricing impacts as early as 2016/17. PUB/MH I-69(a) suggests an EPA timeline that could be as late as 2019/20.

QUESTION:

Update PUB/MH I-81(b) average unit export price and potential opportunity sales unit prices to reflect recent trends in natural gas pricing and a delay in CO2 regulation.

RATIONALE FOR QUESTION:

To explore the impact of the proposed new EPA regulations on export revenues to Manitoba Hydro.

RESPONSE:

As noted in Manitoba Hydro's response to PUB/MH-II-31a, Manitoba Hydro can confirm that the reference case consensus export pricing assumptions used for IFF 14 do not contain any value for CO2 through 2019/20.

Please see Attachment B of Manitoba Hydro's response to PUB/MH-I-10b for a Projected Operating Statement for Updated Interest Rates and Net Extraprovincial Revenues.

Please see Manitoba Hydro's response to PUB/MH-II-89 for information regarding the requested unit revenue/ cost calculations. These revised financial documents reflect recent trends in natural gas pricing.

Section:	Appendix 11.15 Appendix 11.19	Page No.:	MFR 1 MFR 9
Topic:	Financial Information		
Subtopic:	Revenue Requirements		
Issue:	Net Export Revenue Forecasts		

PREAMBLE TO IR (IF ANY):

In Appendix 11.19, MH's net export revenue forecast assumes that MH's MISO sales will achieve unit prices of $65/MWh by 2019/20 compared to $31-34/MWh as experienced from 2009/10 to 2013/14.

QUESTION:

Please indicate Manitoba Hydro's CO2 pricing assumptions, including year of implementation and unit cost in $/MWh.

RATIONALE FOR QUESTION:

To test the impact of a deferral of carbon pricing in the MISO market.

RESPONSE:

Manitoba Hydro uses a consensus forecasting approach for its electricity export price forecast. Inputs to the models used by the price forecast consultants may include CO2 pricing in $/ton or $/tonne. CO2 unit costs in $/MWh are not an input into the price forecast models.

The specific details of Manitoba Hydro's electricity export price forecast, including details on specific pricing factors such as CO2 pricing assumptions, are commercially sensitive information, and therefore are confidential since public release could harm the Corporation in negotiation of contracts for export sales. However, Manitoba Hydro can confirm that the reference case consensus export pricing assumptions used for IFF 14 do not contain any value for CO2 through 2019/20.

The Preamble to the question indicates that average unit export revenues are projected to increase from $31-34/MWh in the 2013/14 timeframe to $65/MWh by 2019/20. As noted in Manitoba Hydro's response to PUB/MH-I-15c, the increase in the average unit revenue is due to a number of factors, including current high water conditions, new export contracts taking effect during the period, inflation and real increase in the market price of electricity.

Section:	Appendix 11.15 Appendix 11.19	Page No.:	MFR 1 MFR 9
Topic:	Financial Information		
Subtopic:	Revenue Requirements		
Issue:	Net Export Revenue Forecasts		

PREAMBLE TO IR (IF ANY):

In Appendix 11.19, MH's net export revenue forecast assumes that MH's MISO sales will achieve unit prices of $65/MWh by 2019/20 compared to $31-34/MWh as experienced from 2009/10 to 2013/14.

QUESTION:

Provide an IFF14 that assumes no carbon price until 2019/20.

RATIONALE FOR QUESTION:

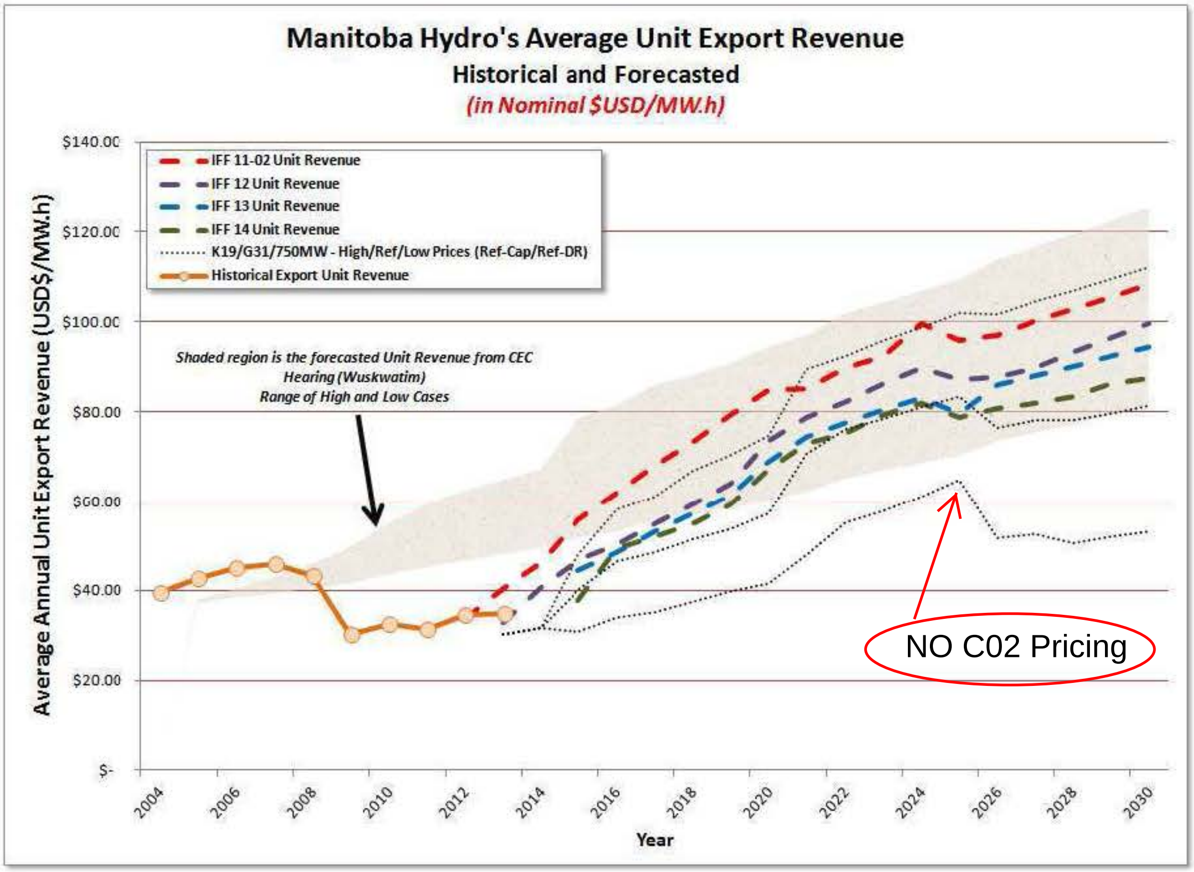
To test the impact of a deferral of carbon pricing in the MISO market.

RESPONSE:

A separate MH14 scenario assuming no carbon price until 2019/20 is not available. However, the Low Export Price Scenario included in IFF14 (Appendix 3.3, pages 22-24) assumes no carbon prices over the full 20-year forecast period.

Please note that the Low Export Price Scenario provides the financial impacts of a plausible lower bound for the forecast of long term export prices and includes factors such as low economic growth, aggressive energy conservation policies, low growth in energy demand, lower natural gas and coal prices and a US move to self-sufficiency in energy supply, in addition to no carbon prices.

The projected financial statements for the Low Export Price Scenario are provided in Appendix 3.5 (pages 20-25).


Manitoba Hydro's Average Unit Export Revenue
Historical and Forecasted
(in Nominal $USD/MW.h)
IFF 11-02 Unit Revenue
IFF 12 Unit Revenue
IFF 13 Unit Revenue
IFF 14 Unit Revenue
K19/G31/750MW - High/Ref/Low Prices (Ref-Cap/Ref-DR)
Historical Export Unit Revenue
Shaded region is the forecasted Unit Revenue from CEC Hearing (Wuskwatim) Range of High and Low Cases
NO C02 Pricing
Average Annual Unit Export Revenue (USD$/MW.h)
$140.00
$120.00
$100.00
$80.00
$60.00
$40.00
$20.00
$-
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
2028
2030
Year

Section:	Appendix 11.19(IFF14) Appendix 11.21 Revised	Page No.:	MFR 1 MFR 4
Topic:	Export Revenues		
Subtopic:	Unit Export Revenues		
Issue:	Average Flow Year Unit Revenue		

PREAMBLE TO IR (IF ANY):

MH has suggested that average flow year unit export prices would be higher than historical because Manitoba Hydro would reduce low-value sales.

QUESTION:

c) Plot the recalculated average total unit export annual revenues from 2014/15 out to 2023/24 using 2% escalation and 4% escalation.

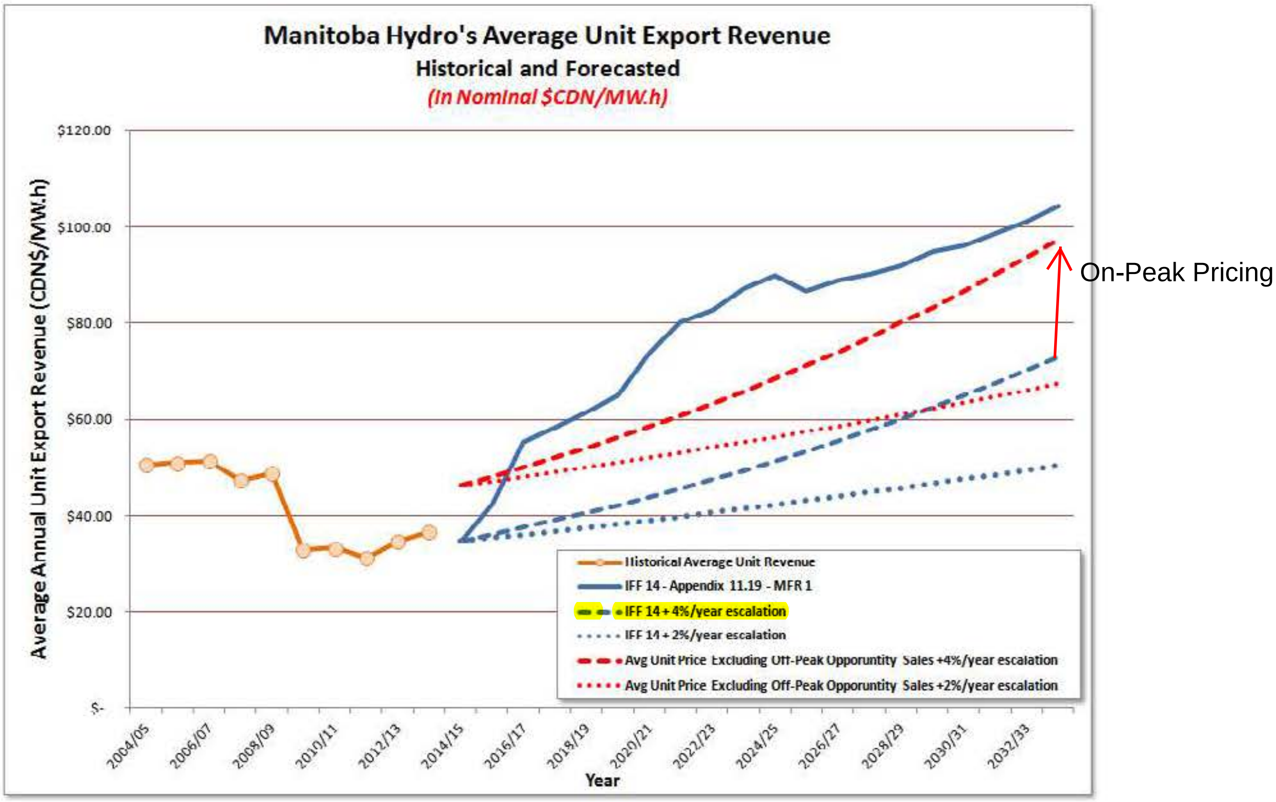
d) Plot the Appendix 11.19 total unit export revenues on the same graph as (c). Explain the natural gas price and CO2 emission pricing implications.

RATIONALE FOR QUESTION:

To explore the impact of low-flow years on export prices.

RESPONSE:

The chart below contains the information requested in both parts c & d.



Two sets of escalated curves are provided. The IFF14 escalated curves start with an initial value of $34.67/MWh, while the Average Unit Price Excluding Off Peak Opportunity Sales starts with an initial value of $46.24/MWh in 2014/15, as provided in Manitoba Hydro's response to PUB/MH-II-87a-b. Manitoba Hydro notes that in higher flow years, such as recently experienced, there is a higher proportion of export sales that occur in the lower priced off peak period, which has the effect of reducing the overall average unit export revenue, in comparison with an average water flow year.

No natural gas price and CO2 emission pricing implications can be discerned from the 2% escalation and 4% escalation lines.

6

RATIONALE FOR QUESTION:

To compare and assess the reasonableness of MH's historic export unit revenue prices with the forecast 75% increase in unit revenues by 2019/20.

RESPONSE:

Please see Manitoba Hydro's response to PUB/MH-I-15c which provides both historic and projected average unit revenues and describes factors affecting increases in average unit revenue over time.

The table below updates the data provided in NFAT PUB/MH I-015a.

It should be noted that the day-ahead energy market price in any interval is based on the variable cost of the marginal generation unit, which generally is a coal, natural gas combined cycle or single cycle natural gas generating unit, subject to transmission constraints.

Day-ahead opportunity energy sales are only one component of market revenue streams available to Manitoba Hydro. A significant portion of Manitoba Hydro's export revenues is from long term bilateral sales which include the value of generation capacity and the value to the customer of a long term supply from a renewable hydro resource.

Year	Henry Hub Natural Gas Monthly Gas Price Range (US$/MMBTU) Note 1	Average Annual Henry Hub Gas Price (US$/MMBTU) Note 1	Range of Efficient CCGT Variable Costs (US$/MWh) Note 2	Efficient CCCT Variable Costs based on Average Annual Gas Price (US$/MWh) Note 2	Physical Day Ahead Opportunity Market Avg Price	Opportunity Exports On-Peak Avg Price	Opportunity Export Off Peak Avg Price
2008/09	3.96 to 12.69	7.84	36.7 to 102	65.8	3.4¢/kWh	71.78 CAD$/MWh (7.2¢/kWh)	29.37 CAD$/MWh (2.9¢/kWh)
2009/10	2.99 to 5.83	4.09	29.4 to 50.7	37.7	2.2¢/kWh	31.14 CAD$/MWh (3.1¢/kWh)	18.74 CAD$/MWh (1.9¢/kWh)
2010/11	3.43 to 4.8	4.15	32.7 to 43	38.1	2.3¢/kWh	31.90 CAD$/MWh (3.2¢/kWh)	21.23 CAD$/MWh (2.1¢/kWh)
2011/12	2.17 to 4.54	3.57	23.3 to 41.0	33.8	2.1¢/kWh	28.76 CAD$/MWh (2.9¢/kWh)	22.51 CAD$/MWh (2.3¢/kWh)
2012/13	1.95 to 3.81	3.01	21.6 to 35.6	29.6	2.2¢/kWh	29.87 CAD$/MWh (3.0¢/kWh)	22.02 CAD$/MWh (2.2¢/kWh)
2013/14	3.43 to 6.01	4.16	32.7 to 52.08	38.2	3.4¢/kWh	43.64 CAD$/MWh (4.4¢/kWh)	26.33 CAD$/MWh (2.6¢/kWh)
2014/15 Note 3	3.00 to 4.63	4.01	29.5 to 41.73	37.1	2.9¢/kWh	35.68 CAD$/MWh (3.6¢/kWh)	22.85 CAD$/MWh (2.3¢/kWh)

Note 1 - Henry Hub Gulf Coast Monthly Natural Gas Prices are a monthly average of daily spot prices (in US$/MMBTU) from the US DOE EIA. Annual prices are an average of the 12 monthly averages for the fiscal year.

Note 2 - Efficient CCCT Variable Costs are in US$/MWh. Assumption of a heat rate of 7,500 MMBTU/MWh and a $7.00/MWh variable O&M are consistent with the assumptions in the illustrative example provided in Exhibit #MH-16 from the 2010 GRA.

Note 3 - To end of January 2015

In regards to the short term natural gas forecast, in February of 2015 the US Department of Energy (DOE) Energy Information Administration (EIA) released their Short Term Energy Outlook which provides a monthly natural gas forecast until December 2016. Due to the recent release of this forecast, it takes into account the commodity spot and futures price declines that occurred in late 2014 for both oil and natural gas.

Year	Henry Hub Monthly Average Forecasted Price Range (US$/MMBTU)	Average Forecasted Annual Henry Hub Gas Price (US$/MMBTU)
2015	2.79 to 3.41	3.05
2016	3.25 to 3.69	3.47

The EIA's Short Term Energy Forecast is available at: http://www.eia.gov/forecasts/steo/report/natgas.cfm. Reference case forecasts for the EIA's long term forecast, the 2015 Annual Energy Outlook, will not be available until March 2015.

3¢/kWh Avg On-Peak Price

RATIONALE FOR QUESTION:

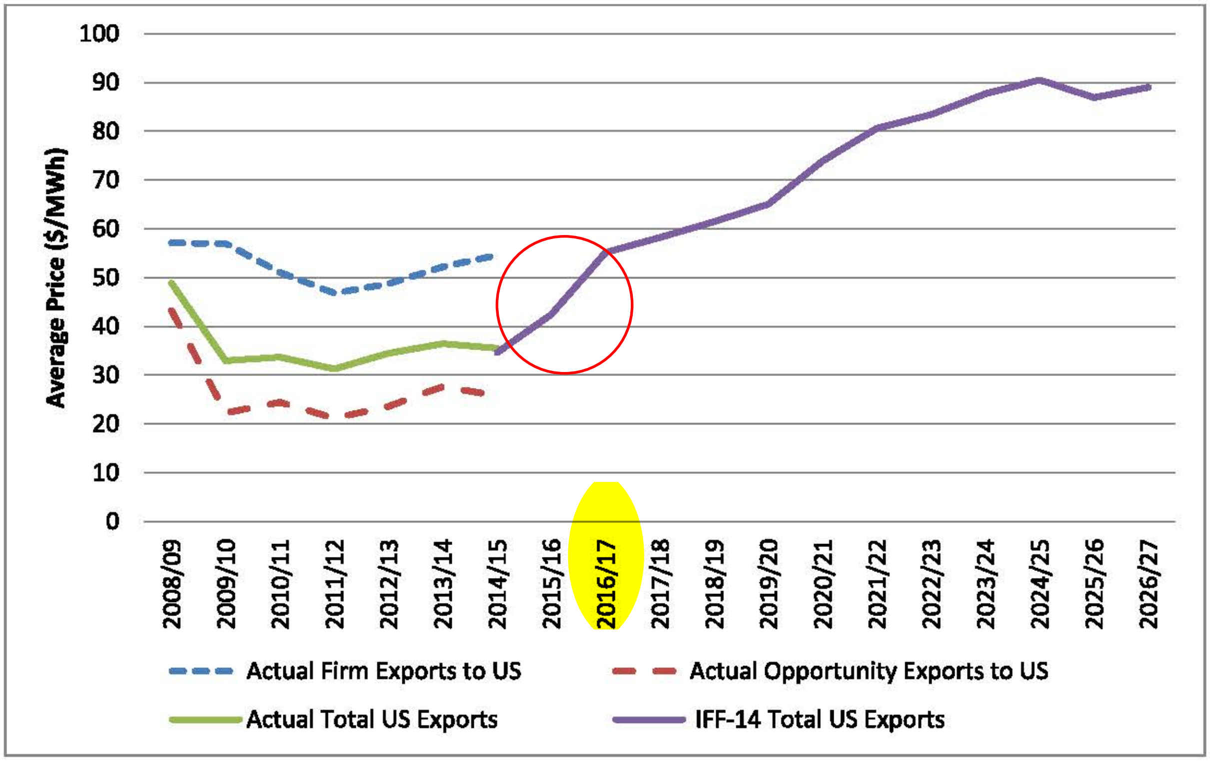
To compare and assess the reasonableness of MH's historic export unit revenue prices with the forecast 75% increase in unit revenues by 2019/20.

RESPONSE:

Please see Figure 1 below. Note that data labels have been modified from those used in the question because the average prices shown on the chart are for firm U.S. exports and opportunity U.S. exports; these include both bilateral and MISO market transactions. Similarly, future US unit revenues include bilateral sales with US customers as well as MISO market transactions. Also note that the actual average prices used for 2014/15 only represent the period of Apr to Dec 2014 and therefore are not an accurate reflection of the complete fiscal year.

As explained in Section 9.5 of the application, realized average opportunity prices are affected by water supply conditions. Water conditions have been well above average in recent history resulting in significant volumes of off peak opportunity sales which lower overall average opportunity prices. Average unit revenues in IFF14 for 2016/17 and later years reflect firm and average (based on MH's long term flow record) opportunity sale volumes, and therefore are not comparable to the historic prices shown.

Figure 1. Average Export Prices to US and IFF14 Average Unit Revenue for US Exports.



7

Section:	Tab 5:	**Page No.:**	
Topic:	Financial Results and Forecast		
Subtopic:	Export Revenues		
Issue:	Impact of US Legislation on Export Revenue		

PREAMBLE TO IR (IF ANY):

The Environmental Protection Agency (EPA) has indicated that in the summer of 2015, it intends to issue final rules with respect to existing stationary sources of carbon emissions as part of its Clean Power Plan.

QUESTION:

Has Manitoba Hydro performed an assessment regarding the impact of the Clean Power Plan on Manitoba Hydro? If yes, what are the conclusions of the assessment?

RATIONALE FOR QUESTION:

This question explores the impact of regulatory changes in the U.S. on Manitoba Hydro's exports.

RESPONSE:

On June 2, 2014, the U.S. Environmental Protection Agency (EPA), announced its proposed Clean Power Plan to cut carbon pollution from power plants. Manitoba Hydro has reviewed the U.S. EPA's draft Clean Power Plan and followed various related discussions. The over 700 page draft is written as a discussion document, asking for comment on a number of different alternative approaches and components that could be used to form a final rule. To date, the EPA has received over 3.8 million comments on its draft rule and supplemental materials. In multiple public forums, senior EPA officials have indicated that various components of the draft rule will change based on the extensive feedback received. The final rule is expected to be released during the summer of 2015.

The EPA indicated that across the US by 2030, the Clean Power Plan will help cut carbon emissions from the power sector by 30 percent from 2005 levels, while starting to make progress toward meaningful reductions in 2020. Under the draft plan, each state has a unique emission intensity reduction target to meet by 2030. Following the release of the final rule, states will have one year (and up to two additional years if they choose to work with other states) to submit a plan to the EPA outlining how they will implement the rule and meet these unique emission intensity reduction targets.

If it is ultimately implemented, it is anticipated that this regulation will impact the U.S. generation mix, carbon emissions and U.S. electricity prices. The EPA's regulatory impact analysis of the proposed plan projected that approximately 46 to 49 GW of additional coal-fired generation (about 19% of all coal-fired capacity and 4.6% of total generation capacity in 2020) may be removed from operation by 2020.

The impact of ongoing business and regulatory environment changes on the electricity markets is assessed annually. Environmental regulations including the Clean Power Plan are one of many factors considered by the electricity export market consultants engaged by Manitoba Hydro.

While the draft Clean Power Plan acknowledged that electricity imported from other countries such as Canada plays a role in U.S. electricity markets, it did not propose if or how this electricity could be treated under this rule. The potential role for Canadian hydropower will depend on the content of the final rule and implementation plans of Manitoba Hydro's key export states.

Section:	Tab 5:	Page No.:	
Topic:	Financial Results and Forecast		
Subtopic:	Export Revenues		
Issue:	Impact of US Legislation on Export Revenue		

PREAMBLE TO IR (IF ANY):

The Environmental Protection Agency (EPA) has indicated that in the summer of 2015, it intends to issue final rules with respect to existing stationary sources of carbon emissions as part of its Clean Power Plan.

QUESTION:

How will the rule change impact the electricity imported into Manitoba?

RATIONALE FOR QUESTION:

This question explores the impact of regulatory changes in the U.S. on Manitoba Hydro's exports.

RESPONSE:

The initial draft of the Clean Power Plan does not change the market rules for importing electricity into Manitoba. As explained in Manitoba Hydro's response to PUB/MH-I-69(a), if it is ultimately implemented, it is anticipated that this regulation will impact the U.S. generation mix, carbon emissions and U.S. electricity prices. To the extent the Clean Power Plan achieves its goal of cutting carbon emissions from existing power plants in the U.S., Manitoba Hydro expects that electricity imports may tend to have on average lower carbon emissions than they currently do.

8

Section:	Tab 3, App. 3.3	Page No.:	
Topic:	Integrated Financial Forecast & Economic Outlook		
Subtopic:	Export Revenues		
Issue:	US Exchange Rate Impact on Export Revenue		

PREAMBLE TO IR (IF ANY):

U.S. exports are paid for in U.S. dollars, while Manitoba Hydro's revenue requirement is in Canadian dollars. NFAT PUB/MH I-012(a) (revised Nov 2013) indicated the historical fluctuations on exchange rate revenue.

QUESTION:

Re-file an updated NFAT PUB/MH I-012(a) Revised that includes 2013/14 & 2014/15 actuals and the forecasts for 2016/17 to 2019/20.

Needs For and Alternatives To
PUB/MH I-012a REVISED

	1999/00 Actual	2000/01 Actual	2001/02 Actual	2002/03 Actual	2003/04 Actual	2004/05 Actual	2005/06 Actual
Canadian	90,233	109,275	92,615	84,143	53,601	78,255	172,938
U.S.	286,337	370,397	495,278	379,287	297,394	475,243	654,083
Total Extraprovincial Revenues	376,570	479,673	587,893	463,430	350,994	553,499	827,021
Average Exchange Rate	1.17	1.1723	1.5665	1.5445	1.3491	1.2732	1.1893
Average Price/MWh	34.26	39.09	49.02	48.93	49.91	50.51	50.98
U.S. Revenue in US$	244,732	315,958	316,169	245,573	220,439	373,267	549,973

	2006/07 Actual	2007/08 Actual	2008/09 Actual	2009/10 Actual	2010/11 Actual	2011/12 Actual	2012/13 Actual
Canadian	85,440	110,062	131,363	65,737	63,150	48,289	40,707
U.S.	506,985	514,909	491,283	360,904	335,157	314,755	311,926
Total Extraprovincial Revenues	592,426	624,971	622,646	426,641	398,307	363,044	352,633
Average Exchange Rate	1.1352	1.0256	1.1345	1.0846	1.0191	0.9895	1.0037
Average Price/MWh	51.38	47.36	48.85	32.99	33.31	31.10	34.50
U.S. Revenue in US$	446,604	502,056	433,039	332,753	328,875	318,095	310,776

RATIONALE FOR QUESTION:

In light of recent changes to the exchange rate, an update is required.

RESPONSE:

Please see the attached table which has been updated to include actual results for 2013/14 and forecasted results for 2014/15 through to 2019/20.

Manitoba Hydro's Foreign Currency Exchange Risk Policy establishes that the Corporation will manage its exposure to foreign currency exchange risk through the use of natural and accounting hedges, along with applicable financial instruments at appropriate times. The expected impacts on Manitoba Hydro's net income or loss due to changes in the U.S. exchange are minimal.

	1999/00 Actual	2000/01 Actual	2001/02 Actual	2002/03 Actual	2003/04 Actual	2004/05 Actual	2005/06 Actual
Canadian	90 233	109 275	92 615	84 143	53 601	78 255	172 938
U.S.	286 337	370 397	495 278	379 287	297 394	475 243	654 083
Total Extraprovincial Revenues	376 570	479 673	587 893	463 430	350 994	553 499	827 021
Average Exchange Rate	1.17	1.1723	1.5665	1.5445	1.3491	1.2732	1.1893
Average Price/MWh	34.26	39.09	49.02	48.93	49.91	50.51	50.98
U.S. Revenue in US$	244 732	315 958	316 169	245 573	220 439	373 267	549 973

	2006/07 Actual	2007/08 Actual	2008/09 Actual	2009/10 Actual	2010/11 Actual	2011/12 Actual	2012/13 Actual
Canadian	85 440	110 062	131 363	65 737	63 150	48 289	40 707
U.S.	506 985	514 909	491 283	360 904	335 157	314 755	311 926
Total Extraprovincial Revenues	592,426	624,971	622,646	426,641	398,307	363,044	352,633
Average Exchange Rate	1.1352	1.0256	1.1345	1.0846	1.0191	0.9895	1.0037
Average Price/MWh	51.38	47.36	48.85	32.99	33.31	31.10	34.64
U.S. Revenue in US$	446 604	502 056	433 039	332 753	328 875	318 095	310 776

	2013/14 Actual	2014/15 Forecast	2015/16 Forecast	2016/17 Forecast	2017/18 Forecast	2018/19 Forecast	2019/20 Forecast
Canadian	47 106	38 933	23 997	43 626	43 531	47 304	51 022
U.S.	392 077	369 959	410 160	406 112	413 426	431 373	463 255
Total Extraprovincial Revenues	439 182	408 892	434 157	449 738	456 958	478 677	514 277
Average Exchange Rate	1.0553	1.10	1.12	1.12	1.12	1.12	1.10
Average Price/MWh	36.71	34.67	42.39	55.31	58.28	61.50	65.11
U.S. Revenue in US$	371 531	336 326	366 215	362 600	369 131	385 155	421 141

9

Section:	5	Page No.:	24
Topic:	Exchange Rate hedging Policy		
Subtopic:	Revenue Requirement		
Issue:	Forecast Exchange rate forecasts and impact		

PREAMBLE TO IR (IF ANY):

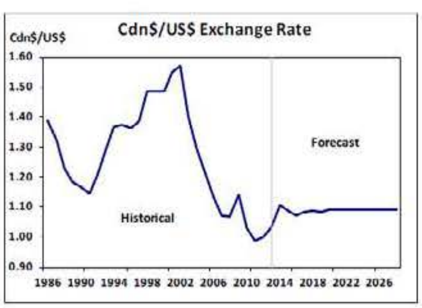
Manitoba Hydro claims it mitigates the impact of foreign exchange rate volatility by maintaining a natural hedge with US dollar interest expense.

QUESTION:

In its original filing MH used the following FX rate forecasts, essentially keeping the C$ rate constant at about 1.09 US. At the time of its interest rate update (September 2014) RBC used the FX rate forecast that follows the MH graphic and for convenience RBC's current forecast (February 4, 2015 follows its October 8, 2014 forecast. Please confirm this data

OUTLOOK:

Economic Outlook 2014 forecasts that the Canadian dollar is expected to remain low for the rest of the year and into the near term with a slight appreciation of a few cents. As the Bank of Canada will likely increase interest rates in 2015 this will pressure the Canadian dollar to increase, however, this change won't be very significant as the survey suggests the Federal Reserve to also move rates at similar times. Accordingly, narrowing Canada/U.S. interest rates will keep the dollar low and well below parity.



Year	US$/ Cdn.$	Cdn.$/ US$
1970	0.96	1.04
1975	0.98	1.02
1980	0.86	1.17
1985	0.73	1.37
1990	0.86	1.17
1995	0.73	1.37
1996	0.73	1.36
1997	0.72	1.38
1998	0.67	1.48
1999	0.67	1.49
2000	0.65	1.49
2001	0.64	1.55
2002	0.71	1.57
2003	0.77	1.40
2004	0.83	1.30
2005	0.88	1.21
2006	0.93	1.13
2007	0.94	1.07
2008	0.94	1.07
2009	0.88	1.14
2010	0.97	1.03
2011	1.01	0.99
2012	1.00	1.00
2013	0.97	1.03
2025	0.92	1.09
2035	0.92	1.09

RBC September 2014 FX rate Forecast

	Actuals							Forecast					
	13Q1	13Q2	13Q3	13Q4	14Q1	14Q2	14Q3	14Q4	15Q1	15Q2	15Q3	15Q4
Canadian dollar	1.02	1.05	1.03	1.06	1.11	1.07	1.12	1.15	1.16	1.17	1.17	1.18
Euro	1.28	1.30	1.35	1.38	1.38	1.37	1.26	1.23	1.20	1.18	1.17	1.17
U.K. pound sterling	1.52	1.52	1.62	1.66	1.67	1.71	1.62	1.60	1.56	1.49	1.44	1.43
New Zealand dollar	0.84	0.77	0.83	0.82	0.87	0.88	0.78	0.79	0.77	0.76	0.75	0.75
Japanese yen	94.2	99.1	98.3	105.3	103.2	101.3	109.7	111.0	113.0	115.0	118.0	120.0
Australian dollar	1.04	0.91	0.93	0.89	0.93	0.94	0.87	0.88	0.87	0.86	0.85	0.85

RBC February 4, 2015 forecast

	Actuals				Forecast							
	14Q1	14Q2	14Q3	14Q4	15Q1	15Q2	15Q3	15Q4	16Q1	16Q2	16Q3	16Q4
Canadian dollar	1.28	1.33	1.12	1.16	1.28	1.33	1.34	1.33	1.32	1.31	1.30	1.29
Euro	1.07	1.05	1.26	1.21	1.07	1.05	1.07	1.11	1.15	1.16	1.16	1.17
U.K. pound sterling	1.47	1.40	1.62	1.56	1.47	1.40	1.41	1.44	1.47	1.49	1.49	1.50
New Zealand dollar	0.87	0.88	0.78	0.78	0.69	0.67	0.65	0.64	0.63	0.63	0.62	0.62
Japanese yen	103.2	101.3	109.7	119.7	120.0	124.0	128.0	132.0	129.0	126.0	123.0	120.0
Australian dollar	0.93	0.94	0.87	0.82	0.75	0.74	0.73	0.72	0.71	0.71	0.70	0.70

RATIONALE FOR QUESTION:

Manitoba Hydro's IFF shows a projected $900 million loss to Manitoba Hydro. This goes to the credibility of its forecasts.

RESPONSE:

At the time of producing Manitoba Hydro's spring Economic Outlook in April 2014, the forecast of CAD/USD exchange rate from 2020/21 and on was 1.09 (refer to "Appendix A" of Manitoba Hydro's Spring 2014 Economic Outlook which is filed as part of Appendix 3.1 of Manitoba Hydro's GRA).

An update to the forecast of CAD/USD exchange rate was prepared for use in IFF14 based upon the consensus of source forecasts as of September 2014. The CAD/USD exchange rate forecast used in IFF14 reflects a consensus rate of 1.10 from 2019/20 and on (refer to "Appendix A-Fall 2014 Update" which is filed as the last page of Appendix 3.1 of Manitoba Hydro's GRA).

The table below was extracted from RBC's September 2014 Economic and Financial Market Outlook report and reflects the values used in Manitoba Hydro's September 2014 consensus forecast and IFF14. Manitoba Hydro can confirm the RBC September 2014 data points for

USD/CAD as included in the table provided in the question, with the exception of the 14Q3 value as this value was still a forecast (1.10) at the time Manitoba Hydro obtained RBC's forecast in September 2014, as noted in the table below.

		2013/14				2014/15				2015/16						
	Actual						Forecast						Actual		Forecast	
	13Q1	13Q2	13Q3	13Q4	14Q1	14Q2	14Q3	14Q4	15Q1	15Q2	15Q3	15Q4	2012	2013	2014	2015
AUD/USD	1.04	0.91	0.93	0.89	0.93	0.94	0.94	0.95	0.93	0.92	0.91	0.90	1.04	0.89	0.95	0.90
USD/CAD	1.02	1.05	1.03	1.06	1.11	1.07	1.10	1.15	1.16	1.17	1.17	1.18	0.99	1.06	1.15	1.18
EUR/USD	1.28	1.30	1.35	1.38	1.38	1.37	1.30	1.30	1.28	1.27	1.26	1.25	1.32	1.38	1.30	1.25
USD/JPY	94.2	99.1	98.3	105.3	103.2	101.3	104.0	103.0	103.0	105.0	107.0	110.0	86.8	105.3	103.0	110.0
NZD/USD	0.84	0.77	0.83	0.82	0.87	0.88	0.85	0.86	0.86	0.85	0.84	0.82	0.83	0.82	0.86	0.82
USD/CHF	0.95	0.95	0.90	0.89	0.89	0.89	0.93	0.94	0.96	0.97	0.98	0.99	0.92	0.89	0.94	0.99
GBP/USD	1.52	1.52	1.62	1.66	1.67	1.71	1.65	1.69	1.71	1.65	1.59	1.56	1.62	1.66	1.69	1.56

The table below was extracted from RBC's February 4, 2015 Financial Markets Monthly report and shows the "Canadian dollar" exchange rate at that time expressed as CAD/USD. Manitoba Hydro can confirm the RBC February 4, 2015 data points for USD/CAD as included in the table provided in the question, with the exception of the 14Q1 and 14Q2 actual values. The actual values are 1.11 and 1.07, respectively, as shown in the table below.

		2014/15				2015/16						
	Actuals				Forecast							
	14Q1	14Q2	14Q3	14Q4	15Q1	15Q2	15Q3	15Q4	16Q1	16Q2	16Q3	16Q4
Canadian dollar	1.11	1.07	1.12	1.16	1.28	1.33	1.34	1.33	1.32	1.31	1.30	1.29
Euro	1.38	1.37	1.26	1.21	1.07	1.05	1.07	1.11	1.15	1.16	1.16	1.17
U.K. pound sterling	1.67	1.71	1.62	1.56	1.47	1.40	1.41	1.44	1.47	1.49	1.49	1.50
New Zealand dollar	0.87	0.88	0.78	0.78	0.69	0.67	0.65	0.64	0.63	0.63	0.62	0.62
Japanese yen	103.2	101.3	109.7	119.7	120.0	124.0	128.0	132.0	129.0	126.0	123.0	120.0
Australian dollar	0.93	0.94	0.87	0.82	0.75	0.74	0.73	0.72	0.71	0.71	0.70	0.70

Section:	5	Page No.:	24
Topic:	Exchange Rate hedging Policy		
Subtopic:	Revenue Requirement		
Issue:	Forecast Exchange rate forecasts and impact		

PREAMBLE TO IR (IF ANY):

Manitoba Hydro claims it mitigates the impact of foreign exchange rate volatility by maintaining a natural hedge with US dollar interest expense.

QUESTION:

Please provide an updated foreign exchange rate forecast consistent with current market conditions.

RATIONALE FOR QUESTION:

Manitoba Hydro's IFF shows a projected $900 million loss to Manitoba Hydro. This goes to the credibility of its forecasts.

RESPONSE:

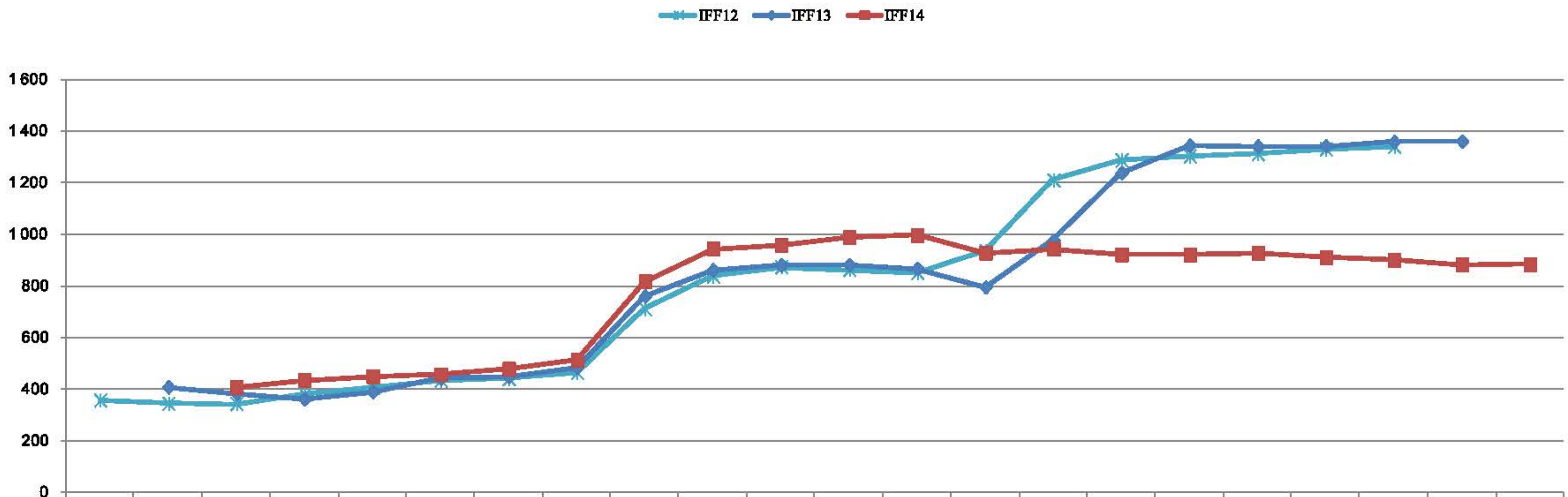
Table 1 below presents the forecast of CAD/USD exchange rate for the period 2014/15 – 2033/34 based on an update of end of January 2015 source forecasts. For copies of the source forecasts please refer to Manitoba Hydro's response to PUB/MH I-75c.

Table 1: CAD/USD Exchange Rate ($) – January 2015 Update

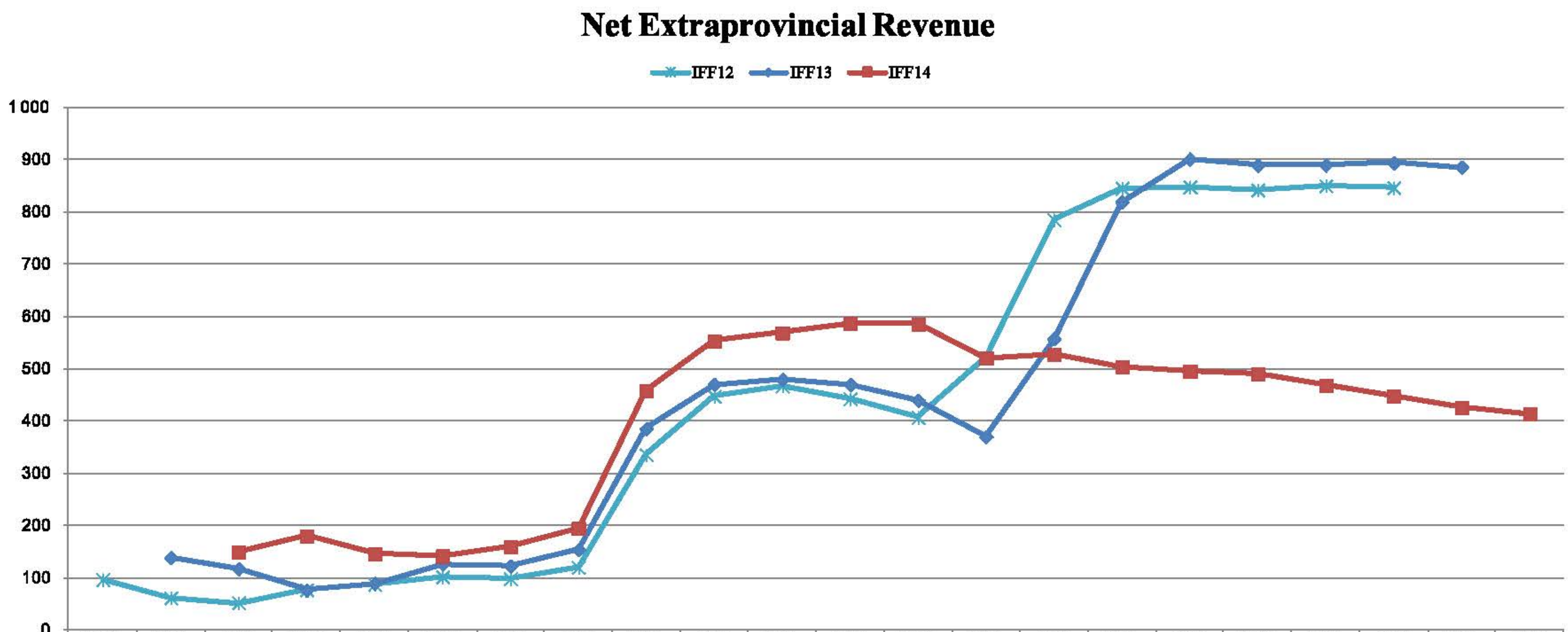
		IFF14 [PUB/MH I-13]
2014/15	1.13	1.10
2015/16	1.29	1.12
2016/17	1.25	1.12
2017/18	1.13	
2018/19	1.11	
2019/20	1.10	
2020/21	1.09	
2021/22	1.09	
2022/23	1.09	
2023/24	1.10	
2024/25	1.10	
2025/26	1.10	
2026/27	1.10	
2027/28	1.10	
2028/29	1.10	
2029/30	1.10	
2030/31	1.10	
2031/32	1.10	
2032/33	1.10	
2033/34	1.10	

10

Gross Extraprovincial Revenue



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
IFF12	357	344	343	380	406	435	441	464	711	839	873	863	851	937	1 209	1 288	1 304	1 312	1 331	1 341		
IFF13		408	383	362	390	441	448	484	760	862	880	881	867	795	976	1 238	1 344	1 342	1 342	1 358	1 360	
IFF14			409	434	450	457	479	514	817	943	959	987	996	928	944	921	920	927	911	901	883	884



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
IFF12	97	62	53	78	88	102	99	121	336	448	468	443	407	522	786	846	848	843	851	847		
IFF13		139	118	77	90	127	124	155	386	471	480	471	441	371	558	819	902	890	890	894	886	
IFF14			150	181	147	142	160	195	459	554	569	588	586	521	528	505	496	491	469	449	427	414

11

Section:	Tab 9	**Page No.:**	p. 7 of 23 Tab 9
Topic:	Energy Supply		
Subtopic:	Export Resources		
Issue:	Hydraulic Generation Available for Export		

PREAMBLE TO IR (IF ANY):

MH's 2014 PRP anticipates the following:

	Total Exports (GWh)	**Surplus Hydraulic Generation (GWh)**	
2014/15	11299	10110	
2015/16	10426	9151	
2016/17	8034	6428	
2017/18	7728	5011	-2489
2018/19	7698	3652	
2019/20	7876	3939	

QUESTION:

Confirm that MH's thermal generation and wind purchases are typically not competitive in the export market.

RATIONALE FOR QUESTION:

Extraprovincial revenues are deducted from revenue requirements.

RESPONSE:

This statement can only be partially confirmed.

Under normal water conditions, Manitoba Hydro's thermal generating resources are typically economic resources only under peak Manitoba / MISO market load conditions. Generation from Manitoba Hydro's simple cycle combustion turbines is typically not competitive relative to export market prices due to their very poor efficiencies.

The Climate Change and Emissions Reductions Act limits operation of coal fired generation in Manitoba to be for emergency purposes only, therefore Manitoba Hydro's coal fired generation is not dispatched for export purposes regardless of its market competitiveness.

Manitoba Hydro's wind PPAs are designed such that, if Manitoba Hydro were to choose to curtail wind energy, Manitoba Hydro would still be obligated to pay for the energy that would have otherwise been generated. Therefore, only in the rare circumstance where the market price of electricity went negative would it make economic sense for Manitoba Hydro to curtail the delivery of wind energy under its PPAs.

Wind generation provides a dependable energy resource to Manitoba Hydro's supply portfolio.

12

Export and Domestic Revenue MFR 3 (Revised)

Re-file Dec 2013 Revised PUB/MH 1-009 (NFAT) updated to end of 2014

- **Monthly NEB data on firm/interruptible by export permit number plus imports**
- **Separately summarizes summer and winter components for each year**

Please see the tables below.

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Apr-08	144	17,554	1,331,013	7.6						
	155	21,063	1,081,235	5.1						
	224	175,438	9,140,552	5.2						
	259	523	33,718	6.4						
	269				674,057	38,710,758	5.7			
								498	56,930	11.4
May-08	35	81,724	3,401,427	4.2						
	144	17,600	1,282,846	7.3						
	155	21,120	1,087,816	5.2						
	224	175,500	9,220,917	5.3						
	259	396	28,906	7.3						
	269				699,599	31,370,396	4.5			
								500	47,713	9.5
Jun-08	33	19,490	697,220	3.6						
	34	14,617	522,897	3.6						
	35	73,902	3,379,308	4.6						
	144	16,407	1,233,972	7.5						
	155	19,866	1,068,185	5.4						
	224	162,001	8,977,792	5.5						
	259	475	31,630	6.7						
	269				494,860	24,520,507	5.0			
								4,897	744,598	15.2
Jul-08	33	70,400	2,535,990	3.6						
	34	52,800	1,901,992	3.6						
	35	96,900	5,633,561	5.8						
	144	18,380	1,375,994	7.5						
	155	22,055	1,157,066	5.2						
	224	183,686	9,799,722	5.3						
	259	366	28,736	7.9						
	269				799,886	37,260,178	4.7			
								1,106	134,304	12.1
Aug-08	33	67,200	2,507,804	3.7						
	34	50,400	1,880,853	3.7						
	35	108,900	4,898,303	4.5						
	144	16,788	1,314,433	7.8						
	155	20,160	1,125,657	5.6						
	224	168,000	9,583,228	5.7						
	259	383	29,647	7.7						
	269				859,734	34,817,392	4.0			
								2,356	254,097	10.8

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Sep-08	33	19,210	705,067	3.7						
	34	14,407	536,282	3.7						
	35	106,950	3,584,400	3.4						
	144	17,428	1,354,954	7.8						
	155	21,120	1,159,702	5.5						
	224	173,640	9,762,961	5.6						
	259	357	28,666	8.0						
	269				795,097	23,433,570	2.9			
								492	52,767	10.7
Oct-08	35	111,600	4,153,724	3.7						
	144	18,400	1,633,552	8.9						
	155	22,080	1,373,405	6.2						
	224	184,000	11,635,701	6.3						
	259	384	29,688	7.7						
	269				694,487	24,144,820	3.5			
								1,199	82,222	6.9
Nov-08	144	15,994	1,465,977	9.2						
	155	19,200	1,265,540	6.6						
	224	160,000	10,819,982	6.8						
	259	642	39,378	6.1						
	269				614,926	24,241,549	3.9			
								300	8,925	3.0
Dec-08	144	18,381	1,642,812	8.9						
	155	22,080	1,382,550	6.3						
	224	158,320	10,639,551	6.7						
	259	854	52,411	6.1						
	269				197,415	13,641,499	6.9			
								48,883	1,682,653	3.4
Jan-09	144	17,600	1,595,364	9.1						
	155	21,117	1,352,687	6.4						
	224	161,779	10,888,078	6.7						
	259	1,192	68,796	5.8						
	269				123,830	7,442,112	6.0			
								61,915	2,559,045	4.1
Feb-09	144	16,000	1,506,201	9.4						
	155	19,200	1,301,862	6.8						
	224	156,110	10,944,203	7.0						
	259	833	50,946	6.1						
	269				173,600	8,571,553	4.9			
								6,749	344,517	5.1
Mar-09	144	17,568	1,623,272	9.2						
	155	21,120	1,378,863	6.5						
	224	172,308	11,550,659	6.7						
	259	833	50,946	6.1						
	269				194,748	8,194,807	4.2			
								19,095	719,180	3.8

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Apr-09	144	17,541	1,536,031	8.8						
	155	21,049	1,303,354	6.2						
	224	175,418	11,070,661	6.3						
	259	639	40,227	6.3						
	269				466,954	11,164,381	2.4			
								500	61,317	12.3
May-09	33	47,217	629,505	1.3						
	34	35,430	469,493	1.3						
	35	52,174	1,046,940	2.0						
	144	16,588	1,445,711	8.7						
	155	9,928	587,038	5.9						
	224	287,476	11,604,608	4.0						
	259	481	35,977	7.5						
	269				448,634	10,411,481	2.3			
								813	33,550	4.1
Jun-09	33	86,711	2,357,030	2.7						
	34	6,588	1,805,106	27.4						
	35	7,200	308,462	4.3						
	144	17,600	1,617,138	9.2						
	155	16,078	758,261	4.7						
	224	303,767	13,019,826	4.3						
	259	461	35,204	7.6						
	269				434,693	11,286,387	2.6			
								1,851	32,292	1.7
Jul-09	33	119,319	2,928,700	2.5						
	34	89,632	2,197,587	2.5						
	35	2,250	58,679	2.6						
	144	18,400	1,562,504	8.5						
	155	14,731	680,137	4.6						
	224	358,969	12,602,626	3.5						
	259	394	32,545	8.3						
	269				521,232	10,303,089	2.0			
								1,851	160,870	8.7
Aug-09	33	132,126	3,214,448	2.4						
	34	9,063	2,410,700	26.6						
	35	1,650	43,737	2.7						
	144	16,800	1,463,074	8.7						
	155	13,800	653,061	4.7						
	224	362,391	12,705,102	3.5						
	259	425	33,766	7.9						
	269				512,427	11,298,361	2.2			
								495	34,035	6.9
Sep-09	33	28,367	961,127	3.4						
	34	21,352	724,358	3.4						
	144	16,888	1,437,114	8.5						
	155	15,644	682,116	4.4						
	224	176,859	9,980,692	5.6						
	259	320	29,621	9.3						
	269				721,192	13,904,731	1.9			
								437	41,672	9.5

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Oct-09	35	77,706	2,358,613	3.0						
	144	17,358	1,480,174	8.5						
	155	10,416	596,508	5.7						
	224	173,876	10,162,359	5.8						
	269				866,924	20,512,094	2.4			
	345	527	37,820	7.2						
								0	0	0.0
Nov-09	144	16,800	1,410,645	8.4						
	155	10,080	572,268	5.7						
	224	168,000	9,756,683	5.8						
	269				652,817	15,208,111	2.3			
	345	503	36,853	7.3						
								12,766	291,376	2.3
Dec-09	144	18,337	1,510,887	8.2						
	155	11,002	602,185	5.5						
	224	178,620	10,045,274	5.6						
	269				180,369	7,233,228	4.0			
	345	785	50,708	6.5						
								96,983	2,446,474	2.5
Jan-10	144	16,800	1,420,784	8.5						
	155	10,080	576,381	5.7						
	224	157,869	9,449,930	6.0						
	269				294,690	12,031,863	4.1			
	345	1,004	61,779	6.2						
								78,020	1,928,233	2.5
Feb-10	144	1,600	1,344,224	84.0						
	155	9,600	550,946	5.7						
	224	159,086	9,384,649	5.9						
	269				238,998	9,492,286	4.0			
	345	948	58,242	6.1						
								43,325	1,060,605	2.4
Mar-10	144	18,389	1,469,898	8.0						
	155	11,033	585,515	5.3						
	224	183,900	9,935,043	5.4						
	269				496,047	14,153,374	2.9			
	345	684	46,670	6.8						
								1,107	15,147	1.4
Apr-10	144	17,111	1,371,751	8.0						
	155	10,308	556,029	5.4						
	224	171,379	9,453,481	5.5						
	269				502,793	11,922,854	2.4			
	345	455	34,287	7.5						
								1,175	19,334	1.6
May-10	35	53,700	1,874,870	3.5						
	155	10,080	573,486	5.7						
	224	167,000	9,737,141	5.8						
	269				194,547	7,894,406	4.1			
	345	357	25,898	7.3						
								122,179	2,634,286	2.2

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Jun-10	33	37,900	1,460,750	3.9						
	34	28,495	1,098,260	3.9						
	35	82,651	2,570,108	3.1						
	155	10,560	599,904	5.7						
	224	171,412	10,026,035	5.8						
	269				461,086	13,150,740	2.9			
	273	4	515	12.9						
	345	356	25,910	7.3						
								5,241	60,258	1.1
Jul-10	33	56,900	2,127,711	3.7						
	34	42,672	1,595,671	3.7						
	35	106,253	3,410,437	3.2						
	155	10,511	580,139	5.5						
	224	175,324	9,869,728	5.6						
	269				738,392	19,473,860	2.6			
	345	424	28,688	6.8						
								3,755	218,864	5.8
Aug-10	33	55,590	2,149,228	3.9						
	34	41,765	1,614,724	3.9						
	35	110,249	3,928,184	3.6						
	155	10,403	595,507	5.7						
	224	173,783	10,146,551	5.8						
	269				748,854	22,321,983	3.0			
	345	374	25,689	6.9						
								1,660	56,302	3.4
Sep-10	33	25,000	935,573	3.7						
	34	18,600	696,067	3.7						
	35	97,125	2,254,630	2.3						
	155	21,600	801,336	3.7						
	224	175,000	9,865,613	5.6						
	269				656,585	13,486,571	2.1			
	345	395	28,650	7.3						
								1,654	56,879	3.4
Oct-10	33	639	23,658	3.7						
	34	484	17,919	3.7						
	35	107,046	2,616,994	2.4						
	155	10,069	557,502	5.5						
	224	167,819	9,501,757	5.7						
	269				788,954	18,110,622	2.3			
	345	389	27,656	7.1						
								2,192	100,023	4.6
Nov-10	33									
	34									
	35									
	155	10,560	580,559	5.5						
	224	167,297	9,553,709	5.7						
	269									
	345	545	37,269	6.8						
	355				547,247	12,127,472	2.2			
								10,623	554,475	5.2

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Dec-10	155	11,040	580,475	5.3						
	224	153,546	8,774,516	5.7						
	345	786	51,282	6.5						
	355				303,045	8,939,053	2.9			
								25,018	682,532	2.7
Jan-11	155	10,080	548,832	5.4						
	224	112,447	7,386,342	6.6						
	345	1,191	71,423	6.0						
	352	8	915	11.4						
	355				245,554	7,812,197	3.2			
								24,152	721,794	3.0
Feb-11	155	9,596	515,658	5.4						
	224	121,398	7,485,752	6.2						
	345	936	60,466	6.5						
	355				330,931	7,867,230	2.4			
								7,413	203,037	2.7
Mar-11	155	11,032	566,877	5.1						
	224	167,830	9,063,793	5.4						
	345	858	57,603	6.7						
	355				502,988	11,600,765	2.3			
								6,029	189,946	3.2
Apr-11	155	15,572	606,291	3.9						
	224	164,230	8,726,760	5.3						
	345	579	39,945	6.9						
	355				618,224	14,188,453	2.3			
								3,256	109,433	3.4
May-11	35	42,777	792,209	1.9						
	155	16,324	648,972	4.0						
	224	173,679	9,311,462	5.4						
	345	368	28,018	7.6						
	355				797,049	15,842,119	2.0			
								5,182	(1,351)	0.0
Jun-11	33	41,459	1,464,428	3.5						
	34	31,095	1,098,347	3.5						
	35	107,501	2,191,176	2.0						
	155	15,915	636,843	4.0						
	224	174,716	9,303,831	5.3						
	345	363	26,742	7.4						
	352	4	598	15.0						
	355				646,648	12,969,331	2.0			
								8,705	393,106	4.5
Jul-11	33	50,289	1,756,982	3.5						
	34	37,717	1,317,745	3.5						
	35	111,478	3,815,718	3.4						
	155	10,055	528,715	5.3						
	224	164,093	8,878,007	5.4						
	345	429	29,265	6.8						
	355				875,740	24,180,464	2.8			
								639	71,427	11.2

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Aug-11	33	51,800	1,856,449	3.6						
	34	38,850	1,392,337	3.6						
	35	110,100	3,291,117	3.0						
	155	11,040	576,490	5.2						
	224	180,211	9,631,375	5.3						
	345	362	25,789	7.1						
	355				793,003	19,359,907	2.4			
								1,264	132,285	10.5
Sep-11	33	30,775	1,171,140	3.8						
	34	23,090	878,688	3.8						
	35	98,726	2,285,351	2.3						
	155	15,629	675,726	4.3						
	224	164,376	9,640,954	5.9						
	345	383	27,659	7.2						
	355				486,600	10,262,974	2.1			
								9,098	199,844	2.2
Oct-11	35	108,181	2,373,741	2.2						
	155	13,777	603,480	4.4						
	224	166,825	9,306,310	5.6						
	345	347	28,276	8.1						
	355				510,915	9,244,684	1.8			
								3,209	77,832	2.4
Nov-11	35	91,504	2,321,519	2.5						
	155	10,417	585,995	5.6						
	224	163,189	9,575,319	5.9						
	345	494	35,603	7.2						
	355				298,541	7,194,432	2.4			
								23,347	491,168	2.1
Dec-11	35	73,016	2,086,927	2.9						
	155	10,560	580,752	5.5						
	224	119,976	7,829,309	6.5						
	345	684	46,526	6.8						
	352	6	813	13.6						
	355				159,283	4,441,916	2.8			
								45,055	1,041,320	2.3
Jan-12	35	70,101	1,685,321	2.4						
	155	10,560	574,013	5.4						
	224	112,150	7,458,255	6.7						
	345	966	62,509	6.5						
	355				178,927	4,636,174	2.6			
								45,241	716,312	1.6
Feb-12	35	68,150	1,666,184	2.4						
	155	10,080	545,463	5.4						
	224	147,786	8,572,594	5.8						
	345	826	55,996	6.8						
	355				93,295	3,015,205	3.2			
								95,568	1,766,968	1.8

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Mar-12	35	68,747	1,455,483	2.1						
	155	10,514	568,790	5.4						
	224	172,839	9,572,792	5.5						
	345	651	45,895	7.0						
	355				230,778	5,366,606	2.3			
								75,530	1,022,020	1.4
Apr-12	35	55,841	1,221,903	2.2						
	155	9,315	517,831	5.6						
	224	156,012	8,877,846	5.7						
	345	453	32,264	7.1						
	355				236,123	5,873,395	2.5			
								52,158	531,110	1.0
May-12	35	76,063	2,221,192	2.9						
	224	184,000	10,579,446	5.7						
	345	341	27,081	7.9						
	355				464,857	13,582,975	2.9			
								31,231	768,543	2.5
Jun-12	33	40,012	1,529,924	3.8						
	34	30,006	1,147,328	3.8						
	35	86,734	2,207,808	2.5						
	224	165,407	9,726,511	5.9						
	345	376	28,743	7.6						
	352	4	603	15.1						
	355				535,127	11,377,035	2.1			
								25,972	593,308	2.3
Jul-12	33	52,764	1,982,477	3.8						
	34	39,572	1,486,820	3.8						
	35	105,142	3,420,647	3.3						
	224	171,959	9,802,259	5.7						
	345	455	31,292	6.9						
	355				837,601	21,851,425	2.6			
								1,076	155,753	14.5
Aug-12	33	54,842	2,029,482	3.7						
	34	41,127	1,521,945	3.7						
	35	110,079	2,538,456	2.3						
	224	182,292	10,030,869	5.5						
	345	356	25,882	7.3						
	355				861,775	16,724,262	1.9			
								965	131,401	13.6
Sep-12	33	25,700	948,547	3.7						
	34	19,276	711,447	3.7						
	35	106,275	2,112,887	2.0						
	224	159,207	9,166,095	5.8						
	345	373	28,105	7.5						
	355				721,490	13,980,585	1.9			
								1,054	5,994	0.6

85

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Oct-12	35	83,081	2,206,126	2.7						
	224	182,081	10,148,590	5.6						
	345	440	38,755	8.8						
	355				344,967	10,007,508	2.9			
								14,646	152,582	1.0
Nov-12	35	67,050	1,927,256	2.9						
	224	159,745	9,274,114	5.8						
	345	576	39,686	6.9						
	355				225,082	6,652,755	3.0			
								37,599	843,016	2.2
Dec-12	35	61,875	2,123,564	3.4						
	224	129,155	8,179,452	6.3						
	345	729	51,157	7.0						
	352	11	1,300	11.8						
	355				84,723	3,604,653	4.3			
								132,654	3,112,020	2.3
Jan-13	35	66,150	2,181,518	3.3						
	224	169,751	9,694,967	5.7						
	345	1,172	76,021	6.5						
	355				86,194	3,545,803	4.1			
								121,703	3,513,341	2.9
Feb-13	35	66,150	2,076,848	3.1						
	224	155,269	9,453,748	6.1						
	345	1,157	75,852	6.6						
	355				153,549	5,156,723	3.4			
								55,965	1,849,321	3.3
Mar-13	35	86,700	2,820,083	3.3						
	224	168,000	9,789,201	5.8						
	345	771	55,660	7.2						
	355				352,598	11,406,112	3.2			
								10,005	374,131	3.7
Apr-13	35	103,820	3,357,126	3.2						
	224	171,343	9,831,099	5.7						
	345	672	47,102	7.0						
	355				354,939	11,822,526	3.3			
								17,123	495,957	2.9
May-13	35	111,440	3,163,407	2.8						
	224	183,788	10,749,558	5.8						
	345	341	27,081	7.9						
	355				464,857	13,582,975	2.9			
								2,505	87,170	3.5
Jun-13	33	32,938	1,322,307	4.0						
	34	24,702	991,670	4.0						
	35	107,636	2,945,708	2.7						
	224	158,794	9,953,623	6.3						
	345	414	31,011	7.5						
	352	9	1,175	13.1						
	355				852,421	20,994,789	2.5			
								1,686	91,559	5.4

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Jul-13	33	60,366	2,371,542	3.9						
	34	45,275	1,778,676	3.9						
	35	111,334	3,463,052	3.1						
	224	183,917	10,700,422	5.8						
	345	434	32,283	7.4						
	355				955,531	25,629,741	2.7			
								2,474	186,819	7.6
Aug-13	33	54,620	2,201,290	4.0						
	34	41,003	1,652,499	4.0						
	35	111,495	3,339,358	3.0						
	224	174,750	10,617,822	6.1						
	345	376	28,247	7.5						
	379	80,023	2,216,928	2.8						
	355				902,359	22,540,778	2.5			
								2,469	433,454	17.6
Sep-13	33	20,789	816,559	3.9						
	34	15,585	612,154	3.9						
	35	80,035	2,134,183	2.7						
	224	130,146	8,644,370	6.6						
	345	376	30,511	8.1						
	379	57,526	1,435,549	2.5						
	355				651,033	15,711,517	2.4			
								2,679	104,702	3.9
Oct-13	35	106,105	3,045,103	2.9						
	224	183,718	10,840,420	5.9						
	345	415	32,481	7.8						
	379	53,097	1,701,338	3.2						
	355				752,750	19,523,112	2.6			
								738	24,482	3.3
Nov-13	35	83,290	2,287,598	2.7						
	224	153,190	9,815,402	6.4						
	345	696	49,473	7.1						
	379	25,132	796,919	3.2						
	355				310,592	8,792,251	2.8			
								21,725	539,951	2.5
Dec-13	35	52,414	2,191,693	4.2						
	224	136,243	9,517,567	7.0						
	345	893	64,070	7.2						
	352	16	1,926	12.0						
	355				89,619	4,554,245	5.1			
								73,075	2,707,912	3.7
Jan-14	35	20,400	883,602	4.3						
	224	179,829	11,397,041	6.3						
	345	1,339	88,923	6.6						
	355				90,736	7,153,983	7.9			
								176,865	8,488,522	4.8
Feb-14	35	4,500	250,082	5.6						
	224	158,243	10,464,053	6.6						
	355				105,955	7,341,754	6.9			
								143,638	6,065,761	4.2

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Mar-14	35	44,100	1,594,046	3.6						
	224	166,631	10,791,002	6.5						
	355				269,824	11,669,319	4.3			
								70,686	2,883,423	4.1
Apr-14	35	93,413	2,858,196	3.1						
	224	171,075	10,874,752	6.4						
	345	646	50,353	7.8						
	355				425,204	13,256,983	3.1			
								15,591	704,819	4.5
May-14	35	62,597	2,133,036	3.4						
	224	153,376	10,113,960	6.6						
	345	492	36,654	7.5						
	355				500,883	14,512,390	2.9			
	379	56,897	1,596,704	2.8						
								1,039	96,058	9.2
Jun-14	33	34,004	1,392,207	4.1						
	34	25,503	1,044,156	4.1						
	35	104,869	3,049,172	2.9						
	224	166,910	10,475,140	6.3						
	345	393	31,252	8.0						
	352	15	1,789	11.9						
	355				744,637	18,443,973	2.5			
	379	74,512	1,889,520	2.5						
								1,724	157,335	9.1
Jul-14	33	54,236	2,265,066	4.2						
	34	40,693	1,699,468	4.2						
	35	109,930	3,097,594	2.8						
	224	177,986	11,135,017	6.3						
	345	411	32,095	7.8						
	355				805,822	20,458,853	2.5			
	379	76,895	2,050,328	2.7						
								2,682	99,522	3.7
Aug-14	33	53,572	2,230,761	4.2						
	34	40,179	1,673,071	4.2						
	35	111,535	3,459,257	3.1						
	224	167,840	10,691,381	6.4						
	345	446	33,090	7.4						
	355				842,745	23,057,388	2.7			
	379	77,556	2,244,478	2.9						
								4,954	294,238	5.9
Sep-14	33	28,101	1,207,856	4.3						
	34	21,070	905,645	4.3						
	35	101,590	2,599,528	2.6						
	224	162,724	10,822,131	6.7						
	345	362	29,507	8.2						
	355				574,335	12,918,717	2.2			
	379	69,976	1,550,750	2.2						
								1,302	54,496	4.2

		FIRM			INTERRUPTIBLE			IMPORT		
Month	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
Oct-14	35	39,011	937,722	2.4						
	224	135,671	9,749,090	7.2						
	345									
	355				159,474	4,219,443	2.6			
	393	453	31,108	6.9						
								426	8,820	2.1
Nov-14	224	159,835	10,910,455	6.8						
	355				386,148	12,020,955	3.1			
	393	683	51,383	7.5						
								61,354	1,580,745	2.6
Dec-14	224	183,763	12,111,995	6.6						
	352	19	2,262	11.9						
	355				323,436	10,594,264	3.3			
	393	828	61,108	7.4						
								29,342	1,174,253	4.0

Table below is broken into Winter and Summer Season. Summer is considered to include the months of May to October. Winter includes April and November to March.

		FIRM			INTERRUPTIBLE			IMPORT		
Season	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
2008/09										
Winter	144	103,097	9,164,639	8.9						
	155	123,780	7,762,737	6.3						
	224	983,955	63,983,025	6.5						
	259	4,877	296,195	6.1						
	269				1,978,576	100,802,278	5.1			
								137,440	5,371,250	3.9
2008/09	33	176,300	6,446,081	3.7						
Summer	34	132,224	4,842,024	3.7						
	35	579,976	25,050,723	4.3						
	144	105,003	8,195,751	7.8						
	155	126,401	6,971,831	5.5						
	224	1,046,827	58,980,321	5.6						
	259	2,361	177,273	7.5						
	269				4,343,663	175,546,863	4.0			
								10,550	1,315,701	12.5
2009/10										
Winter	144	89,467	8,692,469	9.7						
	155	72,844	4,190,649	5.8						
	224	1,022,893	59,642,240	5.8						
	259	639	40,227	6.3						
	269				2,329,875	69,283,243	3.0			
	345	3,924	254,252	6.5						
								232,701	5,803,152	2.5
2009/10	33	413,740	10,090,810	2.4						
Summer	34	162,065	7,607,244	4.7						
	35	157,868	5,253,545	3.3						
	144	102,390	8,250,717	8.1						
	155	241,812	13,255,697	5.5						
	224	1,486,799	60,124,142	4.0						
	259	1,761	137,492	7.8						
	269				3,505,102	77,716,143	2.2			
	345	527	37,820	7.2						
								5,447	302,419	5.6
2010/11										
Winter	144	17,111	1,371,751	8.0						
	155	62,616	3,348,430	5.3						
	224	893,897	51,717,593	5.8						
	269				502,793	11,922,854	2.4			
	345	4,771	312,330	6.5						
	352	8	915	11.4						
	355				1,929,765	48,346,717	2.5			
								74,410	2,371,118	3.2
2010/11	33	176,029	6,696,920	3.8						
Summer	34	132,016	5,022,641	3.8						
	35	557,024	16,655,223	3.0						
	155	73,223	3,707,874	5.1						
	224	1,030,338	59,146,825	5.7						
	269				3,588,418	94,438,182	2.6			
	273	4	515	12.9						
	345	2,295	162,491	7.1						
								136,681	3,126,612	2.3

		FIRM			INTERRUPTIBLE			IMPORT		
Season	NEB Permit No.	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh	MWh	Revenue (CAN$)	¢/KWh
2011/12										
Winter	35	371,518	9,215,434	2.5						
	155	67,703	3,461,304	5.1						
	224	880,170	51,735,029	5.9						
	345	4,200	286,474	6.8						
	352	6	813	13.6						
	355				1,579,048	38,842,786	2.5			
								287,997	5,147,221	1.8
2011/12	33	174,323	6,248,999	3.6						
Summer	34	130,752	4,687,117	3.6						
	35	578,763	14,749,312	2.5						
	155	82,740	3,670,226	4.4						
	224	1,023,900	56,071,939	5.5						
	345	2,252	165,749	7.4						
	352	4	598	15.0						
	355				4,109,955	91,859,479	2.2			
								28,097	873,143	3.1
2012/13										
Winter	35	403,766	12,351,172	3.1						
	155	9,315	517,831	5.6						
	224	937,932	55,269,328	5.9						
	345	4,858	330,640	6.8						
	352	11	1,300	11.8						
	355				1,138,269	36,239,441	3.2			
								410,084	10,222,939	2.5
2012/13	33	173,318	6,490,430	3.7						
Summer	34	129,981	4,867,540	3.7						
	35	567,374	14,707,116	2.6						
	224	1,044,946	59,453,770	5.7						
	345	2,341	179,858	7.7						
	352	4	603	15.1						
	355				3,765,817	87,523,790	2.3			
								74,944	1,807,581	2.4
2013/14										
Winter	35	308,524	10,564,147	3.4						
	224	965,479	61,816,164	6.4						
	345	3,600	249,568	6.9						
	352	16	1,926	12.0						
	379	25,132	796,919	3.2						
	355				1,221,665	51,334,078	4.2			
								503,112	21,181,526	4.2
2013/14	33	168,713	6,711,698	4.0						
Summer	34	126,565	5,034,999	4.0						
	35	628,045	18,090,811	2.9						
	224	1,015,113	61,506,215	6.1						
	345	2,356	181,614	7.7						
	352	9	1,175	13.1						
	379	190,646	5,353,815	2.8						
	355				4,578,951	117,982,912	2.6			
								12,551	928,186	7.4

Chapter:	Tab 3	Page No.:	Appendix 11.20 MFR
Topic:	Export Revenue Forecasts		
Subtopic:	Firm & Opportunity Sales into MISO		
Issue:	NEB Data		

PREAMBLE TO IR (IF ANY):

MH's NEB reporting of MISO export sales do not indicate any upward trend in opportunity prices.

QUESTION:

a) Confirm or modify the attached graphical illustration of NEB prices

b) Confirm that License No. 224 will end in 2015 and the 500 MW sale replaced by a 375 MW (5x16 S) and a 325 MW (5x12 W) sales contract commencing in 2015/16

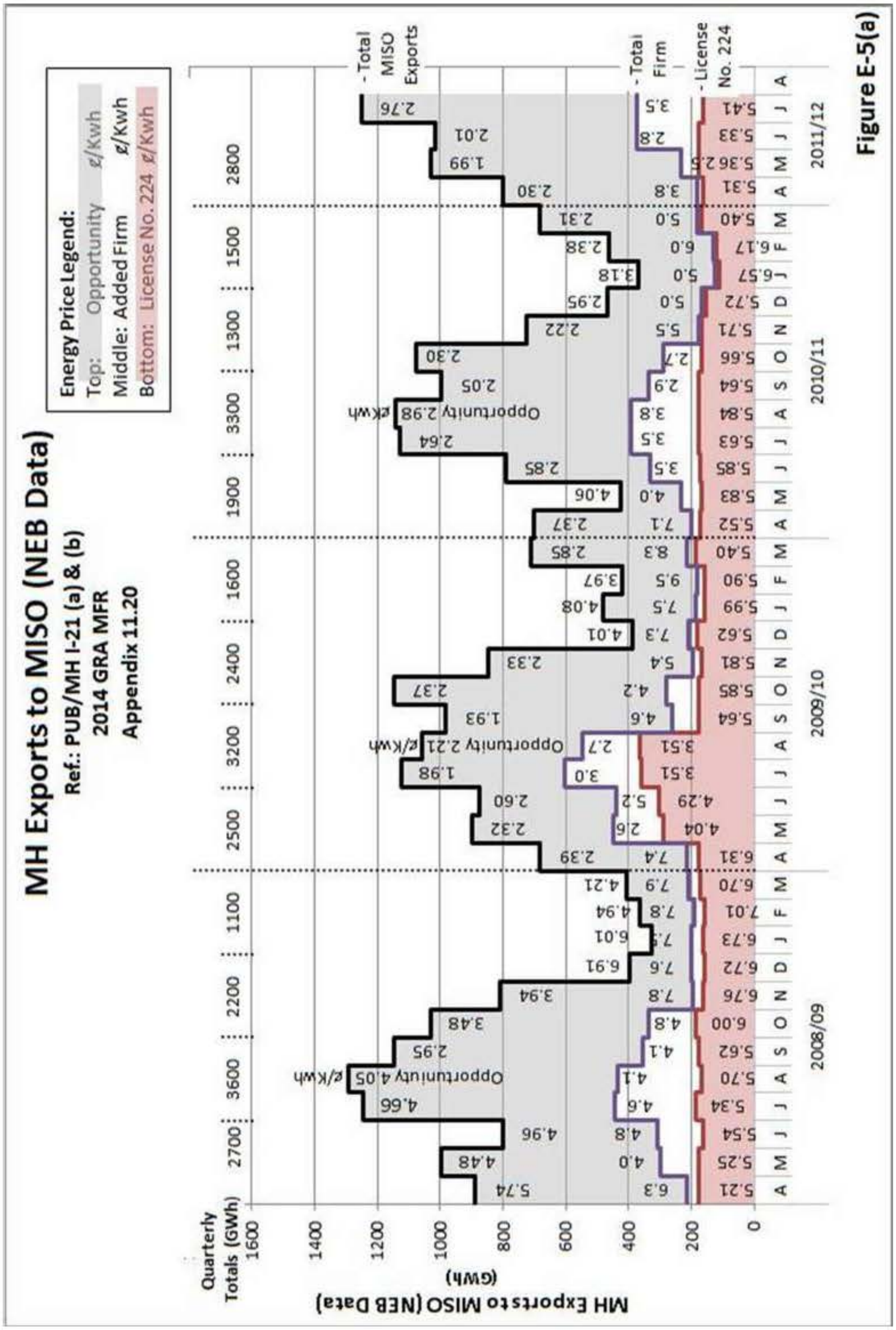
c) Provide the anticipated firm sales/prices/revenues that the new 345/325 NSP contract will achieve and be reported to NEB

RATIONALE FOR QUESTION:

MH's export sales profile has varied seasonally since 2008/09 but unit prices have remained at a depressed level to 2014/15 and possibly for the next few years.

RESPONSE:

RATIONALE FOR REFUSAL TO FULLY ANSWER THE QUESTION:


MH Exports to MISO (NEB Data)
Ref.: PUB/MH I-21 (a) & (b)
2014 GRA MFR
Appendix 11.20
Energy Price Legend:
Top: Opportunity ¢/Kwh
Middle: Added Firm ¢/Kwh
Bottom: License No. 224 ¢/Kwh
Quarterly Totals (GWh)
2700
3600
2200
1100
2500
3200
2400
1600
1900
3300
1300
1500
2800
MH Exports to MISO (NEB Data) (GWh)
- Total MISO Exports
- Total Firm
- License No. 224
Opportunity 4.05 ¢/Kwh
Opportunity 2.21 ¢/Kwh
Opportunity 2.98 ¢Kwh
2008/09
2009/10
2010/11
2011/12
Figure E-5(a)

Optional Applicant Logo

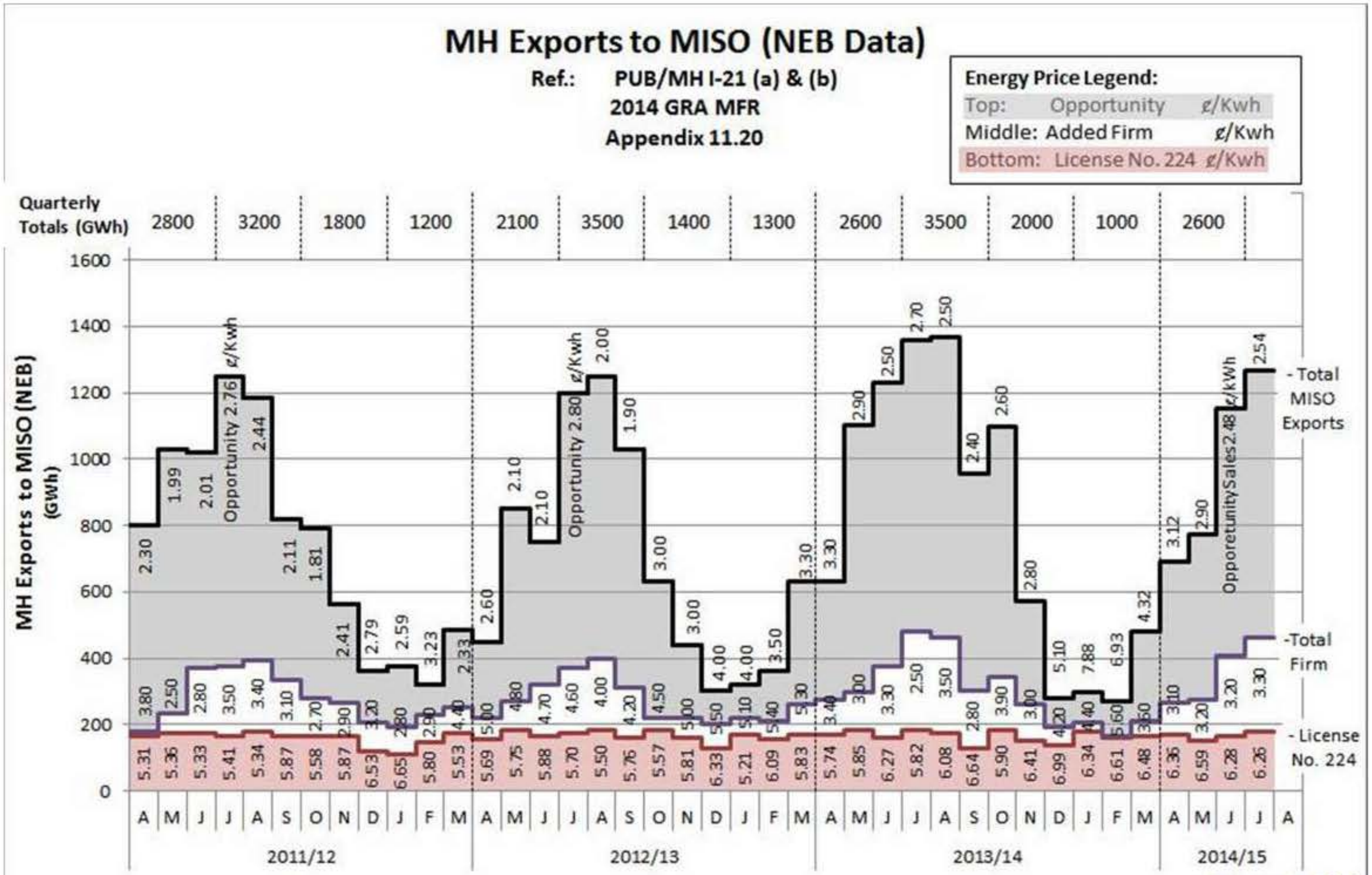


Figure E-5(b)

94

Optional Applicant Logo

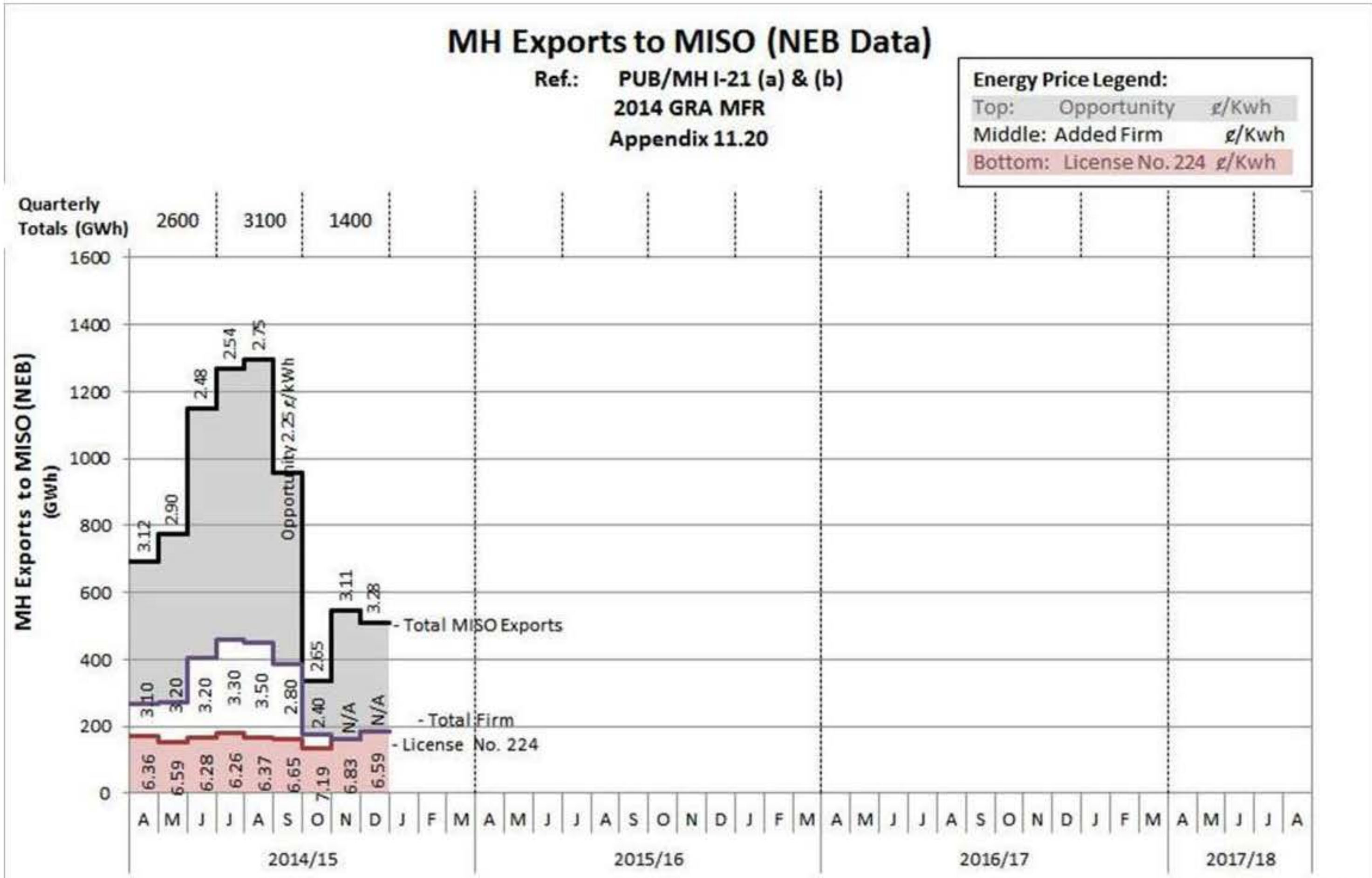


Figure E-5(c)

13

Section:	Tab 3, App. 3.3	**Page No.:**	Sect. 5, p.6
Topic:	Integrated Financial Forecast & Economic Outlook		
Subtopic:	Extra Provincial Revenue		
Issue:	Energy & Capacity Sales into the Export Market		

PREAMBLE TO IR (IF ANY):

Manitoba Hydro's Tab 3, App. 3.3 Section 5.0 listing of long term export contracts should equate to the Tab 9 (p. 7 of 23) listing of contracted exports:

2014/15 - 4537 GWh
2015/16 - 4051 GWh
2016/17 - 3406 GWh
2017/18 - 4339 GWh
2018/19 - 3282 GWh
2019/20 - 3192 GWh

QUESTION:

Re-file NFAT PUB/MH I – 017 (revised Dec/13) updated to Jan 2015 adding the monthly revenues to the sales volumes.

RATIONALE FOR QUESTION:

This Information Request seeks to reconcile listed export contracts with projected export revenues.

RESPONSE:

NFAT PUB/MH I-017 (revised Dec/13) has been updated to Jan 2015 adding the monthly revenues to the sales volumes.

	Diversity Sales		Diversity Purchases
	MWh	$CDN	MWh
Apr-02	0	0	156,369
May-02	6,470	189,235	28,570
Jun-02	48,400	2,135,635	22,358
Jul-02	49,150	1,737,612	33,436
Aug-02	38,250	983,391	25,800
Sep-02	55,285	2,012,323	25,841
Oct-02	21,750	729,261	32,276
Nov-02	0	0	62,795
Dec-02	0	0	52,749
Jan-03	0	0	54,154
Feb-03	0	0	62,729
Mar-03	0	0	76,677
Apr-03	0	0	44,380
May-03	0	0	0
Jun-03	66,445	2,885,752	300
Jul-03	166,627	8,107,053	0
Aug-03	139,891	6,656,928	0
Sep-03	26,930	1,162,354	0
Oct-03	0	0	0
Nov-03	0	0	0
Dec-03	0	0	8,250
Jan-04	0	0	9,445
Feb-04	0	0	10,025
Mar-04	0	0	0
Apr-04	0	0	0
May-04	0	0	0
Jun-04	55,840	2,640,363	0
Jul-04	165,384	8,808,073	0
Aug-04	176,792	8,985,257	0
Sep-04	42,452	1,804,960	0
Oct-04	0	0	0
Nov-04	0	0	7,000
Dec-04	0	0	8,475
Jan-05	0	0	9,600

	Diversity Sales		Diversity Purchases
	MWh	$CDN	MWh
Feb-05	0	0	9,275
Mar-05	0	0	6,000
Apr-05	0	0	0
May-05	0	0	0
Jun-05	65,448	3,252,999	0
Jul-05	157,186	7,936,880	0
Aug-05	143,900	5,884,283	0
Sep-05	55,820	1,906,545	0
Oct-05	18,450	428,707	0
Nov-05	0	0	9,550
Dec-05	0	0	21,675
Jan-06	0	0	8,200
Feb-06	0	0	11,825
Mar-06	0	0	5,600
Apr-06	0	0	0
May-06	10,250	581,600	0
Jun-06	43,600	1,550,675	0
Jul-06	106,544	4,847,336	0
Aug-06	130,750	5,255,960	0
Sep-06	28,320	1,054,458	0
Oct-06	0	0	0
Nov-06	0	0	700
Dec-06	0	0	5,625
Jan-07	0	0	4,650
Feb-07	0	0	10,200
Mar-07	0	0	1,125
Apr-07	0	0	750
May-07	63,368	3,856,843	0
Jun-07	111,500	5,347,234	0
Jul-07	208,410	9,198,857	0
Aug-07	225,216	9,470,461	0
Sep-07	103,292	3,768,045	0
Oct-07	91,371	3,153,373	0
Nov-07	0	0	0

	Diversity Sales		Diversity Purchases
	MWh	$CDN	MWh
Dec-07	0	0	0
Jan-08	0	0	0
Feb-08	0	0	0
Mar-08	0	0	0
Apr-08	150	0	0
May-08	81,574	3,401,427	0
Jun-08	108,009	4,599,426	0
Jul-08	220,250	10,071,543	0
Aug-08	226,500	9,286,960	0
Sep-08	140,567	4,835,748	0
Oct-08	111,450	4,153,724	0
Nov-08	0	0	0
Dec-08	0	0	3,892
Jan-09	0	0	6,426
Feb-09	0	0	0
Mar-09	0	0	1,230
Apr-09	0	0	0
May-09	134,821	2,145,938	0
Jun-09	160,149	4,470,598	0
Jul-09	211,201	5,184,966	0
Aug-09	232,839	5,668,885	0
Sep-09	49,369	1,685,485	0
Oct-09	77,706	2,358,613	0
Nov-09	0	0	11,550
Dec-09	0	0	38,549
Jan-10	0	0	49,820
Feb-10	0	0	20,150
Mar-10	0	0	0
Apr-10	0	0	0
May-10	53,700	1,842,176	0
Jun-10	149,196	5,095,974	0
Jul-10	205,825	7,101,662	0
Aug-10	207,604	7,658,888	0
Sep-10	140,725	3,854,088	0

	Diversity Sales		Diversity Purchases
	MWh	$CDN	MWh
Oct-10	108,019	2,626,733	0
Nov-10	0	0	0
Dec-10	0	0	14,250
Jan-11	0	0	12,000
Feb-11	0	0	0
Mar-11	0	0	0
Apr-11	0	0	0
May-11	42,927	761,934	0
Jun-11	180,055	4,723,817	0
Jul-11	199,484	6,860,638	0
Aug-11	200,750	6,509,329	0
Sep-11	152,591	4,302,713	0
Oct-11	108,181	2,342,694	0
Nov-11	91,354	2,321,519	0
Dec-11	73,016	2,086,927	0
Jan-12	70,101	1,685,321	0
Feb-12	68,150	1,666,184	8,079
Mar-12	68,747	1,455,483	19,276
Apr-12	55,841	1,221,903	0
May-12	76,063	2,221,192	0
Jun-12	159,385	4,985,737	0
Jul-12	197,478	6,889,944	0
Aug-12	207,048	6,089,883	0
Sep-12	151,701	3,780,881	0
Oct-12	83,118	2,206,126	0
Nov-12	67,050	1,927,256	0
Dec-12	61,875	2,123,564	1,050
Jan-13	66,150	2,181,518	0
Feb-13	66,150	2,076,848	0
Mar-13	86,700	2,820,083	0
Apr-13	103,820	3,357,126	0
May-13	111,440	3,163,406	0
Jun-13	165,276	5,259,685	0
Jul-13	216,975	7,613,270	0

	Diversity Sales		Diversity Purchases
	MWh	$CDN	MWh
Aug-13	207,118	7,193,147	0
Sep-13	116,409	3,562,896	0
Oct-13	106,105	3,045,102	0
Nov-13	83,290	2,287,598	0
Dec-13	52,414	2,191,692	3,150
Jan-14	20,400	883,602	48,415
Feb-14	4,500	250,082	93,300
Mar-14	44,100	1,594,046	46,050
Apr-14	93,413	2,858,195	4,500
May-14	62,597	2,133,036	0
Jun-14	164,376	5,485,535	0
Jul-14	209,834	7,269,900	0
Aug-14	205,286	7,363,089	0
Sep-14	150,761	4,713,029	0
Oct-14	39,011	937,722	0
Nov-14	0	0	0
Dec-14	0	0	0
Jan-15	0	0	0

14

Section:	Tab 3	Page No.:	
Topic:	Integrated Financial Forecast and Economic Outlook		
Subtopic:	MISO Export Contracts		
Issue:	Market Prices for Firm Contract Sales		

PREAMBLE TO IR (IF ANY):

In Appendix 11.20, MH's tabulation of monthly NEB transactions includes a Permit No. 379 Firm Summer Sale commencing in June of 2013 and carrying into 2014. This sale previously was reported as Interruptible.

QUESTION:

a) Where in Manitoba Hydro's list of contractual counterparties is this party disclosed?
b) What are the MW capacity and GWh energy involved?
c) Confirm that the sale attracts MISO market average energy prices with no explicit capacity revenue.
d) Explain the rationale for a contract that earns market price revenues.

RATIONALE FOR QUESTION:

To explore Manitoba Hydro's export revenue projections.

RESPONSE:

a) Permit 379 is in relation to the WPS 108 MW Surplus Energy Sale.

b) The WPS 108 MW Surplus Energy Sale is an energy sale only with an export volume up to 946 GWh annually.

c) Energy prices associated with specific contracts are considered to be confidential and as such, the information requested cannot be disclosed.

d) This energy sale requires WPS to hold firm MISO transmission to Wisconsin which increases Manitoba Hydro firm US market access. As indicated in c), the energy price associated with this contract is considered confidential and cannot be disclosed.

15

Table 5

TOTAL SALES									
	DEPENDABLE SALES			OPPORTUNITY SALES			SYSTEM MERCHANT SALES		
	GWh	CAD $M	AvgPrice	GWh	CAD $M	AvgPrice	GWh	CAD $M	AvgPrice
2005/06 Winter	1,805	107	59.39	4,320	219	49.34	505	31	54.78
2005/06 Summer	2,239	133	59.14	5,983	291	47.23	414	32	66.51
2006/07 Winter	1,654	103	62.51	1,503	79	51.16	573	29	45.12
2006/07 Summer	2,000	115	57.32	4,747	216	45.09	633	31	41.81
2007/08 Winter	1,548	87	56.02	2,254	126	53.49	636	39	53.24
2007/08 Summer	2,373	122	51.39	4,845	202	40.47	626	33	45.03
2008/09 Winter	1,537	100	64.81	1,769	93	48.78	719	38	48.36
2008/09 Summer	2,550	133	52.49	4,270	194	41.87	879	48	47.84
2009/10 Winter	1,383	83	59.73	2,696	79	30.07	359	13	30.96
2009/10 Summer	1,880	103	54.98	4,901	105	19.75	383	12	25.98
2010/11 Winter	1,248	70	55.9	2,762	66	23.58	275	10	33.20
2010/11 Summer	2,129	102	48.27	4,205	115	25.61	437	17	39.27
2011/12 Winter	1,592	78	49.14	1,892	47	23.43	118	5	22.37
2011/12 Summer	2,150	97	45.05	4,610	105	21.96	318	12	34.79
2012/13 Winter	1,544	79	51.35	1,416	46	31.48	61	3	33.46
2012/13 Summer	2,092	98	46.72	4,035	100	22.94	89	6	34.66
2013/14 Winter	1,426	82	57.65	1,539	62	40.73	202	28	80.90
2013/14 Summer	2,053	100	48.45	5,519	141	25.63	129	6	28.68
2014/15 Winter	665	41	61.94	1,331	44	31.87	168	5	35.49
2014/15 Summer	1,904	99	52.05	4,336	115	25.38	241	9	33.35
2014/15 is to end of Dec/14									

Table 6

TOTAL U.S. SALES									
	U.S. DEPENDABLE SALES			U.S. OPPORTUNITY SALES			U.S. SYSTEM MERCHANT SALES		
	GWh	CAD $M	AvgPrice	GWh	CAD $M	AvgPrice	GWh	CAD $M	AvgPrice
2005/06 Winter	1,805	107	59.39	3,704	178	47.87	0	0	0.00
2005/06 Summer	2,239	133	59.14	5,175	223	43.57	0	0	0.00
2006/07 Winter	1,654	103	62.51	1,415	70	51.07	0	0	0.00
2006/07 Summer	2,000	115	57.32	4,462	200	44.72	0	0	0.00
2007/08 Winter	1,548	87	56.02	2,107	112	53.45	0	0	0.00
2007/08 Summer	2,373	122	51.39	4,511	177	40.14	0	0	0.00
2008/09 Winter	1,537	100	64.81	1,603	77	48.20	0	0	0.00
2008/09 Summer	2,550	133	52.49	4,019	160	41.61	0	0	0.00
2009/10 Winter	1,383	83	59.73	2,571	72	29.14	0	0	0.00
2009/10 Summer	1,880	103	54.98	4,653	88	19.25	33	2	0.00
2010/11 Winter	1,248	70	55.9	2,290	50	22.83	3	0.2	37.82
2010/11 Summer	2,129	102	48.27	3,772	96	25.46	2	0.1	37.82
2011/12 Winter	1,592	78	49.14	1,399	29	21.03	36	0.3	30.29
2011/12 Summer	2,150	97	45.05	4,218	88	21.39	70	3	40.92
2012/13 Winter	1,544	79	51.35	999	29	27.92	23	1	30.62
2012/13 Summer	2,092	98	46.72	3,691	84	22.35	40	1	29.49
2013/14 Winter	1,426	82	57.65	1,155	49	38.60	71	3	35.25
2013/14 Summer	2,053	100	48.45	5,181	133	25.21	114	4	28.42
2014/15 Winter	665	41	61.94	1,086	35	29.89	163	6	34.24
2014/15 Summer	1,904	99	52.05	3,862	99	24.63	237	7	33.26
2014/15 is to end of Dec/14									

Table 7

OPPORTUNITY EXPORTS						
	On Peak GWh	Off Peak GWh	On Peak Avg Price (CAD$)	Off Peak Avg Price (CAD$)	On Peak Revenues (CAD $M)	Off Peak Revenues (CAD $M)
2005/06 Winter	1,330	2,991	67.91	41.20	94	124
2005/06 Summer	1,813	4,170	76.48	34.34	151	141
2006/07 Winter	462	1,040	66.44	44.62	32	46
2006/07 Summer	1,510	3,238	66.08	35.33	103	114
2007/08 Winter	715	1,540	67.42	46.48	53	73
2007/08 Summer	1,497	3,347	65.84	26.96	109	93
2008/09 Winter	524	1,244	71.42	38.14	43	49
2008/09 Summer	1,278	2,993	72.13	25.84	110	85
2009/10 Winter	973	1,724	34.80	26.96	34	45
2009/10 Summer	1,524	3,376	29.00	15.24	50	55
2010/11 Winter	887	1,873	28.86	20.89	26	41
2010/11 Summer	1,381	2,826	33.93	21.33	50	64
2011/12 Winter	609	1,257	26.92	21.59	19	28
2011/12 Summer	1,319	3,293	28.68	19.03	40	65
2012/13 Winter	653	754	32.83	30.32	22	24
2012/13 Summer	1,512	2,532	28.60	19.50	47	53
2013/14 Winter	650	887	45.18	37.34	27	39
2013/14 Summer	1,842	3,679	33.87	21.43	55	82
2014/15 Winter	429	796	38.59	27.85	22	22
2014/15 Summer	1,360	3,082	33.00	22.03	45	70

2014/15 is to end of Dec/14

16

<u>Export and Domestic Revenue MFR 4 (Revised)</u>

Re-file Dec 2013 Revised PUB/MH 1-008 (2014 Interim) updated to end of December 2014

- **Total Sales Data (CON/US/Merchant)**
- **Total MISO Sales (NEB Reporting)**
- **Opportunity Export tables, separately showing summer and winter components for each year**
- **Export Revenue tables showing Opportunity Bilateral, Day Ahead, Market, Real Time Market and Merchant Trading, separately showing summer and winter components for each year**
- **Fuel and Power purchases showing system merchant purchases, import power purchases (without wind), wind energy purchases & fuel purchases**
- **Transmission charges, separately showing summer and winter components for each year**

Information on total annual sales data and opportunity export sales can be found in Tab 9, Figures 9.6, 9.8 and 9.9. Information by season can be found in Tables 5 to 7 below. Information on NEB data on firm/interruptible exports by export permit number and imports can be found in the response to Domestic and Export Revenue MFR 3 and Appendix 9.1.

Information on annual export revenue, fuel and power purchases and transmission charges can be found in Tables 1 and 2. Information by season can be found in Tables 3 and 4 below.

Table 1

	EXPORT REVENUES														
	2010/11			2011/12			2012/13			2013/14			2014/15		
	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price
Opportunity															
Bilateral	1851	52	28.44	1923	50	26.02	1700	54	31.66	1471	53	36.07	1356	43	32.48
Market															
Day Ahead	3233	69	21.39	2720	52	18.68	2547	53	20.51	4251	109	25.77	3396	85	25.08
Real Time	1883	60	26.83	1859	50	23.24	1203	36	25.96	1336	32	30.94	915	25	26.18
Merchant	712	27	36.93	436	17	31.10	150	9	34.18	331	33	63.32	409	14	34.24

NOTE: 2014/15 is up to end of Dec 2014

Table 2

	Fuel and Power Purchased									
	2010/11		2011/12		2012/13		2013/14		2014/15	
	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)
System Merchant	712	24	436	14	150	6	331	19	409	11
Power Purchases	1154	34	1634	79	1584	71	1824	98	833	56
Transmission Charges		36		39		44		45		37
Fuel Purchases		12		14		12		14		6

NOTE: 2014/15 is up to end of Dec 2014

The tables below are split by season. Summer season consists of the months May to October. Winter season consists of the months April and November to March. The split was done this way so as to still tie to the fiscal year numbers provided previously.

Table 3

	EXPORT REVENUES																	
	2008/09			2009/10			2010/11			2011/12			2012/13			2013/14		
	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price
Opportunity Bilateral Winter	357	29	70.79	489	18	38.30	970	26	27.15	685	21	29.39	658	24	36.36	508	22	42.38
Opportunity Bilateral Summer	948	72	71.57	2139	42	19.95	881	26	29.87	1238	29	23.55	1042	30	28.65	963	31	32.67
Market Winter																		
Day Ahead	1087	41	37.80	1435	33	23.11	946	17	17.77	473	8	15.34	363	10	25.59	608	8	36.27
Real Time	322	20	53.81	771	32	32.17	846	23	25.59	734	18	22.44	393	10	27.66	422	13	45.51
Market Summer																		
Day Ahead	2953	81	27.58	1676	26	15.64	2287	52	22.88	2247	44	19.41	2184	43	19.56	3643	101	23.89
Real Time	368	40	48.31	1087	39	23.97	1037	37	27.76	1125	32	23.74	810	26	25.21	914	19	24.81
Merchant Winter	720	38	48.36	361	12	30.96	275	10	33.20	118	5	22.37	61	3	33.46	202	28	80.90
Merchant Summer	878	48	47.84	414	14	25.98	437	17	39.27	318	12	34.79	89	6	34.66	129	5	28.68

2014/15 is to end of Dec/14

Table 4

	Fuel and Power Purchased													
	2008/09		2009/10		2010/11		2011/12		2012/13		2013/14		2014/15	
	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)
System Merchant Winter	720	36	359	12	275	8	118	3	61	2	202	15	169	5
System Merchant Summer	878	44	416	13	437	16	318	11	89	4	129	4	240	6
Power Purchases Winter	575	40	833	27	494	17	906	43	942	43	1233	66	382	23
Power Purchases Summer	406	17	487	6	660	17	728	36	642	28	591	32	451	33
Transmission Charges Winter		13		16		16		18		19		20		10
Transmission Charges Summer		8		17		20		21		25		25		27
Fuel Purchases Winter		10		10		8		8		7		10		2
Fuel Purchases Summer		8		3		4		6		5		4		4

2014/15 is to end of Dec/14

Export and Domestic Revenue MFR 6

File updated 2012 GRA II-105 (PUB/MH II-105) quarterly report generation summaries.

The table below provides an update to PUB/MH-II-105(a) by including quarterly and annual energy supply information for 2012/13 through December 2014. Wind purchases information is provided separate from imports for all quarters except 2014/15 Q3 where the data is aggregated as required by confidentiality restrictions on Manitoba Hydro on the release of wind generation data.

	Actual Results (GWh)	Hydraulic Generation	Thermal Generation	Wind Purchases	Imports
2014/15	Q1	8437	4	233	28
	Q2	9119	11	187	12
	Q3	8393	14	374	
	Annual	25950	30	420	40
2013/14	Q1	8536	24	229	38
	Q2	9189	20	154	39
	Q3	8990	36	257	135
	Q4	8546	51	294	431
	Annual	**35261**	**131**	**933**	**643**
2012/13	Q1	7257	5	218	124
	Q2	9028	27	182	4
	Q3	8136	40	222	207
	Q4	8726	11	229	193
	Annual	**33147**	**83**	**851**	**528**

RESPONSE:

	Actual Results (GWh)	Thermal Generation	Wind Purchases	Imports
2014/15	Q1	4	233	28
	Q2	11	187	12
	Q3	14	278	96
	Q4	na	na	na
	Annual			

Information for the fourth quarter is not yet available, and cannot be publicly released until approximately mid-May 2015.

17

Section:	Tab 9, App. 9.1	**Page No.:**	pp. 4 to 6
Topic:	Energy Supply		
Subtopic:	Export Sales		
Issue:	NEB-MISO Sales- Timing/ Make-up of MISO sales		

PREAMBLE TO IR (IF ANY):

MH's MISO sales in 2014/15 as reported to the NEB break down as follows:

	Firm Contracts (GWh)	Non-firm 5x16 (GWh)	Non-firm 2x16 (GWh)	Non-firm 7x8 (GWh)	Total MISO Sales (GWh)
Apr	280③	350①	60	0	690
May	280③	350①	144	0	774
Jun	400③	230①	270	251	1151②
Jul	460③	170①	270	366	1266②
Aug	460③	170①	270	394	1294②
Sep	300③	330①	270	58	958
Oct	180	160	0	0	340
Nov	160	390	0	0	550
Dec (forecast)	170	150④	0	0	270
Jan (forecast)	170	150④	0	0	270
Feb (forecast)	150	150④	0	0	250
Mar (forecast)	170	150④	0	0	270

① MH apparently achieved 100% of 5x16 US tie-line capacity.
② MH apparently achieved 90% of the 7x24 US-Intertie line capacity.
③ Includes Diversity Sales with zero capacity revenue
④ May include bilateral opportunity sales

QUESTION:

Confirm or revise the breakdown of MISO energy sales in the above table.

RATIONALE FOR QUESTION:

To assess the types of sales Manitoba Hydro can achieve in MISO.

RESPONSE:

Manitoba Hydro cannot confirm the information in the table provided. Information provided to the NEB as required by its export permits is not sales data, rather it is energy that is sourced in Canada for physical export to the US using the appropriate NEB permit. US sales are routinely greater than delivery as sales can be sourced from energy purchased in the US. As these sales are not sourced in Canada, they are not reported to the NEB as exports from Canada.

In addition the question assumes that all sales are MISO sales. This is incorrect in that MISO sales are only a portion of MH's total US sales. Lastly the question assumes that Diversity Sales were reported to the NEB as Interruptible Sales. Rather Diversity Sales are reported to the NEB under the NEB Diversity Agreement firm export permits.

Below is the revised breakdown of the US energy sales based on the NEB breakdown provided in Tab 9, App. 9.1.

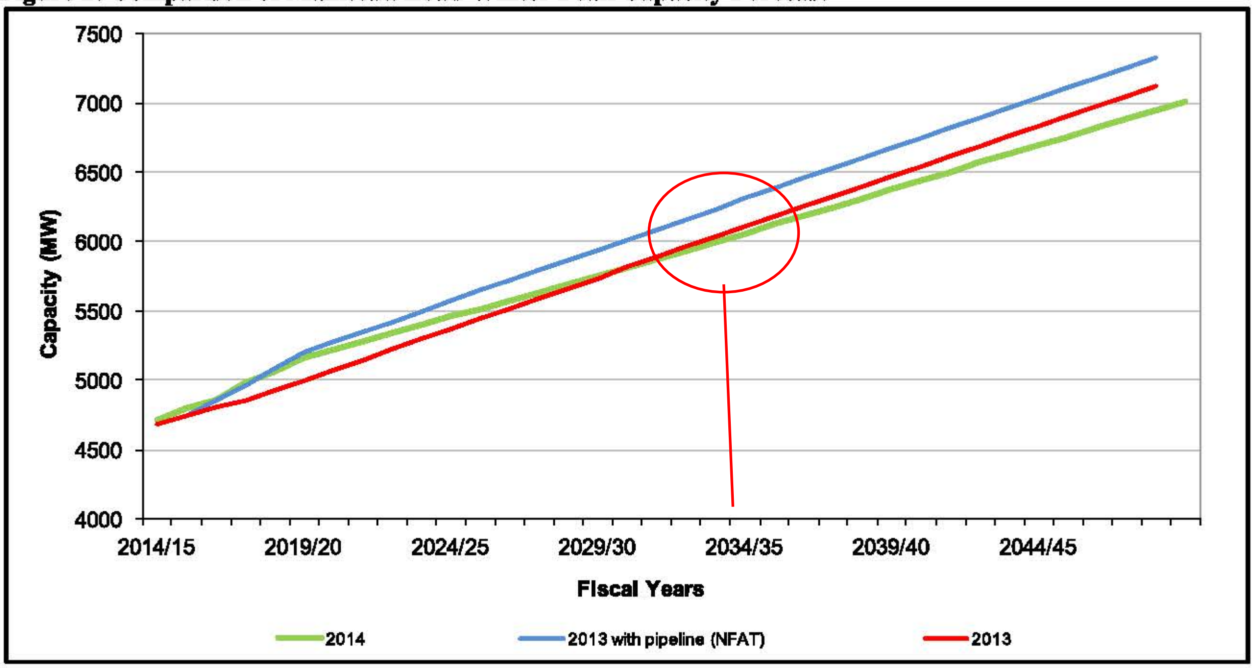
The data provided in the table below is based on actual deliveries for 2014/15.

	On-Peak		Off-Peak	
	Firm Contracts GWh	Non Firm 5 x 16 GWh	Non Firm 2 x 16 GWh	Non Firm 7 x 8 GWh
April	264	182	132	112
May	273	159	146	195
June	406	238	187	320
July	460	232	201	373
August	451	206	239	398
September	383	181	141	253
October	182	30	43	87
November	160	126	111	150
December	184	106	114	103
January	176	118	102	73
February	160	49	27	15
March	176	168	119	142

18

As shown in Figure 2, the 2014 Gross Total Peak demand forecast for 2032/33 is down 28 MW compared to the 2013 Load Forecast, less than a half a year of load growth. (1 year = approximately 70 MW). The 2014 load forecast is lower than that provided during the NFAT process due to a decrease in forecasted Top Consumers in the pipeline sector and lower residential customer forecast due to increased codes and standards.

Figure 2: Comparison of Manitoba Load Winter Peak Capacity Forecast



3.2 Demand Side Management

Incremental demand side management (DSM) included in the 2014/15 Power Resource Plan is 582 MW and 2797 GW.h achieved by 2028/29. This is a significant increase from the 2013 PRP (which included 166 MW and 773 GW.h achieved by 2027/28) based on an in-depth review of the market. Incremental DSM included in the Power Resource Plan excludes savings already achieved to date, savings achieved through codes and standards which are included in the Load Forecast, and savings from curtailable rates programming that do not qualify as winter peak capacity or dependable energy.

The forecast submitted for the NFAT analysis included future code savings anticipated to arise through efforts under the commercial New Buildings Program. With the recent Manitoba adoption of the National Energy Code for Buildings, the future energy impacts from these codes have been re-allocated from the Demand Side Management forecast under the 2014 Power Resource Plan and are now reflected in the 2014 Load Forecast due to the formal code implementation in the new construction market.

Figures 3 and 4 show the changes in demand side management assumptions for energy and capacity between the 2013/14 Power Resource Plan, the 2013 NFAT Level 2 DSM, and the 2014/15 Power Resource Plan.

Figure 3: Comparison of DSM Energy Forecasts

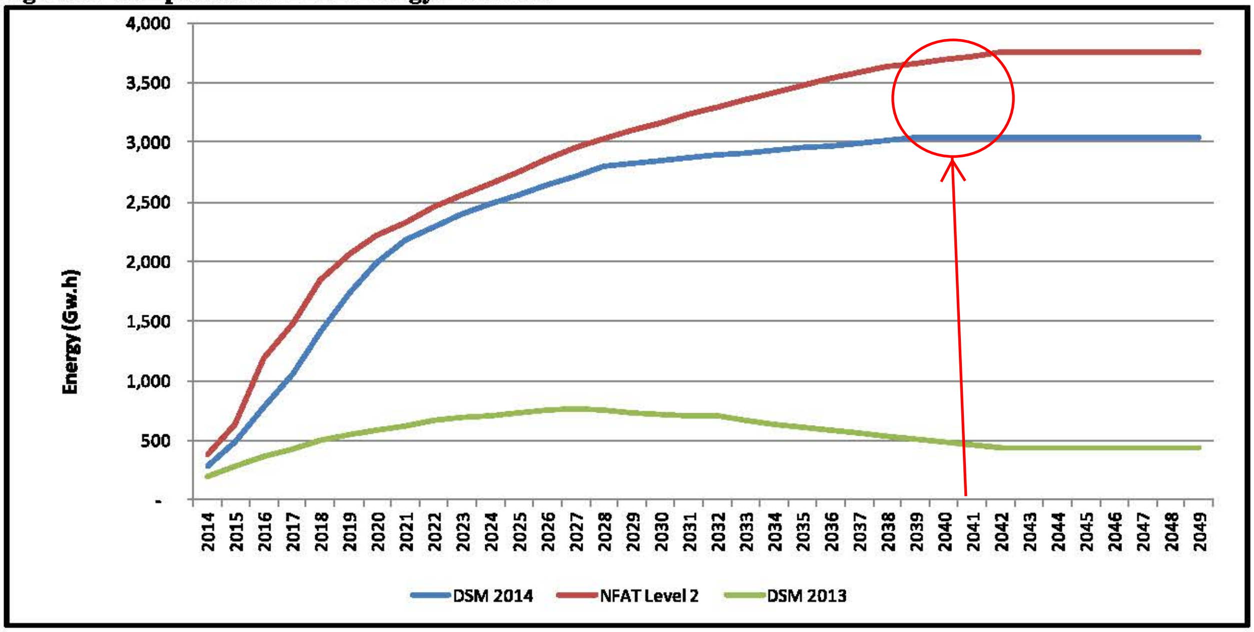
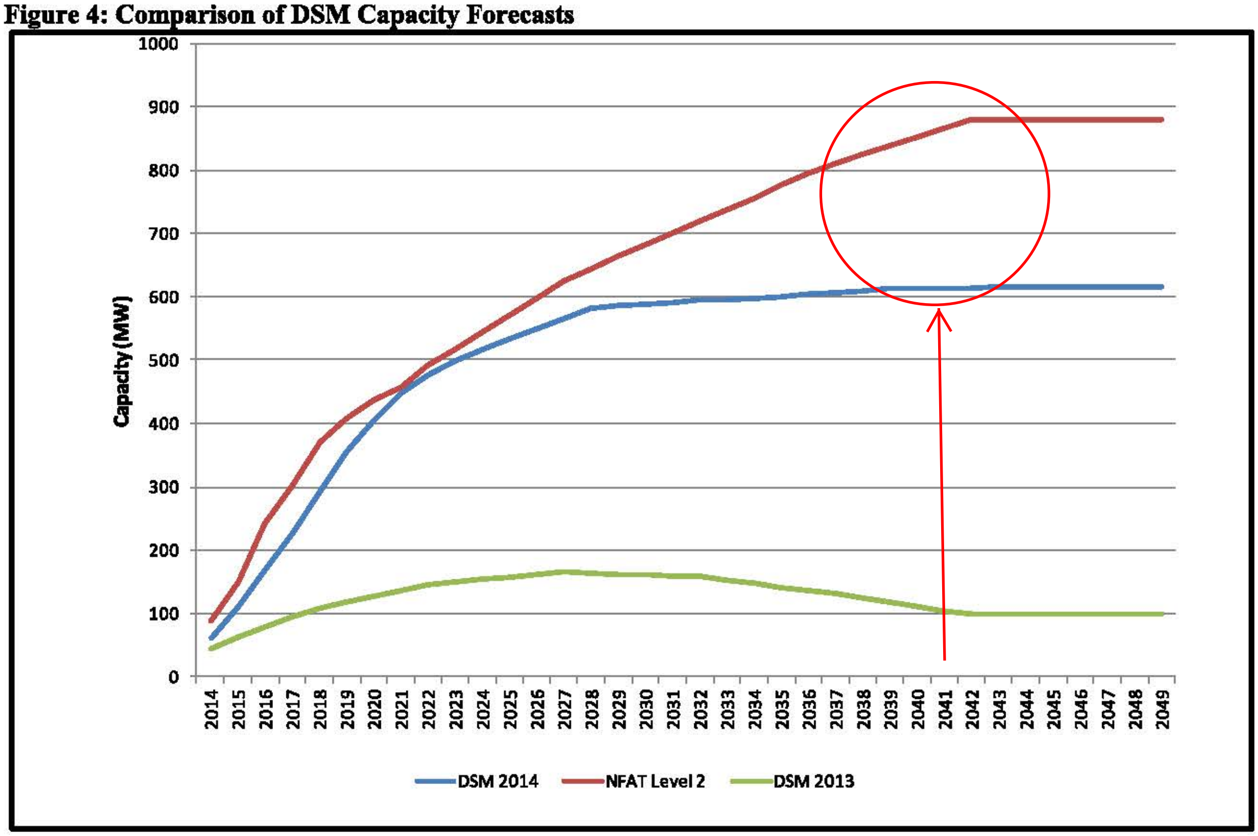


Figure 4: Comparison of DSM Capacity Forecasts



19

Electric Operations 50% DSM Programs & Savings
Projected Operating Statement
(In Millions of Dollars)

For the year ended March 31	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
REVENUES										
General Consumers Revenue at approved rates	1 617	1 633	1 649	1 665	1 681	1 698	1 716	1 734	1 753	1 772
Additional General Consumers Revenue	765	868	976	1 090	1 210	1 338	1 473	1 553	1 637	1 723
BPIII Reserve Account	-	-	-	-	-	-	-	-	-	-
Extraprovincial	913	840	849	824	817	863	848	816	813	810
Other	16	17	17	18	18	18	19	19	19	20
	3 312	3 358	3 491	3 596	3 726	3 918	4 056	4 123	4 222	4 325
EXPENSES										
Operating and Administrative	644	657	669	683	696	705	725	739	761	776
Finance Expense	1 331	1 324	1 311	1 309	1 290	1 262	1 217	1 161	1 122	1 092
Depreciation and Amortization	746	757	770	784	793	804	816	838	852	878
Water Rentals and Assessments	133	132	133	133	134	138	138	137	137	137
Fuel and Power Purchased	288	286	295	297	306	301	332	353	386	406
Capital and Other Taxes	161	162	163	164	166	168	170	172	175	176
Corporate Allocation	8	8	8	8	8	6	5	6	5	5
	3 313	3 330	3 352	3 382	3 396	3 388	3 406	3 410	3 442	3 475
Non-Controlling Interest	(5)	(2)	(3)	(5)	(6)	(10)	(12)	(15)	(17)	(19)
Net Income	(6)	27	136	209	324	520	637	698	763	831
* Additional General Consumers Revenue										
Percent Increase	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	2.00%	2.00%	2.00%
Cumulative Percent Increase	47.31%	53.13%	59.18%	65.47%	72.01%	78.80%	85.86%	89.58%	93.37%	97.24%
Financial Ratios										
Debt Ratio	89	89	88	87	86	84	81	79	76	72
Interest Coverage Ratio	1.00	1.02	1.10	1.16	1.25	1.40	1.51	1.58	1.65	1.74
Capital Coverage Ratio	1.31	1.36	1.53	1.64	1.75	2.09	2.16	2.26	2.33	2.43

ELECTRIC OPERATIONS (MH14)
PROJECTED OPERATING STATEMENT
(In Millions of Dollars)

For the year ended March 31	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
REVENUES										
General Consumers										
at approved rates	1,551	1,565	1,580	1,593	1,607	1,624	1,641	1,659	1,677	1,696
additional*	734	832	935	1,043	1,157	1,280	1,409	1,486	1,566	1,649
BPIII Reserve Account	0	0	0	0	0	0	0	0	0	0
Extraprovincial	996	928	944	921	920	927	911	901	883	884
Other	16	17	17	18	18	18	19	19	19	20
	3,298	3,342	3,475	3,575	3,702	3,849	3,980	4,065	4,145	4,248
EXPENSES										
Operating and Administrative	644	657	669	683	697	706	719	733	748	763
Finance Expense	1,351	1,348	1,338	1,337	1,321	1,301	1,263	1,197	1,161	1,116
Depreciation and Amortization	767	780	791	804	811	820	831	842	857	873
Water Rentals and Assessments	133	132	133	133	134	134	135	135	136	137
Fuel and Power Purchased	278	275	283	283	291	302	307	317	320	333
Capital and Other Taxes	162	163	164	165	166	167	168	170	173	174
Corporate Allocation	8	8	8	8	8	6	5	6	5	5
Other Expenses	3	2	2	2	2	2	3	3	3	3
	3,346	3,365	3,388	3,415	3,430	3,439	3,432	3,403	3,403	3,404
Non-controlling Interest	(5)	(2)	(3)	(5)	(6)	(10)	(12)	(15)	(17)	(19)
Net Income	(53)	(24)	84	155	266	400	536	647	725	826
* Additional General Consumers Revenue										
Percent Increase	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	2.00%	2.00%	2.00%
Cumulative Percent Increase	47.31%	53.13%	59.18%	65.47%	72.01%	78.80%	85.86%	89.58%	93.37%	97.24%

Electric Operations 50% DSM Programs & Savings
Projected Balance Sheet
(In Millions of Dollars)

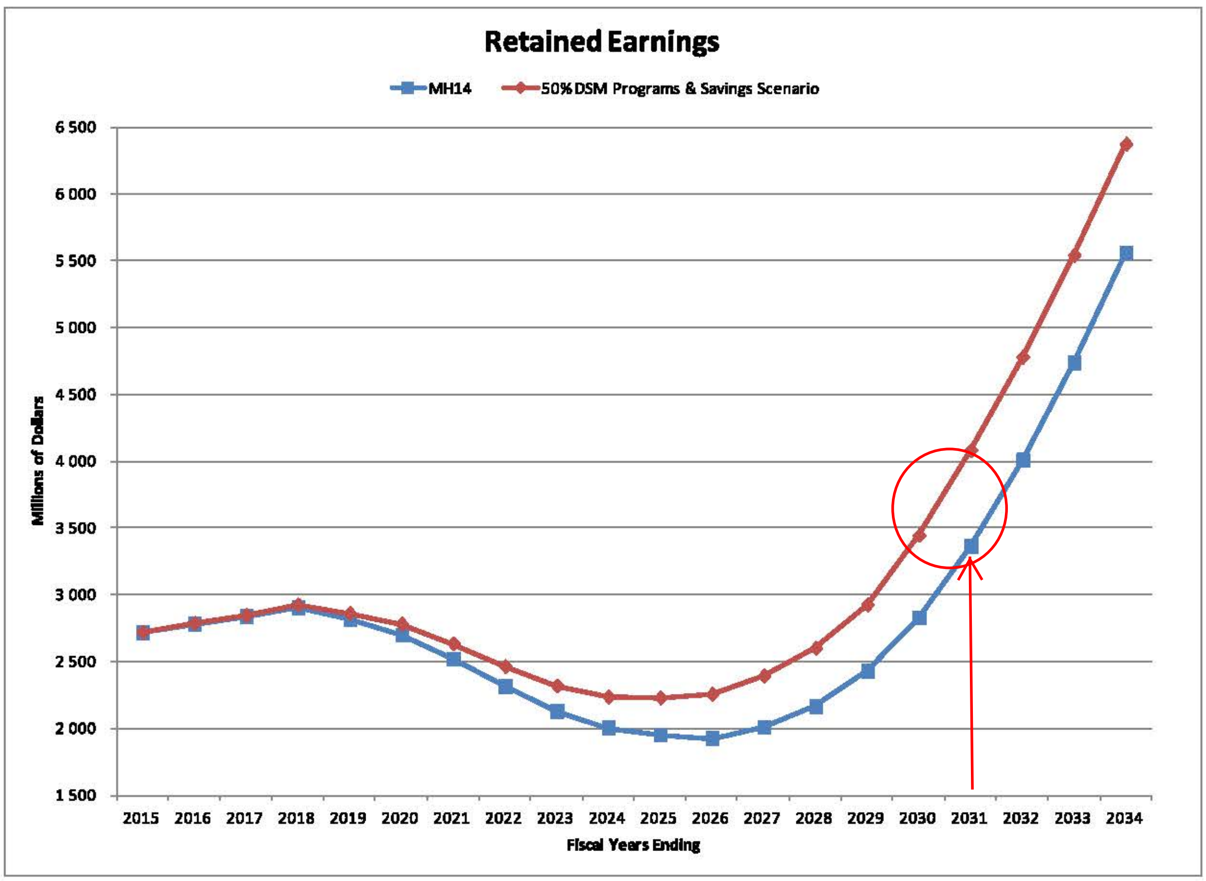
For the year ended March 31	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
ASSETS										
Plant in Service	35 822	36 544	37 410	38 124	38 859	39 555	40 581	41 337	42 409	43 537
Accumulated Depreciation	(11 096)	(11 807)	(12 532)	(13 274)	(14 030)	(14 800)	(15 585)	(16 394)	(17 219)	(18 069)
Net Plant in Service	24 725	24 737	24 878	24 849	24 828	24 754	24 997	24 943	25 190	25 468
Construction in Progress	322	344	225	254	379	572	472	663	465	255
Current and Other Assets	2 383	2 532	2 778	3 120	3 301	3 623	3 436	4 003	4 689	5 457
Goodwill and Intangible Assets	107	93	80	68	57	45	34	23	11	(0)
Regulated Assets	266	254	243	231	223	220	218	221	226	231
	27 802	27 960	28 204	28 521	28 788	29 215	29 156	29 852	30 582	31 411
LIABILITIES AND EQUITY										
Long Term Debt	22 995	23 598	23 801	23 943	23 876	23 149	23 139	23 143	23 137	22 781
Current and Other Liabilities	2 121	1 611	1 479	1 408	1 380	1 976	1 251	1 207	1 140	1 454
Contributions in Aid of Construction	764	802	839	876	914	952	990	1 029	1 069	1 109
BPIII Reserve Account	-	-	-	-	-	-	-	-	-	-
Retained Earnings	2 227	2 253	2 389	2 598	2 922	3 442	4 079	4 777	5 540	6 371
Accumulated Other Comprehensive Income	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)
	27 802	27 960	28 204	28 521	28 788	29 215	29 156	29 852	30 582	31 411

ELECTRIC OPERATIONS (MH14)
PROJECTED BALANCE SHEET
(In Millions of Dollars)

For the year ended March 31	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
ASSETS										
Plant in Service	35,822	36,544	37,410	38,124	38,859	39,555	40,294	41,050	41,823	42,952
Accumulated Depreciation	(11,096)	(11,807)	(12,532)	(13,274)	(14,030)	(14,800)	(15,585)	(16,384)	(17,200)	(18,031)
Net Plant in Service	24,725	24,737	24,878	24,849	24,828	24,754	24,710	24,666	24,623	24,921
Construction in Progress	322	344	225	254	277	323	365	402	465	255
Current and Other Assets	2,387	2,536	2,801	3,049	3,421	3,773	3,629	4,288	4,963	5,703
Goodwill and Intangible Assets	107	93	80	68	57	45	34	23	11	(0)
Regulated Assets	374	353	333	313	300	295	293	296	304	311
	27,914	28,063	28,316	28,533	28,884	29,191	29,030	29,675	30,366	31,189
LIABILITIES AND EQUITY										
Long-Term Debt	23,395	24,198	24,401	24,343	24,476	23,749	23,739	23,743	23,737	23,381
Current and Other Liabilities	2,112	1,443	1,373	1,456	1,372	1,968	1,243	1,199	1,132	1,446
Contributions in Aid of Construction	764	802	839	876	914	952	990	1,029	1,069	1,109
BPIII Reserve Account	-	-	-	-	-	-	-	-	-	-
Retained Earnings	1,948	1,924	2,007	2,161	2,427	2,826	3,361	4,008	4,732	5,557
Accumulated Other Comprehensive Income	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)
	27,914	28,063	28,316	28,533	28,884	29,191	29,030	29,675	30,366	31,189

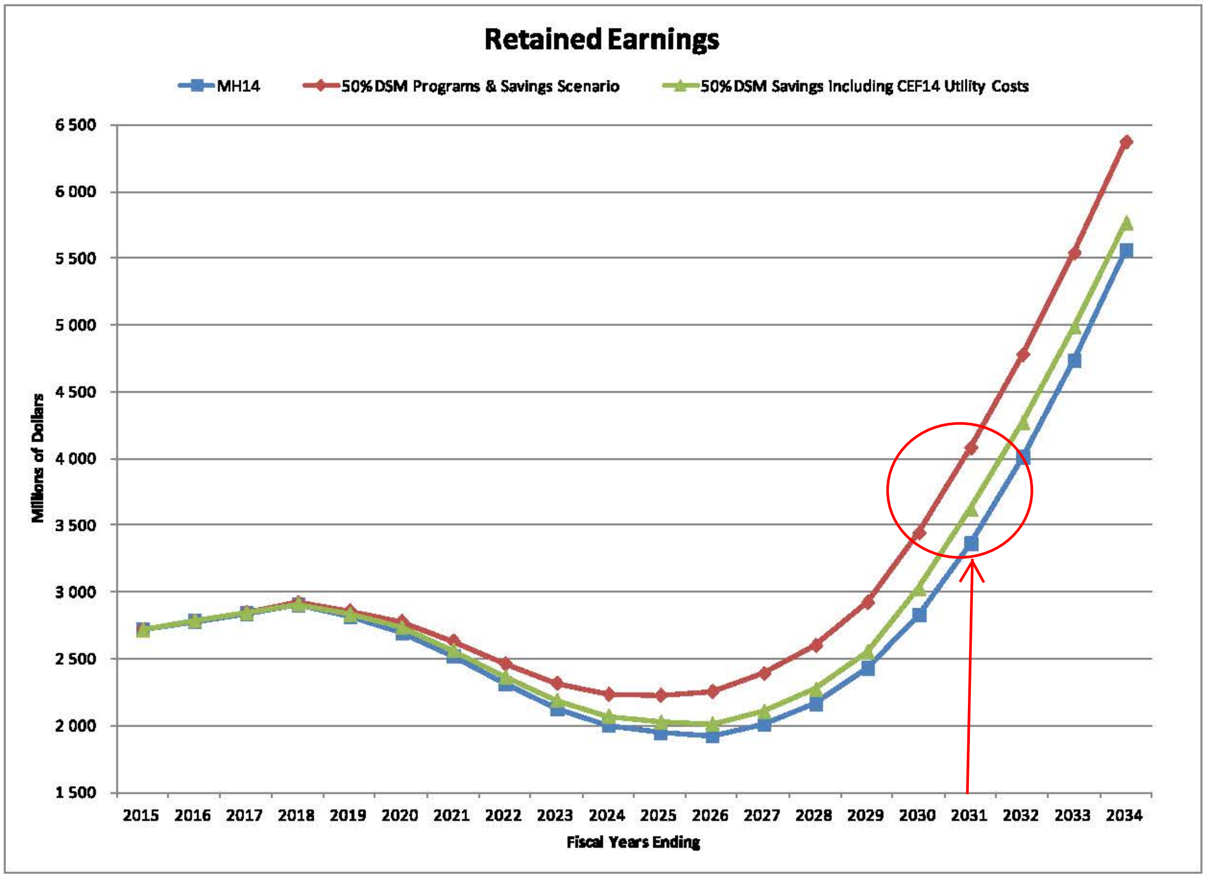
- The reduction in DSM savings results in less energy available for export and reduces projected net export revenue (net of water rentals and fuel and power purchased) by $1.5 billion over the period to 2033/34 compared to MH14.

The following figure shows the retained earnings under MH14 and the 50% DSM programs and savings scenario over the forecast period to 2033/34. The 50% DSM programs and savings scenario results in cumulative projected losses of $694 million over the six year period 2018/19 to 2023/24 compared to $978 million in cumulative losses over the eight year period 2018/19 to 2025/26 in MH14.



An alternative scenario has been prepared with the same assumptions as noted above except that the DSM utility costs are the same as CEF14. This scenario shows the financial impacts of Manitoba Hydro's investment in more aggressive DSM but do not result in the projected savings or customer uptake.

The following figure shows the projected retained earnings of the alternate DSM savings scenario assuming the same utility costs as CEF14 compared to MH14 and the DSM 50% programs and savings scenario.



Projected retained earnings are approximately $200 million higher compared to MH14 due to the shift in energy from export sales to domestic sales and partially offset by the incremental operating and carrying costs for the additional generation required to meet domestic load in 2030/31 and 2032/33. This scenario results in projected cumulative net losses of $898 billion over the eight year period 2018/19 to 2025/26.

Mathematically, the even annual rate increase under the DSM savings scenarios may be reduced from MH14's projected 3.95% rate increases from 2015/16 to 2030/31 to 3.83% and 3.92%, respectively (assumes the 2.0% rate increases 2031/32 to 2033/34 remain the same under both scenarios). However, a reduction to even annual rate increases only serves to increase the cumulative losses projected under both these DSM savings scenarios increasing the risk of rate instability for customers. The proposed and projected 3.95% rate increases are the minimum required to maintain Manitoba Hydro's financial strength and affordable, predictable rates for customers.

The projected financial statements for the DSM 50% program and savings scenario and the alternate DSM 50% savings scenario including the CEF14 utility costs are attached.

20

APPENDIX

A. DEPENDABLE SUPPLY & DEMAND

System Firm Winter Peak Demand and Capacity Resources (MW) @ generation
2014/15 PRP
No New Resources

Fiscal Year		2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa																			
Keeyask							90	630	630	630	630	630	630	630	630	630	630	630	630
1 **Total New Hydro**							90	630	630	630	630	630	630	630	630	630	630	630	630
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New NUG PPA																			
Contracted																			
Proposed				12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
3 **Total New NUG PPA**				12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4 **Total New Power Resources**	1+2+3			**12**	**12**	**12**	**102**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**
Base Supply Power Resources																			
Existing Hydro		5 133	5 172	5 164	5 190	5 195	5 196	5 181	5 172	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167
Existing Thermal																			
Brandon Coal - Unit 5		105	105	105	105	105													
Selkirk Gas			66	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Brandon Units 6-7 SCGT		280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
Contracted Imports		605	605	605	605	605	605	605	605	605	605	605	220	220	220	220	220		
Proposed Imports																			
Pointe du Bois Rebuild																			
Bipole III Reduced Losses						90	90	80	80	80	80	80	80	80	80	80	80	80	80
5 **Total Base Supply Power Resources**		**6 123**	**6 228**	**6 286**	**6 312**	**6 407**	**6 303**	**6 278**	**6 269**	**6 264**	**6 264**	**6 264**	**5 879**	**5 879**	**5 879**	**5 879**	**5 879**	**5 659**	**5 659**
6 **Total Power Resources**	4+5	**6 123**	**6 228**	**6 298**	**6 324**	**6 419**	**6 405**	**6 920**	**6 911**	**6 906**	**6 906**	**6 906**	**6 521**	**6 521**	**6 521**	**6 521**	**6 521**	**6 301**	**6 301**
Peak Demand																			
2014 Base Load Forecast		4 716	4 803	4 861	4 985	5 068	5 166	5 223	5 284	5 342	5 400	5 458	5 516	5 574	5 632	5 690	5 748	5 808	5 869
Less: 2014 DSM Forecast		- 60	- 111	- 169	- 226	- 293	- 353	- 406	- 449	- 475	- 498	- 517	- 533	- 550	- 566	- 582	- 585	- 589	- 592
7 **Manitoba Net Load**		4 656	4 692	4 692	4 759	4 775	4 813	4 817	4 835	4 867	4 902	4 941	4 983	5 024	5 066	5 108	5 163	5 219	5 277
Contracted Exports		726	484	724	724	559	559	779	908	880	880	880	385	385	275	275	275	275	275
Proposed Exports																			
8 **Total Exports**		726	484	724	724	559	559	779	908	880	880	880	385	385	275	275	275	275	275
9 **Total Peak Demand**	7+8	**5 382**	**5 176**	**5 416**	**5 483**	**5 334**	**5 372**	**5 596**	**5 743**	**5 747**	**5 782**	**5 821**	**5 368**	**5 409**	**5 341**	**5 383**	**5 438**	**5 494**	**5 552**
10 Reserves		513	563	563	571	573	577	578	580	584	588	593	598	603	608	613	620	626	633
11 **System Surplus**	6-9-10	**228**	**489**	**319**	**270**	**512**	**456**	**746**	**588**	**575**	**536**	**492**	**555**	**509**	**572**	**525**	**463**	**181**	**116**

System Firm Winter Peak Demand and Capacity Resources (MW) @ generation
2014/15 PRP
No New Resources

Fiscal Year		2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa																			
Keeyask		630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630
1 **Total New Hydro**		630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New NUG PPA																			
Contracted																			
Proposed		12	12	12	12														
3 **Total New NUG PPA**		12	12	12	12														
4 **Total New Power Resources**	1+2+3	642	642	642	642	630	630	630	630	630	630	630	630	630	630	630	630	630	630
Base Supply Power Resources																			
Existing Hydro		5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167
Existing Thermal																			
Brandon Coal - Unit 5																			
Selkirk Gas		132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Brandon Units 6-7 SCGT		280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
Contracted Imports																			
Proposed Imports																			
Pointe du Bois Rebuild									87	87	87	87	87	87	87	87	87	87	87
Bipole III Reduced Losses		80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
5 **Total Base Supply Power Resources**		5 659	5 659	5 659	5 659	5 659	5 659	5 659	5 746	5 746	5 746	5 746	5 746	5 746	5 746	5 746	5 746	5 746	5 746
6 **Total Power Resources**	4+5	6 301	6 301	6 301	6 301	6 289	6 289	6 289	6 376	6 376	6 376	6 376	6 376	6 376	6 376	6 376	6 376	6 376	6 376
Peak Demand																			
2014 Base Load Forecast		5 931	5 995	6 058	6 122	6 185	6 249	6 313	6 376	6 440	6 504	6 567	6 631	6 694	6 758	6 822	6 885	6 949	7 012
Less: 2014 DSM Forecast		- 594	- 596	- 598	- 601	- 604	- 607	- 610	- 613	- 614	- 614	- 615	- 615	- 615	- 615	- 615	- 615	- 615	- 615
7 **Manitoba Net Load**		5 337	5 399	5 460	5 521	5 581	5 642	5 703	5 763	5 826	5 890	5 952	6 016	6 079	6 143	6 207	6 270	6 334	6 397
Contracted Exports		275	275	275															
Proposed Exports																			
8 **Total Exports**		275	275	275															
9 **Total Peak Demand**	7+8	5 612	5 674	5 735	5 521	5 581	5 642	5 703	5 763	5 826	5 890	5 952	6 016	6 079	6 143	6 207	6 270	6 334	6 397
10 Reserves		640	648	655	663	670	677	684	692	699	707	714	722	729	737	745	752	760	768
11 **System Surplus**	6-9-10	49	- 21	- 89	117	38	- 30	- 98	- 79	- 149	- 221	- 290	- 362	- 432	- 504	- 576	- 646	- 718	- 789

System Firm Energy Demand and Dependable Resources (GWh) @ generation
2014/15 PRP
No New Resources

Fiscal Year		2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa																			
Keeyask							493	2 974	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003
1 **Total New Hydro**							**493**	**2 974**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New Nug PPA																			
Contracted																			
Proposed				97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97
3 **Total New Nug PPA**				**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**
4 New Wind																			
5 **Total New Power Resources**	1+2+3+4			**97**	**97**	**97**	**590**	**3 071**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**
Base Supply Power Resources																			
Existing Hydro		21 928	21 924	21 892	21 878	21 880	21 863	21 816	21 775	21 743	21 743	21 733	21 723	21 723	21 713	21 703	21 703	21 693	21 693
Existing Thermal																			
Brandon Coal - Unit 5		811	811	811	811	811	592												
Selkirk Gas		953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
Brandon Units 6-7 SCGT		2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354
Contracted Imports		2 730	2 485	2 575	2 575	2 575	2 575	3 502	3 688	3 688	3 688	3 688	2 321	2 050	2 050	2 050	2 050	1 268	1 113
Proposed Imports																			
Hydro Adjustment		373	784	844	844	844	844	844	844	844	844	844	406	307	307	307	307	70	
Market Purchases		337	583	493	493	493	493	958	1 050	1 050	1 050	1 050	2 417	2 671	2 283	2 226	2 259	2 911	3 100
Existing Wind		771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771
Pointe du Bois Rebuild																			
Bipole III Reduced Losses						101	101	177	177	177	177	177	177	177	177	177	177	177	177
6 **Total Base Supply Power Resources**		**30 257**	**30 665**	**30 693**	**30 679**	**30 782**	**30 546**	**31 375**	**31 612**	**31 580**	**31 580**	**31 570**	**31 122**	**31 006**	**30 608**	**30 541**	**30 574**	**30 197**	**30 161**
7 **Total Power Resources**	5+6	**30 257**	**30 665**	**30 789**	**30 775**	**30 878**	**31 135**	**34 446**	**34 712**	**34 680**	**34 680**	**34 670**	**34 221**	**34 105**	**33 707**	**33 640**	**33 673**	**33 297**	**33 261**
Manitoba Domestic Load																			
2014 Base Load Forecast		25 639	26 130	26 436	27 174	27 662	28 247	28 583	28 937	29 284	29 626	29 970	30 316	30 659	31 006	31 352	31 703	32 061	32 424
Construction Power - Hydro			110	110	110	110	110	83											
Less: 2014 DSM Forecast		- 283	- 487	- 780	-1 056	-1 407	-1 730	-1 988	-2 183	-2 296	-2 405	-2 487	-2 562	-2 637	-2 717	-2 797	-2 825	-2 851	-2 874
8 **Manitoba Net Load**		**25 356**	**25 753**	**25 766**	**26 228**	**26 365**	**26 627**	**26 678**	**26 754**	**26 988**	**27 221**	**27 483**	**27 754**	**28 022**	**28 289**	**28 555**	**28 878**	**29 210**	**29 550**
Contracted Exports		3 421	2 631	3 247	3 367	3 166	3 125	3 951	4 604	4 503	4 476	4 476	2 193	2 049	1 634	1 551	1 551	1 389	1 389
Proposed Exports																			
Less: Adverse Water			- 309	- 370	- 370	- 370	- 370	- 370	- 489	- 512	- 512	- 512	- 85						
9 **Total Net Exports**		**3 421**	**2 322**	**2 877**	**2 997**	**2 796**	**2 755**	**3 581**	**4 115**	**3 991**	**3 964**	**3 964**	**2 108**	**2 049**	**1 634**	**1 551**	**1 551**	**1 389**	**1 389**
10 **Total Energy Demand**	8+9	**28 777**	**28 075**	**28 643**	**29 225**	**29 161**	**29 382**	**30 259**	**30 869**	**30 979**	**31 185**	**31 447**	**29 862**	**30 071**	**29 923**	**30 106**	**30 429**	**30 599**	**30 939**
11 **System Surplus**	7-10	**1 481**	**2 590**	**2 146**	**1 551**	**1 718**	**1 753**	**4 187**	**3 843**	**3 701**	**3 495**	**3 223**	**4 359**	**4 034**	**3 784**	**3 534**	**3 244**	**2 698**	**2 322**

System Firm Energy Demand and Dependable Resources (GWh) @ generation
2014/15 PRP
No New Resources

Fiscal Year		2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa																			
Keeyask		3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003
1 **Total New Hydro**		**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New Nug PPA																			
Contracted																			
Proposed		97	97	97	97														
3 **Total New Nug PPA**		**97**	**97**	**97**	**97**														
4 New Wind																			
5 **Total New Power Resources**	1+2+3+4	**3 100**	**3 100**	**3 100**	**3 100**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**
Base Supply Power Resources																			
Existing Hydro		21 683	21 673	21 673	21 663	21 653	21 653	21 643	21 643	21 633	21 623	21 623	21 613	21 603	21 603	21 593	21 583	21 583	21 573
Existing Thermal																			
Brandon Coal - Unit 5																			
Selkirk Gas		953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
Brandon Units 6-7 SCGT		2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354
Contracted Imports		1 113	1 113	1 113	186														
Proposed Imports																			
Hydro Adjustment																			
Market Purchases		3 135	3 172	3 208	3 135	3 150	3 187	3 224	3 257	3 295	3 333	3 370	3 408	3 446	3 484	3 522	3 560	3 598	3 636
Existing Wind		771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771
Pointe du Bois Rebuild									147	237	237	237	237	237	237	237	237	237	237
Bipole III Reduced Losses		177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177
6 **Total Base Supply Power Resources**		**30 186**	**30 213**	**30 249**	**29 239**	**29 058**	**29 095**	**29 122**	**29 302**	**29 420**	**29 448**	**29 485**	**29 513**	**29 541**	**29 579**	**29 607**	**29 635**	**29 673**	**29 701**
7 **Total Power Resources**	5+6	**33 286**	**33 313**	**33 349**	**32 339**	**32 061**	**32 098**	**32 125**	**32 305**	**32 423**	**32 451**	**32 488**	**32 516**	**32 544**	**32 582**	**32 610**	**32 638**	**32 676**	**32 704**
Manitoba Domestic Load																			
2014 Base Load Forecast		32 796	33 177	33 557	33 937	34 317	34 698	35 078	35 458	35 839	36 219	36 599	36 980	37 360	37 740	38 121	38 501	38 881	39 262
Construction Power - Hydro					4	12	16	28	8	8	4								
Less: 2014 DSM Forecast		-2 895	-2 912	-2 931	-2 951	-2 972	-2 993	-3 015	-3 037	-3 041	-3 042	-3 044	-3 046	-3 046	-3 046	-3 046	-3 046	-3 046	-3 046
8 **Manitoba Net Load**		**29 901**	**30 265**	**30 626**	**30 990**	**31 357**	**31 721**	**32 091**	**32 429**	**32 806**	**33 181**	**33 555**	**33 934**	**34 314**	**34 694**	**35 075**	**35 455**	**35 835**	**36 216**
Contracted Exports		1 389	1 389	1 389	353	145	145	145	145	145	145	145	145	145	145	145	145	145	145
Proposed Exports																			
Less: Adverse Water																			
9 **Total Net Exports**		**1 389**	**1 389**	**1 389**	**353**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**
10 **Total Energy Demand**	8+9	**31 290**	**31 654**	**32 015**	**31 343**	**31 502**	**31 866**	**32 236**	**32 574**	**32 951**	**33 326**	**33 700**	**34 079**	**34 459**	**34 839**	**35 220**	**35 600**	**35 980**	**36 361**
11 **System Surplus**	7-10	**1 995**	**1 658**	**1 333**	**996**	**559**	**232**	**- 111**	**- 269**	**- 528**	**- 875**	**-1 212**	**-1 563**	**-1 915**	**-2 257**	**-2 610**	**-2 962**	**-3 304**	**-3 657**

6.0 ELECTRICITY SUPPLY

Manitoba Hydro's 2014/15 Power Resource Plan indicates new generation is required by 2038/39 to meet the current projection of Manitoba load requirements under dependable energy conditions. New capacity resources are forecast to be required by 2037/38.

The following resources contribute to the ability to meet future Manitoba energy and capacity requirements.

	MW	Dependable GW.h	In-Service Date
HVDC Bipole III Line & 2300 MW of Converter Capability	80	177	2018/19
Keeyask	695	3 000	2019/20
Demand Side Management Program			
Planned Additional	582	2 797	By 2028/29

For IFF14 forecast purposes, it is assumed that Conawapa has been suspended and replaced with a gas turbine required in 2037/38 to meet firm capacity requirements. While the majority of planning and licensing activities on Conawapa have been suspended, Manitoba Hydro continues to pursue dependable firm export sales based on the earliest possible in-service date of Conawapa in 2029/30 and will re-evaluate the business case (currently anticipated by the Fall of 2016).

21

System Firm Winter Peak Demand and Capacity Resources (MW) @ generation
2014/15 PRP
Recommended Plan (Keeyask 2019, Conawapa 2029)

Fiscal Year		2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa																	520	1 040	1 300
Keeyask							90	630	630	630	630	630	630	630	630	630	630	630	630
1 **Total New Hydro**							90	630	630	630	630	630	630	630	630	630	1 150	1 670	1 930
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New NUG PPA																			
Contracted																			
Proposed				12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
3 **Total New NUG PPA**				12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4 **Total New Power Resources**	1+2+3			12	12	12	102	642	642	642	642	642	642	642	642	642	1 162	1 682	1 942
Base Supply Power Resources																			
Existing Hydro		5 133	5 172	5 164	5 190	5 195	5 196	5 181	5 172	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 143
Existing Thermal																			
Brandon Coal - Unit 5		105	105	105	105	105													
Selkirk Gas			66	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Brandon Units 6-7 SCGT		280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
Contracted Imports		605	605	605	605	605	605	605	605	605	605	605	220	220	220	220	220		
Proposed Imports																			
Pointe du Bois Rebuild																			
Bipole III Reduced Losses						90	90	80	80	80	80	80	80	80	80	80	80	21	21
5 **Total Base Supply Power Resources**		6 123	6 228	6 286	6 312	6 407	6 303	6 278	6 269	6 264	6 264	6 264	5 879	5 879	5 879	5 879	5 879	5 600	5 576
6 **Total Power Resources**	4+5	6 123	6 228	6 298	6 324	6 419	6 405	6 920	6 911	6 906	6 906	6 906	6 521	6 521	6 521	6 521	7 041	7 282	7 518
Peak Demand																			
2014 Base Load Forecast		4 716	4 803	4 861	4 985	5 068	5 166	5 223	5 284	5 342	5 400	5 458	5 516	5 574	5 632	5 690	5 748	5 808	5 869
Less: 2014 DSM Forecast		- 60	- 111	- 169	- 226	- 293	- 353	- 406	- 449	- 475	- 498	- 517	- 533	- 550	- 566	- 582	- 585	- 589	- 592
7 **Manitoba Net Load**		4 656	4 692	4 692	4 759	4 775	4 813	4 817	4 835	4 867	4 902	4 941	4 983	5 024	5 066	5 108	5 163	5 219	5 277
Contracted Exports		726	484	724	724	559	559	779	908	880	880	880	385	385	275	275	614	614	614
Proposed Exports																			
8 **Total Exports**		726	484	724	724	559	559	779	908	880	880	880	385	385	275	275	614	614	614
9 **Total Peak Demand**	7+8	5 382	5 176	5 416	5 483	5 334	5 372	5 596	5 743	5 747	5 782	5 821	5 368	5 409	5 341	5 383	5 777	5 833	5 891
10 Reserves		513	563	563	571	573	577	578	580	584	588	593	598	603	608	613	620	626	633
11 **System Surplus**	6-9-10	228	489	319	270	512	456	746	588	575	536	492	555	509	572	525	644	823	994

Conawapa In-Service

System Firm Winter Peak Demand and Capacity Resources (MW) @ generation
2014/15 PRP
Recommended Plan (Keeyask 2019, Conawapa 2029)

Fiscal Year		2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa		1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300	1 300
Keeyask		630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630
1 **Total New Hydro**		1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New NUG PPA																			
Contracted																			
Proposed		12	12	12	12														
3 **Total New NUG PPA**		12	12	12	12														
4 **Total New Power Resources**	1+2+3	1 942	1 942	1 942	1 942	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930	1 930
Base Supply Power Resources																			
Existing Hydro		5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143	5 143
Existing Thermal																			
Brandon Coal - Unit 5																			
Selkirk Gas		132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Brandon Units 6-7 SCGT		280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
Contracted Imports																			
Proposed Imports																			
Pointe du Bois Rebuild									87	87	87	87	87	87	87	87	87	87	87
Bipole III Reduced Losses		21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
5 **Total Base Supply Power Resources**		5 576	5 576	5 576	5 576	5 576	5 576	5 576	5 663	5 663	5 663	5 663	5 663	5 663	5 663	5 663	5 663	5 663	5 663
6 **Total Power Resources**	4+5	7 518	7 518	7 518	7 518	7 506	7 506	7 506	7 593	7 593	7 593	7 593	7 593	7 593	7 593	7 593	7 593	7 593	7 593
Peak Demand																			
2014 Base Load Forecast		5 931	5 995	6 058	6 122	6 185	6 249	6 313	6 376	6 440	6 504	6 567	6 631	6 694	6 758	6 822	6 885	6 949	7 012
Less: 2014 DSM Forecast		- 594	- 596	- 598	- 601	- 604	- 607	- 610	- 613	- 614	- 614	- 615	- 615	- 615	- 615	- 615	- 615	- 615	- 615
7 **Manitoba Net Load**		5 337	5 399	5 460	5 521	5 581	5 642	5 703	5 763	5 826	5 890	5 952	6 016	6 079	6 143	6 207	6 270	6 334	6 397
Contracted Exports		614	614	614	339														
Proposed Exports																			
8 **Total Exports**		614	614	614	339														
9 **Total Peak Demand**	7+8	5 951	6 013	6 074	5 860	5 581	5 642	5 703	5 763	5 826	5 890	5 952	6 016	6 079	6 143	6 207	6 270	6 334	6 397
10 Reserves		640	648	655	663	670	677	684	692	699	707	714	722	729	737	745	752	760	768
11 **System Surplus**	6-9-10	927	857	789	995	1 255	1 187	1 119	1 138	1 068	996	927	855	785	713	641	571	499	428

System Firm Energy Demand and Dependable Resources (GWh) @ generation
2014/15 PRP
Recommended Plan (Keeyask 2019, Conawapa 2029)

Fiscal Year		2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa																	2 198	4 650	4 650
Keeyask							493	2 974	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003
1 **Total New Hydro**							**493**	**2 974**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**5 201**	**7 653**	**7 653**
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New Nug PPA																			
Contracted																			
Proposed				97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97
3 **Total New Nug PPA**				**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**
4 New Wind																			
5 **Total New Power Resources**	1+2+3+4			**97**	**97**	**97**	**590**	**3 071**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**5 298**	**7 750**	**7 750**
Base Supply Power Resources																			
Existing Hydro		21 928	21 924	21 892	21 878	21 880	21 863	21 816	21 775	21 743	21 743	21 733	21 723	21 723	21 713	21 703	21 703	21 693	21 693
Existing Thermal																			
Brandon Coal - Unit 5		811	811	811	811	811	592												
Selkirk Gas		953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
Brandon Units 6-7 SCGT		2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354
Contracted Imports		2 730	2 485	2 575	2 575	2 575	2 575	4 244	4 579	4 579	4 579	4 579	3 212	2 941	2 941	2 941	2 941	2 159	2 004
Proposed Imports																			
Hydro Adjustment		373	784	844	844	844	844	844	844	844	844	844	406	307	307	307	307	70	
Market Purchases		337	583	493	493	493	493	216	159	159	159	159	1 527	1 786	1 400	1 346	1 756	2 579	2 734
Existing Wind		771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771
Pointe du Bois Rebuild																			
Bipole III Reduced Losses						101	101	177	177	177	177	177	177	177	177	177	177	261	261
6 **Total Base Supply Power Resources**		**30 257**	**30 665**	**30 693**	**30 679**	**30 782**	**30 546**	**31 375**	**31 612**	**31 580**	**31 580**	**31 570**	**31 123**	**31 012**	**30 616**	**30 552**	**30 962**	**30 840**	**30 770**
7 **Total Power Resources**	5+6	**30 257**	**30 665**	**30 789**	**30 775**	**30 878**	**31 135**	**34 446**	**34 712**	**34 680**	**34 680**	**34 670**	**34 222**	**34 111**	**33 715**	**33 651**	**36 259**	**38 590**	**38 520**
Manitoba Domestic Load																			
2014 Base Load Forecast		25 639	26 130	26 436	27 174	27 662	28 247	28 583	28 937	29 284	29 626	29 970	30 316	30 659	31 006	31 352	31 703	32 061	32 424
Construction Power - Hydro			110	110	110	110	110	83	10	15	20	30	50	55	80	100	90	30	5
Less: 2014 DSM Forecast		- 283	- 487	- 780	-1 056	-1 407	-1 730	-1 988	-2 183	-2 296	-2 405	-2 487	-2 562	-2 637	-2 717	-2 797	-2 825	-2 851	-2 874
8 **Manitoba Net Load**		**25 356**	**25 753**	**25 766**	**26 228**	**26 365**	**26 627**	**26 678**	**26 764**	**27 003**	**27 241**	**27 513**	**27 804**	**28 077**	**28 369**	**28 655**	**28 968**	**29 240**	**29 555**
Contracted Exports		3 421	2 631	3 247	3 367	3 166	3 125	3 951	4 604	4 503	4 476	4 476	2 193	2 049	1 634	1 551	1 930	2 922	2 922
Proposed Exports																			
Less: Adverse Water			- 309	- 370	- 370	- 370	- 370	- 370	- 489	- 512	- 512	- 512	- 85						
9 **Total Net Exports**		**3 421**	**2 322**	**2 877**	**2 997**	**2 796**	**2 755**	**3 581**	**4 115**	**3 991**	**3 964**	**3 964**	**2 108**	**2 049**	**1 634**	**1 551**	**1 930**	**2 922**	**2 922**
10 **Total Energy Demand**	8+9	**28 777**	**28 075**	**28 643**	**29 225**	**29 161**	**29 382**	**30 259**	**30 879**	**30 994**	**31 205**	**31 477**	**29 912**	**30 126**	**30 003**	**30 206**	**30 898**	**32 162**	**32 477**
11 **System Surplus**	7-10	**1 481**	**2 590**	**2 146**	**1 551**	**1 718**	**1 753**	**4 187**	**3 833**	**3 685**	**3 474**	**3 192**	**4 310**	**3 985**	**3 712**	**3 445**	**5 361**	**6 428**	**6 043**

System Firm Energy Demand and Dependable Resources (GWh) @ generation
2014/15 PRP
Recommended Plan (Keeyask 2019, Conawapa 2029)

Fiscal Year		2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa		4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650	4 650
Keeyask		3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003
1 **Total New Hydro**		**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New Nug PPA																			
Contracted																			
Proposed		97	97	97	97														
3 **Total New Nug PPA**		**97**	**97**	**97**	**97**														
4 New Wind																			
5 **Total New Power Resources**	1+2+3+4	**7 750**	**7 750**	**7 750**	**7 750**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**	**7 653**
Base Supply Power Resources																			
Existing Hydro		21 683	21 673	21 673	21 663	21 653	21 653	21 643	21 643	21 633	21 623	21 623	21 613	21 603	21 603	21 593	21 583	21 583	21 573
Existing Thermal																			
Brandon Coal - Unit 5																			
Selkirk Gas		953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
Brandon Units 6-7 SCGT		2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354
Contracted Imports		2 004	2 004	2 004	1 077	149													
Proposed Imports																			
Hydro Adjustment																			
Market Purchases		2 734	2 734	2 734	3 661	3 257	3 187	3 224	3 257	3 295	3 333	3 370	3 408	3 446	3 484	3 522	3 560	3 598	3 636
Existing Wind		771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771
Pointe du Bois Rebuild									147	237	237	237	237	237	237	237	237	237	237
Bipole III Reduced Losses		261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261	261
6 **Total Base Supply Power Resources**		**30 760**	**30 750**	**30 750**	**30 740**	**29 398**	**29 179**	**29 206**	**29 386**	**29 504**	**29 532**	**29 569**	**29 597**	**29 625**	**29 663**	**29 691**	**29 719**	**29 757**	**29 785**
7 **Total Power Resources**	5+6	**38 510**	**38 500**	**38 500**	**38 490**	**37 051**	**36 832**	**36 859**	**37 039**	**37 157**	**37 185**	**37 222**	**37 250**	**37 278**	**37 316**	**37 344**	**37 372**	**37 410**	**37 438**
Manitoba Domestic Load																			
2014 Base Load Forecast		32 796	33 177	33 557	33 937	34 317	34 698	35 078	35 458	35 839	36 219	36 599	36 980	37 360	37 740	38 121	38 501	38 881	39 262
Construction Power - Hydro					4	12	16	28	8	8	4								
Less: 2014 DSM Forecast		-2 895	-2 912	-2 931	-2 951	-2 972	-2 993	-3 015	-3 037	-3 041	-3 042	-3 044	-3 046	-3 046	-3 046	-3 046	-3 046	-3 046	-3 046
8 **Manitoba Net Load**		**29 901**	**30 265**	**30 626**	**30 990**	**31 357**	**31 721**	**32 091**	**32 429**	**32 806**	**33 181**	**33 555**	**33 934**	**34 314**	**34 694**	**35 075**	**35 455**	**35 835**	**36 216**
Contracted Exports		2 922	2 922	2 922	1 886	401	145	145	145	145	145	145	145	145	145	145	145	145	145
Proposed Exports																			
Less: Adverse Water																			
9 **Total Net Exports**		**2 922**	**2 922**	**2 922**	**1 886**	**401**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**	**145**
10 **Total Energy Demand**	8+9	**32 823**	**33 187**	**33 548**	**32 876**	**31 758**	**31 866**	**32 236**	**32 574**	**32 951**	**33 326**	**33 700**	**34 079**	**34 459**	**34 839**	**35 220**	**35 600**	**35 980**	**36 361**
11 **System Surplus**	7-10	**5 686**	**5 312**	**4 951**	**5 614**	**5 293**	**4 966**	**4 623**	**4 465**	**4 206**	**3 859**	**3 522**	**3 171**	**2 819**	**2 477**	**2 124**	**1 772**	**1 430**	**1 077**

Non-Utility Generation
Manitoba Hydro and Kineticor Resource Corp. executed a Term Sheet for the purchase of 11.65 MW of flare gas generated electricity over a 20 year term. This agreement is assumed to add 97 GW.h of dependable energy to Manitoba Hydro's system.

4.5 Imports from Neighbouring Utilities
Manitoba Hydro has long-term seasonal diversity contracts with Northern States Power (NSP) and Great River Energy (GRE) which provide for winter capacity and dependable energy imports during the winter season in exchange for exports of capacity and energy during the summer season.

The diversity agreements combined provide for an exchange of capacity of 550 MW in 2014/15 and remaining at that quantity until 2024/25, then reducing to 200 MW until it expires in 2029/30. In addition to the diversity agreements, Manitoba Hydro has a 500 MW import agreement with NSP which provides access to energy throughout the year but as the contract does not have a capacity component it is not guaranteed for any particular hour.

Manitoba Hydro's firm northbound scheduling limit from the US Midwest Independent System Operator (MISO) market is 700 MW. In 2020, this limit increases to 1398 MW with the addition of the new 500kV interconnection.

4.6 Loss Reduction due to Bipole III
Bipole III continues to be needed to satisfy reliability requirements within Manitoba, and also results in notable reductions in transmission losses prior to new northern generation. Bipole III, routed on the west side of lakes Manitoba and Winnipegosis, is planned for a 2018/19 in-service date.

Bipole III does not provide any new generation, but is expected to reduce the transmission losses which currently exist on the HVDC system. By using all three bipoles to transmit the lower Nelson River generation, rather than just the existing two, the losses are reduced, resulting in 80 MW and 177 GW.h/year of reduced losses under drought conditions. This benefit has been included and is adjusted downward as new northern hydroelectric generation increases the loading.

4.7 Conawapa Generating Station
Conawapa G.S. is planned to be a ten unit plant located downstream of the Limestone G.S. on the Nelson River. The current design rating for Conawapa G.S. is 1485 MW during open water conditions. Initial impoundment of the forebay will reduce Limestone G.S. output by 90 MW, resulting in a net increase in system summer capacity of 1395 MW. Downstream ice conditions will reduce Conawapa G.S. output by approximately 55 MW and similarly ice conditions will further reduce Limestone G.S. by about 40 MW during winter peak conditions resulting in a nominal net system addition of 1300 MW.

The earliest ISD for Conawapa G.S. is 2029/30. In order to achieve the 2029/30 planned ISD, the construction start date is scheduled for January 2021.

Manitoba Hydro is in the process of winding down activities and expenditures for the Conawapa project to a minimal level. While the NFAT process did not result in approval for the Conawapa Project, it is included in the 2014/15 recommended development plan to recognize current negotiations for new export sales and to enable additional analysis of the need and timing of Conawapa G.S. It is expected that Manitoba Hydro will only reinitiate Conawapa project activities if future studies and review provide a strong business case.

The 2014/15 Power Resource Plan does not trigger any additional work to protect an in-service date for Conawapa G.S.

22

4 SUPPLY OF POWER

This section describes resources that form the base supply of power available to meet Manitoba load requirements and identifies when new base supply resources are required.

Base supply of power is comprised of the following system resources that are common to all development plans being evaluated:

- generating resources owned/operated by Manitoba Hydro including any planned upgrades and committed new resources,
- power purchases from non utility generators in Manitoba,
- imports from neighbouring U.S. utilities,
- projects to replace existing generating resources where plans are in place, and
- reduced losses due to increased HVDC system capacity.

4.1 Manitoba Hydro Operated Facilities – Hydroelectric and Thermal Generation

The following provides a summary of notable assumptions and/or current status updates for specific resources.

Kelsey Rerunnering

The major upgrade of Kelsey G.S. consists of the replacement of all seven turbine runners and generator windings resulting in increased plant capacity of 77 MW and greater utilization of Nelson River inflows. The upgrade was completed in the 2013/14 fiscal year.

The rerunnering project did not significantly increase dependable energy at Kelsey, however there was an increase in average energy of about 350 GW.h/year. Both the capacity gains and energy gains will be confirmed with performance tests. Initial capacity gains shown are estimated prior to performance testing; after performance tests are complete these ratings will be confirmed more accurately.

Brandon Generating Station Unit 5 – Coal-Fired Generation
Availability Assumptions

Brandon Unit 5, Manitoba Hydro's sole remaining coal-fired generating unit, is assumed to remain available until December 31, 2019.

The Climate Change and Emissions Reductions Act

Brandon Unit 5 is governed by the provincial *Climate Change and Emissions Reductions Act* and its subsequent *MR 186/2009*, the *Coal-Fired Emergency Operations Regulation* which restricted coal-fired operation to *"...support emergency operations*".

Operation of Brandon Unit 5 will occur for two main purposes as defined in *MR 186/2009,* the *Coal-Fired Emergency Operations Regulation*: mitigation of adverse water conditions commonly referred to as "drought", and to provide system reliability support.

23

4 SUPPLY OF POWER

This section describes resources that form the base supply of power available to meet Manitoba load requirements and identifies when new base supply resources are required.

Base supply of power is comprised of the following system resources that are common to all development plans being evaluated:

- generating resources owned/operated by Manitoba Hydro including any planned upgrades and committed new resources,
- power purchases from non utility generators in Manitoba,
- imports from neighbouring U.S. utilities,
- projects to replace existing generating resources where plans are in place, and
- reduced losses due to increased HVDC system capacity.

4.1 Manitoba Hydro Operated Facilities – Hydroelectric and Thermal Generation

The following provides a summary of notable assumptions and/or current status updates for specific resources.

Kelsey Rerunnering

The major upgrade of Kelsey G.S. consists of the replacement of all seven turbine runners and generator windings resulting in increased plant capacity of 77 MW and greater utilization of Nelson River inflows. The upgrade was completed in the 2013/14 fiscal year.

The rerunnering project did not significantly increase dependable energy at Kelsey, however there was an increase in average energy of about 350 GW.h/year. Both the capacity gains and energy gains will be confirmed with performance tests. Initial capacity gains shown are estimated prior to performance testing; after performance tests are complete these ratings will be confirmed more accurately.

Brandon Generating Station Unit 5 – Coal-Fired Generation

Availability Assumptions

Brandon Unit 5, Manitoba Hydro's sole remaining coal-fired generating unit, is assumed to remain available until December 31, 2019.

The Climate Change and Emissions Reductions Act

Brandon Unit 5 is governed by the provincial *Climate Change and Emissions Reductions Act* and its subsequent *MR 186/2009*, the *Coal-Fired Emergency Operations Regulation* which restricted coal-fired operation to *"...support emergency operations*".

Operation of Brandon Unit 5 will occur for two main purposes as defined in *MR 186/2009,* the *Coal-Fired Emergency Operations Regulation*: mitigation of adverse water conditions commonly referred to as "drought", and to provide system reliability support.

In order to maintain the effective power generation capability of Unit 5 for either of these purposes, preparation for emergency support will be necessary. It is estimated that operation for this purpose will generate approximately 100 GW.h/year. An additional 25 GW.h/year may be required for emergency service resulting in estimated Unit 5 generation to be in the order of 125 GW.h/year.

Under the conditions previously described, Brandon Unit 5 can continue to operate up to its maximum capability of 811 GW.h/year (northern equivalent). Unit 5 generation is assumed to be available to meet all commitments existing prior to the introduction of the Act. In the future however, Brandon Unit 5 energy shall not be considered available to supply new sales including future long-term dependable export sales.

Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations
Environment Canada's *Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations* establishes the allowable duration of long-term operation of Brandon Generating Station Unit 5. The federal regulation does not affect operation of Brandon Unit 5 until January 1, 2020. Until that time Brandon will continue to operate as restricted under provincial regulation. Commencing January 1, 2020, the unit can be utilized as a "standby" unit until December 31, 2029. A "standby" unit is permitted to operate to a maximum annual net capacity factor of 9 percent for non-emergency purposes. However starting January 1, 2020, after-the-fact approval of emergency operations is required from the federal Minister of the Environment. Medium term emergencies are limited to a 90 day period but can be extended for another 90 day term. Prolonged, unrestricted operation during a long term, "shortage of fuel" emergency (i.e. drought) after January 1, 2020 is permitted, but requires a declaration by the provincial Minister responsible for the Emergency Measures Act.

Environment Act License Review
As part of an on-going public license review by Manitoba Conservation, Manitoba Hydro submitted an Environmental Impact Statement (EIS) in December 2006.

An update to the 2006 EIS was submitted to Manitoba Conservation in early 2011, which concluded that the original 2006 EIS submission remains valid and applicable to the Environment Act License Review (EALR) process.

Brandon Generating Station Units 6 and 7 – Natural Gas-Fired Generation
The annual firm energy assumption for Brandon Units 6 and 7 is 2354 GW.h . The firm capacity (Winter Peak) remains at 280 MW reflecting the results of Generation Verification Test Capacity (GVTC) testing. Brandon Units 6 and 7 are assumed to remain in service throughout the planning horizon assuming only routine capital investment.

Selkirk Generating Station Units 1 and 2 – Natural Gas-Fired Generation
Selkirk is assumed to remain in operation to the end of the planning horizon assuming only routine capital investment.

Pointe du Bois Generating Station

For the 2014/15 Power Resource Plan the Pointe du Bois powerhouse rebuild is assumed for 2039/40. This is a 10 year deferral from the 2013/14 Power Resource Plan. A review of the life extension of the Pointe de Bois powerhouse has been initiated.

4.2 Committed Resources

Consistent with Provincial approvals stemming from the Needs For and Alternatives To (NFAT) process and environmental regulatory approvals, Keeyask G.S. and a new 500kV US interconnection are included as committed resources.

Keeyask Generating Station

The Keeyask G.S. will be located upstream of the Kettle G.S. on the lower Nelson River with 7 units having a maximum rated total power capacity of 695 MW, which occurs when Stephens Lake is drawn down. There will be a net addition of 630 MW to Manitoba Hydro's Integrated Power System once the Keeyask G.S. is added.

Construction of the Keeyask Generation Project began in July 2014, following receipt of all required provincial and federal licenses, authorizations and permits. The first unit is planned to be in-service in 2019 and with the last unit in-service by the fall of 2022.

4.3 Resources in Regulatory Approval Process

US Interconnection

The new 500 kV US interconnection is capable of 698 MW for import and 883 MW for export. The new interconnection is assumed to have an in-service date of June 1, 2020 which is coincident with the start of the MH–MP250 MW Sale Agreements. The new interconnection received approval through the 2013/14 Need For and Alternatives To (NFAT) process but requires several other Canadian and US regulatory approvals which are expected to be received by late 2016.

4.4 Power Purchases from Manitoba Generators

Wind Generation

Manitoba Hydro has power purchase agreements (PPAs) with three wind producers, St. Leon Energy LP, Algonquin Power, and Pattern Energy Group. These PPA's provide Manitoba Hydro with 771 GW.h of dependable energy on an annual basis. Wind generation is not assigned a capacity value for the purposes of meeting winter peak load as it is not assured to be available at the time of system peak. For planning purposes, contracted purchases of wind generation are assumed to be renewed using the same terms and conditions after the expiration of the current contracts and to extend through to the end of the study period.

Non-Utility Generation
Manitoba Hydro and Kineticor Resource Corp. executed a Term Sheet for the purchase of 11.65 MW of flare gas generated electricity over a 20 year term. This agreement is assumed to add 97 GW.h of dependable energy to Manitoba Hydro's system.

4.5 Imports from Neighbouring Utilities
Manitoba Hydro has long-term seasonal diversity contracts with Northern States Power (NSP) and Great River Energy (GRE) which provide for winter capacity and dependable energy imports during the winter season in exchange for exports of capacity and energy during the summer season.

The diversity agreements combined provide for an exchange of capacity of 550 MW in 2014/15 and remaining at that quantity until 2024/25, then reducing to 200 MW until it expires in 2029/30. In addition to the diversity agreements, Manitoba Hydro has a 500 MW import agreement with NSP which provides access to energy throughout the year but as the contract does not have a capacity component it is not guaranteed for any particular hour.

Manitoba Hydro's firm northbound scheduling limit from the US Midwest Independent System Operator (MISO) market is 700 MW. In 2020, this limit increases to 1398 MW with the addition of the new 500kV interconnection.

4.6 Loss Reduction due to Bipole III
Bipole III continues to be needed to satisfy reliability requirements within Manitoba, and also results in notable reductions in transmission losses prior to new northern generation. Bipole III, routed on the west side of lakes Manitoba and Winnipegosis, is planned for a 2018/19 in-service date.

Bipole III does not provide any new generation, but is expected to reduce the transmission losses which currently exist on the HVDC system. By using all three bipoles to transmit the lower Nelson River generation, rather than just the existing two, the losses are reduced, resulting in 80 MW and 177 GW.h/year of reduced losses under drought conditions. This benefit has been included and is adjusted downward as new northern hydroelectric generation increases the loading.

4.7 Conawapa Generating Station
Conawapa G.S. is planned to be a ten unit plant located downstream of the Limestone G.S. on the Nelson River. The current design rating for Conawapa G.S. is 1485 MW during open water conditions. Initial impoundment of the forebay will reduce Limestone G.S. output by 90 MW, resulting in a net increase in system summer capacity of 1395 MW. Downstream ice conditions will reduce Conawapa G.S. output by approximately 55 MW and similarly ice conditions will further reduce Limestone G.S. by about 40 MW during winter peak conditions resulting in a nominal net system addition of 1300 MW.

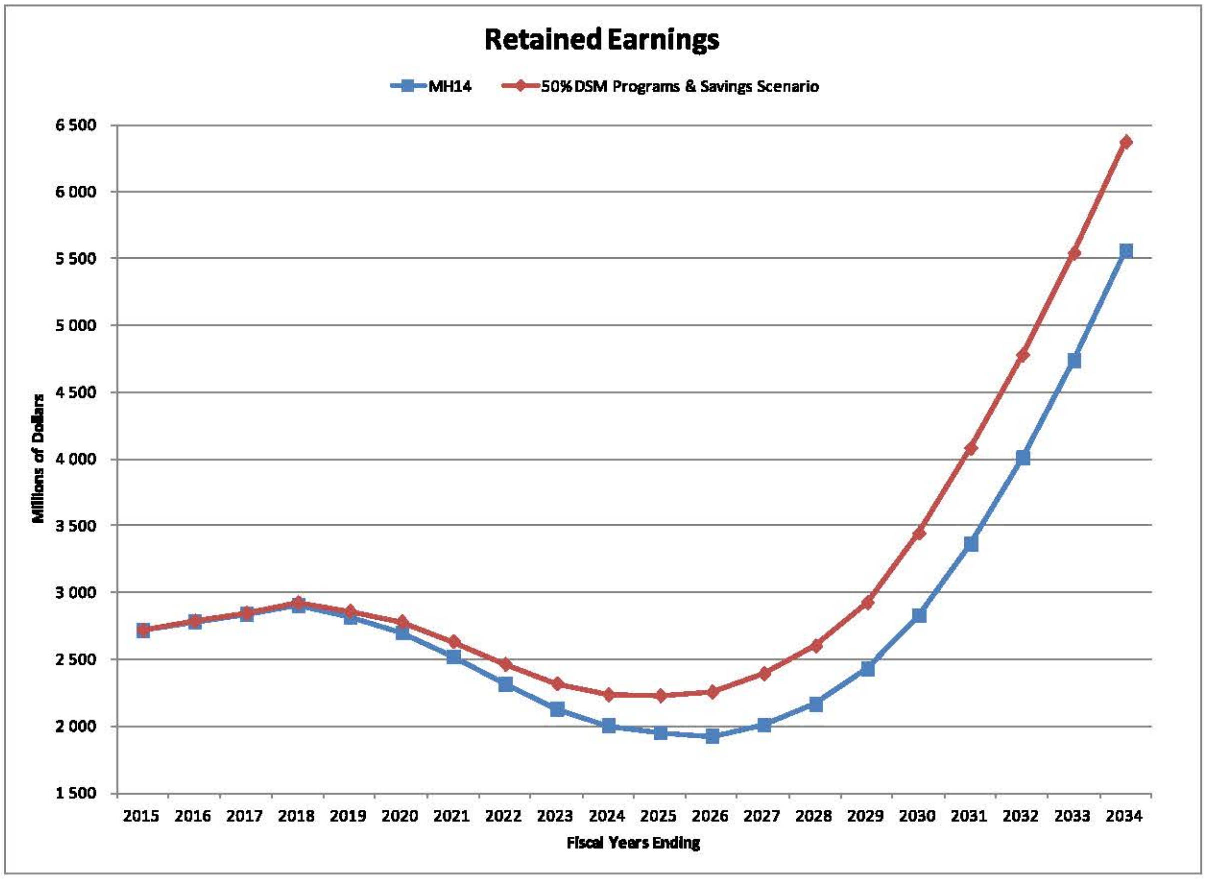
The earliest ISD for Conawapa G.S. is 2029/30. In order to achieve the 2029/30 planned ISD, the construction start date is scheduled for January 2021.

Manitoba Hydro is in the process of winding down activities and expenditures for the Conawapa project to a minimal level. While the NFAT process did not result in approval for the Conawapa Project, it is included in the 2014/15 recommended development plan to recognize current negotiations for new export sales and to enable additional analysis of the need and timing of Conawapa G.S. It is expected that Manitoba Hydro will only reinitiate Conawapa project activities if future studies and review provide a strong business case.

The 2014/15 Power Resource Plan does not trigger any additional work to protect an in-service date for Conawapa G.S.

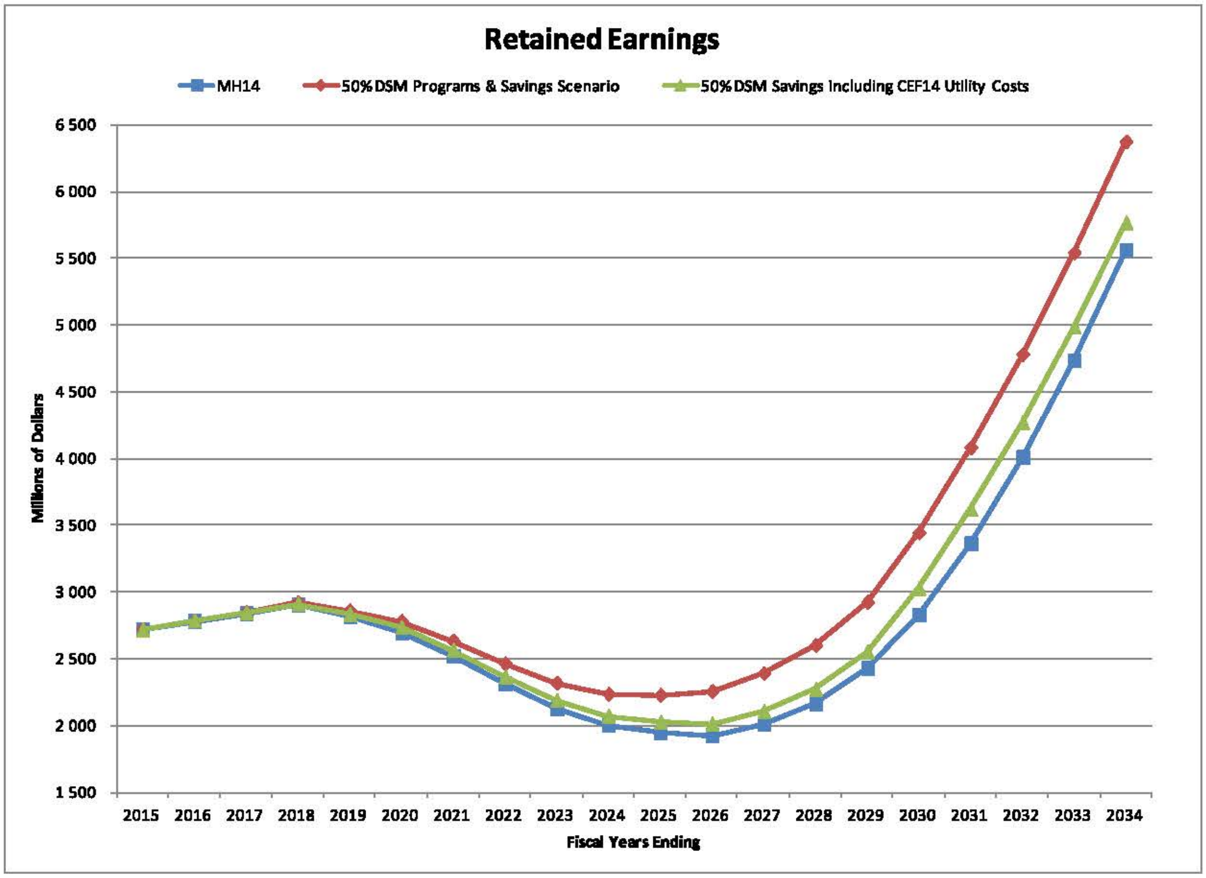
- The reduction in DSM savings results in less energy available for export and reduces projected net export revenue (net of water rentals and fuel and power purchased) by $1.5 billion over the period to 2033/34 compared to MH14.

The following figure shows the retained earnings under MH14 and the 50% DSM programs and savings scenario over the forecast period to 2033/34. The 50% DSM programs and savings scenario results in cumulative projected losses of $694 million over the six year period 2018/19 to 2023/24 compared to $978 million in cumulative losses over the eight year period 2018/19 to 2025/26 in MH14.



An alternative scenario has been prepared with the same assumptions as noted above except that the DSM utility costs are the same as CEF14. This scenario shows the financial impacts of Manitoba Hydro's investment in more aggressive DSM but do not result in the projected savings or customer uptake.

The following figure shows the projected retained earnings of the alternate DSM savings scenario assuming the same utility costs as CEF14 compared to MH14 and the DSM 50% programs and savings scenario.



Projected retained earnings are approximately $200 million higher compared to MH14 due to the shift in energy from export sales to domestic sales and partially offset by the incremental operating and carrying costs for the additional generation required to meet domestic load in 2030/31 and 2032/33. This scenario results in projected cumulative net losses of $898 billion over the eight year period 2018/19 to 2025/26.

Mathematically, the even annual rate increase under the DSM savings scenarios may be reduced from MH14's projected 3.95% rate increases from 2015/16 to 2030/31 to 3.83% and 3.92%, respectively (assumes the 2.0% rate increases 2031/32 to 2033/34 remain the same under both scenarios). However, a reduction to even annual rate increases only serves to increase the cumulative losses projected under both these DSM savings scenarios increasing the risk of rate instability for customers. The proposed and projected 3.95% rate increases are the minimum required to maintain Manitoba Hydro's financial strength and affordable, predictable rates for customers.

The projected financial statements for the DSM 50% program and savings scenario and the alternate DSM 50% savings scenario including the CEF14 utility costs are attached.

Electric Operations 50% DSM Programs & Savings

Projected Operating Statement

(In Millions of Dollars)

For the year ended March 31	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
REVENUES										
General Consumers Revenue at approved rates	1 617	1 633	1 649	1 665	1 681	1 698	1 716	1 734	1 753	1 772
Additional General Consumers Revenue	765	868	976	1 090	1 210	1 338	1 473	1 553	1 637	1 723
BPIII Reserve Account	-	-	-	-	-	-	-	-	-	-
Extraprovincial	913	840	849	824	817	863	848	816	813	810
Other	16	17	17	18	18	18	19	19	19	20
	3 312	3 358	3 491	3 596	3 726	3 918	4 056	4 123	4 222	4 325
EXPENSES										
Operating and Administrative	644	657	669	683	696	705	725	739	761	776
Finance Expense	1 331	1 324	1 311	1 309	1 290	1 262	1 217	1 161	1 122	1 092
Depreciation and Amortization	746	757	770	784	793	804	816	838	852	878
Water Rentals and Assessments	133	132	133	133	134	138	138	137	137	137
Fuel and Power Purchased	288	286	295	297	306	301	332	353	386	406
Capital and Other Taxes	161	162	163	164	166	168	170	172	175	176
Corporate Allocation	8	8	8	8	8	6	5	6	5	5
	3 313	3 330	3 352	3 382	3 396	3 388	3 406	3 410	3 442	3 475
Non-Controlling Interest	(5)	(2)	(3)	(5)	(6)	(10)	(12)	(15)	(17)	(19)
Net Income	(6)	27	136	209	324	520	637	698	763	831
* Additional General Consumers Revenue										
Percent Increase	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	2.00%	2.00%	2.00%
Cumulative Percent Increase	47.31%	53.13%	59.18%	65.47%	72.01%	78.80%	85.86%	89.58%	93.37%	97.24%
Financial Ratios										
Debt Ratio	89	89	88	87	86	84	81	79	76	72
Interest Coverage Ratio	1.00	1.02	1.10	1.16	1.25	1.40	1.51	1.58	1.65	1.74
Capital Coverage Ratio	1.31	1.36	1.53	1.64	1.75	2.09	2.16	2.26	2.33	2.43

Electric Operations 50% DSM Programs & Savings

Projected Balance Sheet

(In Millions of Dollars)

For the year ended March 31	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
ASSETS										
Plant in Service	35 822	36 544	37 410	38 124	38 859	39 555	40 581	41 337	42 409	43 537
Accumulated Depreciation	(11 096)	(11 807)	(12 532)	(13 274)	(14 030)	(14 800)	(15 585)	(16 394)	(17 219)	(18 069)
Net Plant in Service	24 725	24 737	24 878	24 849	24 828	24 754	24 997	24 943	25 190	25 468
Construction in Progress	322	344	225	254	379	572	472	663	465	255
Current and Other Assets	2 383	2 532	2 778	3 120	3 301	3 623	3 436	4 003	4 689	5 457
Goodwill and Intangible Assets	107	93	80	68	57	45	34	23	11	(0)
Regulated Assets	266	254	243	231	223	220	218	221	226	231
	27 802	27 960	28 204	28 521	28 788	29 215	29 156	29 852	30 582	31 411
LIABILITIES AND EQUITY										
Long Term Debt	22 995	23 598	23 801	23 943	23 876	23 149	23 139	23 143	23 137	22 781
Current and Other Liabilities	2 121	1 611	1 479	1 408	1 380	1 976	1 251	1 207	1 140	1 454
Contributions in Aid of Construction	764	802	839	876	914	952	990	1 029	1 069	1 109
BPIII Reserve Account	-	-	-	-	-	-	-	-	-	-
Retained Earnings	2 227	2 253	2 389	2 598	2 922	3 442	4 079	4 777	5 540	6 371
Accumulated Other Comprehensive Income	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)	(304)
	27 802	27 960	28 204	28 521	28 788	29 215	29 156	29 852	30 582	31 411

24

1 INTRODUCTION

The 2014/15 Power Resource Plan is the annual update to the long-term resource development plan to ensure that adequate resources are available to meet the electricity needs of the province of Manitoba. As the Needs For and Alternatives To (NFAT) process provided a comprehensive review resulting in approval of new major infrastructure included in the recommended development plan, the scope this year has been reduced and only provides an update in order to support the annual corporate resource and financial planning cycles. The Power Resource Plan supports the annual Integrated Financial Forecast (IFF) process as well as other long-term planning and corporate initiatives.

1.1 Resource Planning Criteria

Power resource planning is an essential activity in fulfillment of Manitoba Hydro's mission as stated in the Corporate Strategic Plan:

> "To provide for the continuance of a supply of energy to meet the needs of the province and to promote economy and efficiency in the development, generation, transmission, distribution, supply, and end-use of energy."

Resource planning is governed by Manitoba Hydro Policy P195, Generation Planning which includes the following Capacity and Energy Resource Planning criteria:

1. **Capacity Criterion**
   Manitoba Hydro will plan to carry a minimum reserve against breakdown of plant and increase in demand above forecast of 12% of the Manitoba forecast peak demand each year plus the reserve required by any export contract in effect at the time.

2. **Energy Resource Planning**
   The Corporation will plan to have adequate energy resources to supply the firm energy demand in the event that the lowest recorded coincident water supply conditions are repeated. Imports may be considered as dependable energy resources provided they utilize Firm Transmission Service and are sourced from either an Organized Power Market or a bilateral contract. The total quantity of energy considered as dependable energy from imports shall be limited to that which can be imported during the Off Peak Period, and shall not exceed the quantity of export contracts in effect at the time plus 10% of the Manitoba load.

These planning criteria provide the basis for determining when new resources are required to ensure an adequate supply of capacity and energy for Manitoba.

2 NEED FOR NEW RESOURCES TO MEET EXISTING OBLIGATIONS

The need for new resources to meet the expected load requirements is assessed using supply assumptions which include the base supply of power resources including committed resources, and the Manitoba base load forecast net of DSM and export sales requirements. Using the planning criteria, the supply demand surplus or deficit is determined for each year for 35 years into the future. The year in which persistent deficits begin for either dependable energy or peak capacity is the year that new resources are required.

Table 1 shows the changes in the dates that new resources were needed for both energy and capacity compared to the 2013 NFAT development plan with level 2 DSM, additional pipeline load and Keeyask G.S. and the new 500kV US interconnection. The variation in the date new resources are needed is due to changes in the load forecast, demand side management (DSM), and base resource assumptions such as the timing of the Pointe du Bois powerhouse rebuild, allowable import quantities, and contract obligations.

For the 2014/15 Power Resource Plan, new resources are required for capacity in 2037/38.

Table 1: Changes to Supply-Demand Balances

Changes to Dependable Energy (GW.h)					
Fiscal Year	**2036/37**	**2037/38**	**2038/39**	**2039/40**	**2040/41**
System Surplus (Deficit) 2013, Keeyask, Level 2 DSM, pipeline load	**53**	**(265)**	**(592)**	**(927)**	**(1271)**
Decrease in MB Load	1436	1456	1478	1500	1521
Decrease in DSM	(562)	(589)	(616)	(624)	(650)
Pointe du Bois Rebuild - Revised	(150)	(150)	(150)	(3)	87
Decrease in Imports due to decrease in MB Load	(112)	(85)	(83)	(87)	(86)
Other	(106)	(136)	(148)	(128)	(128)
System Surplus (Deficit) 2014, No New Resources	**559**	**232**	**(111)**	**(269)**	**(528)**

Changes to Winter Peak Capacity (MWs)					
Fiscal Year	**2036/37**	**2037/38**	**2038/39**	**2039/40**	**2040/41**
System Surplus (Deficit) 2013, Keeyask, Level 2 DSM, pipeline load	**9**	**(55)**	**(119)**	**(186)**	**(253)**
Decrease in MB Load	268	277	286	296	304
Decrease in DSM	(190)	(203)	(215)	(226)	(238)
Pointe du Bois Rebuild - Revised	(45)	(45)	(45)	42	42
Other	(4)	(4)	(4)	(5)	(5)
System Surplus (Deficit) 2014, No New Resources	**38**	**(30)**	**(98)**	**(79)**	**(149)**

Table #1 MH Export Contracts After 2015 – Dependable Capacity & Energy

Customer	Contract Name	Status	Capacity (MW)	Energy Product	Capacity Revenue	Energy Revenue	Total Revenue (Expense)
Minnesota Power	MP 250	Signed	250	5x16			
	MP Energy Exchange	Signed	0				
	MP 50	Signed	50	5x16			
	MP 133	Signed	0				
Northern States Power	NSP125	Signed	125	5x16(S) 5x12(W)			
	NSP 375/325 SPS	Signed	375(S) 325(W)	5x16(S) 5x12(W)			
	NSP 350 Div. Exchge	Signed	350	7x4 (S)			
Wisconsin Public Service	WPS 100 Product A	Signed	100	5x16			
	WPS 100 Product B	Signed	0				
	WPS 108	Signed	108	5x16			
	WPS 308	Signed	308	5x16			
Great River Energy	GRE Div. Exchange	Signed	200	7x4 (S)			
SaskPower	SaskPower 25	Signed	25	5x16			
Total					$1,239M	$4,536M	$5,776M

Table #2 MH Export Contracts After 2015 – Contracted Surplus Energy

Customer	Contract Name	Status	Surplus Energy Product	Energy Revenue
Minnesota Power	MP 250	Signed	2x16	
	MP Energy Exchange	Signed		
	MP 50	Signed	2x16	
	MP 133	Signed		
Northern States Power	NSP125	Signed		
	NSP 375/325 SPS	Signed		
	NSP 350 Div.Exchge	Signed		
Wisconsin Public Service	WPS 100 Product A	Signed	2x16	
	WPS 100 Product B	Signed		
	WPS 108	Signed		
	WPS 308	Signed	2x16	
Great River Energy	GRE Div. Exchange	Signed		
SaskPower	SaskPower 25	Signed	2x16	
Total				$971M

Table #3 MH Export Contracts After 2015 – Non-Contracted Surplus Energy Sales

Customer	Contract Name	Status	Surplus Energy Product	Energy Revenue
Minnesota Power	MP 250	Signed	*7x8*	
	MP Energy Exchange	Signed		
	MP 50	Signed	7x8	
	MP 133	Signed		
Northern States Power	NSP125	Signed	5x4 (W) 2x16 7x8	
	NSP 375/325 SPS	Signed	5x4 (W) 2x16 7x8	
	NSP 350 Div. Exchge	Signed	All but 7x4 (S)	
Wisconsin Public Service	WPS 100 Product A	Signed	7x8	
	WPS 100 Product B	Signed		
	WPS 108	Signed	2x16 7x8	
	WPS 308	Signed	7x8	
Great River Energy	GRE Div. Exchange	Signed	All but 7x4 (S)	
SaskPower	SaskPower 25	Signed		
Total				$3,463M

Table #4 MH Export Contracts After 2015 – Total Revenue

Customer	Contract Name	Status	Capacity Revenue	Energy Revenue	Total Revenue
Minnesota Power	MP 250	Signed			
	MP Energy Exchange	Signed			
	MP 50	Signed			
	MP 133	Signed			
Northern States Power	NSP125	Signed			
	NSP 375/325 SPS	Signed			
	NSP 350 Div. Exchge	Signed			
Wisconsin Public Service	WPS 100 Product A	Signed			
	WPS 100 Product B	Signed			
	WPS 108	Signed			
	WPS 308	Signed			
Great River Energy	GRE Div. Exchange	Signed			
SaskPower	SaskPower 25	Signed			
Total			$1,239M	$8,970M	$10,122M

Section:	Tab 9, App. 9.1	Page No.:	pp. 4 to 6
Topic:	Energy Supply		
Subtopic:	Export Sales		
Issue:	NEB-MISO Sales- Timing/ Make-up of MISO sales		

PREAMBLE TO IR (IF ANY):

MH's MISO sales in 2014/15 as reported to the NEB break down as follows:

	Firm Contracts (GWh)	Non-firm 5x16 (GWh)	Non-firm 2x16 (GWh)	Non-firm 7x8 (GWh)	Total MISO Sales (GWh)
Apr	280③	350①	60	0	690
May	280③	350①	144	0	774
Jun	400③	230①	270	251	1151②
Jul	460③	170①	270	366	1266②
Aug	460③	170①	270	394	1294②
Sep	300③	330①	270	58	958
Oct	180	160	0	0	340
Nov	160	390	0	0	550
Dec (forecast)	170	150④	0	0	270
Jan (forecast)	170	150④	0	0	270
Feb (forecast)	150	150④	0	0	250
Mar (forecast)	170	150④	0	0	270

① MH apparently achieved 100% of 5x16 US tie-line capacity.

② MH apparently achieved 90% of the 7x24 US-Intertie line capacity.

③ Includes Diversity Sales with zero capacity revenue

④ May include bilateral opportunity sales

165

QUESTION:

Confirm or revise the breakdown of MISO energy sales in the above table.

RATIONALE FOR QUESTION:

To assess the types of sales Manitoba Hydro can achieve in MISO.

RESPONSE:

Manitoba Hydro cannot confirm the information in the table provided. Information provided to the NEB as required by its export permits is not sales data, rather it is energy that is sourced in Canada for physical export to the US using the appropriate NEB permit. US sales are routinely greater than delivery as sales can be sourced from energy purchased in the US. As these sales are not sourced in Canada, they are not reported to the NEB as exports from Canada.

In addition the question assumes that all sales are MISO sales. This is incorrect in that MISO sales are only a portion of MH's total US sales. Lastly the question assumes that Diversity Sales were reported to the NEB as Interruptible Sales. Rather Diversity Sales are reported to the NEB under the NEB Diversity Agreement firm export permits.

Below is the revised breakdown of the US energy sales based on the NEB breakdown provided in Tab 9, App. 9.1.

The data provided in the table below is based on actual deliveries for 2014/15.

	Firm Contracts GWh	Non Firm 5 x 16 GWh	Non Firm 2 x 16 GWh	Non Firm 7 x 8 GWh
April	264	182	132	112
May	273	159	146	195
June	406	238	187	320
July	460	232	201	373
August	451	206	239	398
September	383	181	141	253
October	182	30	43	87
November	160	126	111	150
December	184	106	114	103
January	176	118	102	73
February	160	49	27	15
March	176	168	119	142

25

APPENDIX

A. DEPENDABLE SUPPLY & DEMAND

System Firm Winter Peak Demand and Capacity Resources (MW) @ generation
2014/15 PRP
No New Resources

Fiscal Year	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Power Resources																		
New Power Resources																		
New Hydro																		
Conawapa																		
Keeyask						90	630	630	630	630	630	630	630	630	630	630	630	630
1 **Total New Hydro**						90	630	630	630	630	630	630	630	630	630	630	630	630
New Thermal																		
SCGT																		
CCGT																		
2 **Total New Thermal**																		
New NUG PPA																		
Contracted																		
Proposed			12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
3 **Total New NUG PPA**			12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4 **Total New Power Resources** 1+2+3			**12**	**12**	**12**	**102**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**
Base Supply Power Resources																		
Existing Hydro	5 133	5 172	5 164	5 190	5 195	5 196	5 181	5 172	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167
Existing Thermal																		
Brandon Coal - Unit 5	105	105	105	105	105													
Selkirk Gas		66	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Brandon Units 6-7 SCGT	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
Contracted Imports	605	605	605	605	605	605	605	605	605	605	605	220	220	220	220	220		
Proposed Imports																		
Pointe du Bois Rebuild																		
Bipole III Reduced Losses					90	90	80	80	80	80	80	80	80	80	80	80	80	80
5 **Total Base Supply Power Resources**	**6 123**	**6 228**	**6 286**	**6 312**	**6 407**	**6 303**	**6 278**	**6 269**	**6 264**	**6 264**	**6 264**	**5 879**	**5 879**	**5 879**	**5 879**	**5 879**	**5 659**	**5 659**
6 **Total Power Resources** 4+5	**6 123**	**6 228**	**6 298**	**6 324**	**6 419**	**6 405**	**6 920**	**6 911**	**6 906**	**6 906**	**6 906**	**6 521**	**6 521**	**6 521**	**6 521**	**6 521**	**6 301**	**6 301**
Peak Demand																		
2014 Base Load Forecast	4 716	4 803	4 861	4 985	5 068	5 166	5 223	5 284	5 342	5 400	5 458	5 516	5 574	5 632	5 690	5 748	5 808	5 869
Less: 2014 DSM Forecast	- 60	- 111	- 169	- 226	- 293	- 353	- 406	- 449	- 475	- 498	- 517	- 533	- 550	- 566	- 582	- 585	- 589	- 592
7 **Manitoba Net Load**	4 656	4 692	4 692	4 759	4 775	4 813	4 817	4 835	4 867	4 902	4 941	4 983	5 024	5 066	5 108	5 163	5 219	5 277
Contracted Exports	726	484	724	724	559	559	779	908	880	880	880	385	385	275	275	275	275	275
Proposed Exports																		
8 **Total Exports**	726	484	724	724	559	559	779	908	880	880	880	385	385	275	275	275	275	275
9 **Total Peak Demand** 7+8	**5 382**	**5 176**	**5 416**	**5 483**	**5 334**	**5 372**	**5 596**	**5 743**	**5 747**	**5 782**	**5 821**	**5 368**	**5 409**	**5 341**	**5 383**	**5 438**	**5 494**	**5 552**
10 Reserves	513	563	563	571	573	577	578	580	584	588	593	598	603	608	613	620	626	633
11 **System Surplus** 6-9-10	**228**	**489**	**319**	**270**	**512**	**456**	**746**	**588**	**575**	**536**	**492**	**555**	**509**	**572**	**525**	**463**	**181**	**116**

System Firm Winter Peak Demand and Capacity Resources (MW) @ generation
2014/15 PRP
No New Resources

Fiscal Year		2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa																			
Keeyask		630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630
1 **Total New Hydro**		630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630	630
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New NUG PPA																			
Contracted																			
Proposed		12	12	12	12														
3 **Total New NUG PPA**		12	12	12	12														
4 **Total New Power Resources**	1+2+3	642	642	642	642	630	630	630	630	630	630	630	630	630	630	630	630	630	630
Base Supply Power Resources																			
Existing Hydro		5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167
Existing Thermal																			
Brandon Coal - Unit 5																			
Selkirk Gas		132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Brandon Units 6-7 SCGT		280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
Contracted Imports																			
Proposed Imports																			
Pointe du Bois Rebuild									87	87	87	87	87	87	87	87	87	87	87
Bipole III Reduced Losses		80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
5 **Total Base Supply Power Resources**		5 659	5 659	5 659	5 659	5 659	5 659	5 659	5 746	5 746	5 746	5 746	5 746	5 746	5 746	5 746	5 746	5 746	5 746
6 **Total Power Resources**	4+5	6 301	6 301	6 301	6 301	6 289	6 289	6 289	6 376	6 376	6 376	6 376	6 376	6 376	6 376	6 376	6 376	6 376	6 376
Peak Demand																			
2014 Base Load Forecast		5 931	5 995	6 058	6 122	6 185	6 249	6 313	6 376	6 440	6 504	6 567	6 631	6 694	6 758	6 822	6 885	6 949	7 012
Less: 2014 DSM Forecast		- 594	- 596	- 598	- 601	- 604	- 607	- 610	- 613	- 614	- 614	- 615	- 615	- 615	- 615	- 615	- 615	- 615	- 615
7 **Manitoba Net Load**		5 337	5 399	5 460	5 521	5 581	5 642	5 703	5 763	5 826	5 890	5 952	6 016	6 079	6 143	6 207	6 270	6 334	6 397
Contracted Exports		275	275	275															
Proposed Exports																			
8 **Total Exports**		275	275	275															
9 **Total Peak Demand**	7+8	5 612	5 674	5 735	5 521	5 581	5 642	5 703	5 763	5 826	5 890	5 952	6 016	6 079	6 143	6 207	6 270	6 334	6 397
10 Reserves		640	648	655	663	670	677	684	692	699	707	714	722	729	737	745	752	760	768
11 **System Surplus**	6-9-10	49	- 21	- 89	117	38	- 30	- 98	- 79	- 149	- 221	- 290	- 362	- 432	- 504	- 576	- 646	- 718	- 789

System Firm Energy Demand and Dependable Resources (GWh) @ generation
2014/15 PRP
No New Resources

Fiscal Year		2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Power Resources																			
New Power Resources																			
New Hydro																			
Conawapa																			
Keeyask							493	2 974	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003
1 **Total New Hydro**							**493**	**2 974**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**	**3 003**
New Thermal																			
SCGT																			
CCGT																			
2 **Total New Thermal**																			
New Nug PPA																			
Contracted																			
Proposed				97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97
3 **Total New Nug PPA**				**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**	**97**
4 New Wind																			
5 **Total New Power Resources**	1+2+3+4			**97**	**97**	**97**	**590**	**3 071**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**	**3 100**
Base Supply Power Resources																			
Existing Hydro		21 928	21 924	21 892	21 878	21 880	21 863	21 816	21 775	21 743	21 743	21 733	21 723	21 723	21 713	21 703	21 703	21 693	21 693
Existing Thermal																			
Brandon Coal - Unit 5		811	811	811	811	811	592												
Selkirk Gas		953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
Brandon Units 6-7 SCGT		2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354
Contracted Imports		2 730	2 485	2 575	2 575	2 575	2 575	3 502	3 688	3 688	3 688	3 688	2 321	2 050	2 050	2 050	2 050	1 268	1 113
Proposed Imports																			
Hydro Adjustment		373	784	844	844	844	844	844	844	844	844	844	406	307	307	307	307	70	
Market Purchases		337	583	493	493	493	493	958	1 050	1 050	1 050	1 050	2 417	2 671	2 283	2 226	2 259	2 911	3 100
Existing Wind		771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771
Pointe du Bois Rebuild																			
Bipole III Reduced Losses						101	101	177	177	177	177	177	177	177	177	177	177	177	177
6 **Total Base Supply Power Resources**		**30 257**	**30 665**	**30 693**	**30 679**	**30 782**	**30 546**	**31 375**	**31 612**	**31 580**	**31 580**	**31 570**	**31 122**	**31 006**	**30 608**	**30 541**	**30 574**	**30 197**	**30 161**
7 **Total Power Resources**	5+6	**30 257**	**30 665**	**30 789**	**30 775**	**30 878**	**31 135**	**34 446**	**34 712**	**34 680**	**34 680**	**34 670**	**34 221**	**34 105**	**33 707**	**33 640**	**33 673**	**33 297**	**33 261**
Manitoba Domestic Load																			
2014 Base Load Forecast		25 639	26 130	26 436	27 174	27 662	28 247	28 583	28 937	29 284	29 626	29 970	30 316	30 659	31 006	31 352	31 703	32 061	32 424
Construction Power - Hydro			110	110	110	110	110	83											
Less: 2014 DSM Forecast		- 283	- 487	- 780	-1 056	-1 407	-1 730	-1 988	-2 183	-2 296	-2 405	-2 487	-2 562	-2 637	-2 717	-2 797	-2 825	-2 851	-2 874
8 **Manitoba Net Load**		**25 356**	**25 753**	**25 766**	**26 228**	**26 365**	**26 627**	**26 678**	**26 754**	**26 988**	**27 221**	**27 483**	**27 754**	**28 022**	**28 289**	**28 555**	**28 878**	**29 210**	**29 550**
Contracted Exports		3 421	2 631	3 247	3 367	3 166	3 125	3 951	4 604	4 503	4 476	4 476	2 193	2 049	1 634	1 551	1 551	1 389	1 389
Proposed Exports																			
Less: Adverse Water			- 309	- 370	- 370	- 370	- 370	- 370	- 489	- 512	- 512	- 512	- 85						
9 **Total Net Exports**		**3 421**	**2 322**	**2 877**	**2 997**	**2 796**	**2 755**	**3 581**	**4 115**	**3 991**	**3 964**	**3 964**	**2 108**	**2 049**	**1 634**	**1 551**	**1 551**	**1 389**	**1 389**
10 **Total Energy Demand**	8+9	**28 777**	**28 075**	**28 643**	**29 225**	**29 161**	**29 382**	**30 259**	**30 869**	**30 979**	**31 185**	**31 447**	**29 862**	**30 071**	**29 923**	**30 106**	**30 429**	**30 599**	**30 939**
11 **System Surplus**	7-10	**1 481**	**2 590**	**2 146**	**1 551**	**1 718**	**1 753**	**4 187**	**3 843**	**3 701**	**3 495**	**3 223**	**4 359**	**4 034**	**3 784**	**3 534**	**3 244**	**2 698**	**2 322**

26

Section:	Tab 9	Page No.:	Page 22
Topic:	Total Hydraulic Generation and Net Revenues		
Subtopic:			
Issue:			

PREAMBLE TO IR (IF ANY):

QUESTION:

Please file an updated version of the schedule provided in MIPUG/MH I-35a from the 2012/13 & 2013/14 GRA and the supporting analysis from Figure 9.13 for the Average Hydraulic Energy including corresponding net revenues.

RATIONALE FOR QUESTION:

To review financial risks to Hydro over the near and longer term.

RESPONSE:

Table 1 provides the hydraulic energy and net revenue associated with each of the 102 historical flow years (representing historic flow years 1912/13 to 2013/14, inclusive) for the 2016/17 load year. The variation of net revenue for a specific flow year with respect to the average net revenue from all flow cases is also provided. The values in the table are based on the 2014 Load Forecast, and the 2014 forecast of export and import prices, as well as all other updates for the 2014 IFF.

The net revenue represents the revenues minus costs. Revenues are inclusive of firm and opportunity export sales and transmission inter-connection revenues. Costs are inclusive of water rentals for Manitoba Hydro hydraulic energy generation, costs of Manitoba Hydro thermal generation, import and wind energy purchases, and transmission inter-connection costs.

The revenues and costs are reflected in Manitoba Hydro's Integrated Financial Forecast Statement of Income. Revenues are reflected in the Extra-provincial Revenue, while the costs are reflected in the Water Rentals & Assessments and the Fuel & Power Purchased.

Table 2 includes the actual and average annual total hydraulic generation for fiscal years 1992/93 through 2013/14 provided in Figure 9.13. There was no net revenues analysis associated with the Average Hydraulic Energy shown in this figure.

Table 1. Hydraulic Energy and Net Revenue Variation with Flow Year

Flow Year	Annual System Inflow	MH Hydraulic Energy	Net Revenue	Variation of Net Revenue from Average
	Kcfs	(TWh/yr)	(M $Cdn)	(M $Cdn)
1912/13	112	32.9	226	74
1913/14	119	32.6	217	66
1914/15	98	28.3	95	-56
1915/16	105	30.4	165	13
1916/17	137	36.2	312	161
1917/18	119	34.1	261	110
1918/19	105	29.9	148	-3
1919/20	98	27.4	57	-95
1920/21	103	29.1	119	-32
1921/22	114	31.5	188	37
1922/23	106	29.6	140	-12
1923/24	112	31.1	175	23
1924/25	99	26.7	28	-123
1925/26	120	32.6	217	66
1926/27	111	31.2	185	33
1927/28	155	37.5	325	174
1928/29	114	33.6	248	97
1929/30	87	25.1	-37	-189
1930/31	89	24.5	-69	-221
1931/32	87	24.0	-94	-245
1932/33	95	26.4	18	-134
1933/34	101	27.8	79	-72
1934/35	119	32.7	222	70
1935/36	118	32.4	213	62
1936/37	96	26.6	25	-127
1937/38	99	27.7	69	-83
1938/39	89	25.6	-16	-167
1939/40	79	22.3	-203	-354
1940/41	55	20.2	-349	-500
1941/42	92	21.5	-261	-413
1942/43	101	29.0	117	-35
1943/44	108	30.7	163	11
1944/45	107	30.4	149	-2
1945/46	119	32.5	216	64
1946/47	113	32.2	205	54
1947/48	126	34.0	258	107
1948/49	113	32.9	219	67
1949/50	116	31.0	176	24
1950/51	144	35.7	293	141
1951/52	132	36.4	315	164
1952/53	107	32.1	202	51
1953/54	124	33.6	248	97
1954/55	143	37.3	335	183
1955/56	133	35.5	279	128
1956/57	119	33.1	228	77
1957/58	111	31.6	186	35
1958/59	96	26.6	26	-125
1959/60	137	34.9	282	130
1960/61	102	29.6	135	-16
1961/62	75	21.4	-278	-430
1962/63	119	32.1	201	49
1963/64	111	31.0	183	31
1964/65	113	31.6	193	41
1965/66	157	37.2	334	183
1966/67	151	36.2	300	149
1967/68	115	33.1	223	71
1968/69	133	33.9	256	105
1969/70	148	37.8	335	184
1970/71	145	36.8	319	168
1971/72	139	36.1	305	153
1972/73	126	34.8	261	109
1973/74	115	31.8	195	44
1974/75	164	36.7	310	158
1975/76	139	36.0	296	145
1976/77	92	26.1	-12	-163
1977/78	99	26.5	26	-125
1978/79	122	33.2	238	86
1979/80	135	34.0	239	88
1980/81	93	25.4	-24	-176
1981/82	85	23.7	-110	-262
1982/83	115	31.6	183	32
1983/84	110	30.0	150	-2
1984/85	101	27.9	80	-72
1985/86	136	34.5	267	116
1986/87	125	34.3	249	97
1987/88	82	22.7	-181	-333
1988/89	72	20.4	-334	-486
1989/90	91	25.5	-22	-173
1990/91	85	25.0	-47	-198
1991/92	91	26.2	7	-144
1992/93	115	31.3	177	26
1993/94	106	29.9	136	-16
1994/95	102	28.8	96	-55
1995/96	103	29.5	133	-18
1996/97	141	35.2	275	123
1997/98	151	36.6	316	165
1998/99	106	30.2	127	-25
1999/00	110	30.7	160	9
2000/01	126	33.3	238	87
2001/02	126	33.2	210	58
2002/03	104	28.7	104	-47
2003/04	72	20.9	-317	-468
2004/05	141	34.7	281	130
2005/06	175	38.5	366	214
2006/07	113	31.9	179	27
2007/08	150	36.6	313	161
2008/09	141	36.7	315	164
2009/10	151	36.3	300	149
2010/11	162	38.4	355	204
2011/12	153	35.7	277	125
2012/13	121	33.4	242	90
2013/14	134	35.7	287	135
Average	115	31.1	151.43	0

Table 2. Actual Hydraulic Generation

Fiscal Year	Generation (TWh)
1992/93	27.6
1993/94	27.2
1994/95	27.9
1995/96	29.1
1996/97	31.7
1997/98	33.8
1998/99	29.1
1999/00	29.5
2000/01	31.8
2001/02	32.2
2002/03	28.6
2003/04	18.5
2004/05	31.1
2005/06	37.2
2006/07	31.6
2007/08	34.9
2008/09	34.2
2009/10	33.8
2010/11	34.0
2011/12	33.2
2012/13	33.1
2013/14	35.3
Average	31.2

Section:	Tab 9	Page No.:	MIPUG/MH I-8 MIPUG/MH I-9
Topic:	Energy Supply		
Subtopic:	Drought		
Issue:	Net Revenue Reductions		

PREAMBLE TO IR (IF ANY):

MIPUG/MH I-8 and I-9 indicate the net revenue reductions of a 5 year/7 year drought in 2016/17 and of historical events.

QUESTION:

d) Does MH see a $1.5 to 2.0 Billion drought reserve as an adequate component of Retained Earnings? Explain in the context of the 1921/30 to 1942/43 extended low flow period.

RATIONALE FOR QUESTION:

To explore drought risk.

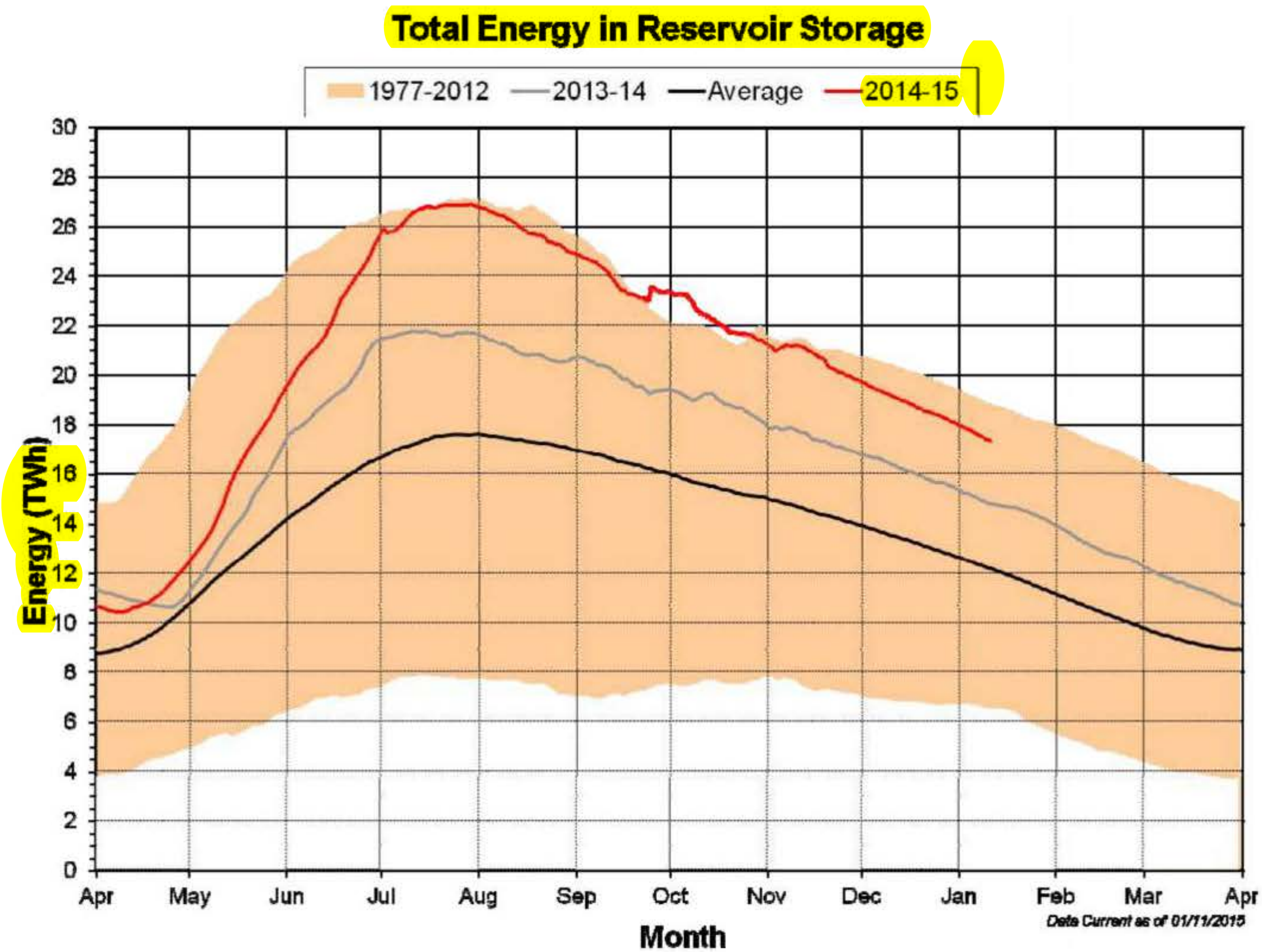
RESPONSE:

Manitoba Hydro assumes the time period 1929/30 to 1942/43 was intended in the question and has extended it an additional year to 1943/44 to continue to the end of the 20 year forecast in 2033/34 for the purposes of this response.

The sequence of 1929/30 to 1943/44 flow years commencing in load year 2016/17 through to 2033/34 results in net revenues that would be approximately $4 billion lower than the average revenues for all flow years over the 20-year forecast period. Retained earnings at the $1.5 to $2.0 billion level would clearly not be sufficient and would result in the requirement for significant rate increases to customers.

However, the fourteen year period from 1929/30 to 1942/43 represents the most severe extended low flow period in Manitoba Hydro's flow record and has a very low likelihood of reoccurrence.

Chart (b) - Energy in Storage



27

180

Section:	Tab 9	**Page No.:**	Page 22-23
Topic:	Financial Impact of Drought		
Subtopic:			
Issue:			

PREAMBLE TO IR (IF ANY):

QUESTION:

In a format similar to MIPUG/MH I-36a from the 2012/13 & 2013/14 GRA, please provide the schedules regarding the five year and seven year drought impacts.

RATIONALE FOR QUESTION:

To review financial risks to Hydro over the near and longer term.

RESPONSE:

Manitoba Hydro's methodology for the calculation of the drought impact is based on the difference in net revenues over the flow years of a representative drought with respect to the net revenues based on the average of all flow cases. The flow years, 1987/88 to 1991/92, inclusive, constitutes the representative 5-year drought. Flow years, 1936/37 to 1942/43, inclusive, make up the representative 7-year drought.

The attached table provides the revenue and cost impacts (excluding financing costs) for these two representative droughts with onset of the drought in 2016/17.

	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Impact of 5-Year Drought on Revenues (millions of $ CDN)						
Revenue						
Extra-Provincial Sales	-175	-171	-174	-161	-129	-809
Expense						
Water Rental	-28	-35	-19	-21	-18	-120
Fuel & Power Purchase	186	364	51	110	66	777
Net Revenue	-333	-500	-206	-250	-177	-1466
(Excluding Finance Expense)						
Impact of 5-Year Drought on Energy (GWh/yr)						
Extra-Provincial Sales	-4008	-3787	-3688	-3299	-2718	-17500
Hydro Generation	-8354	-10426	-5767	-6176	-5327	-36049
Fuel & Power Purchase	3702	5812	1637	2420	2226	15797

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
Impact of 7-Year Drought on Revenues (millions of $ CDN)								
Revenue								
Extra-Provincial Sales	-131	-101	-162	-209	-202	-227	-80	-1112
Expense								
Water Rental	-15	-11	-19	-30	-40	-36	-8	-159
Fuel & Power Purchase	10	-2	51	251	468	379	-7	1149
Net Revenue	-127	-88	-195	-430	-630	-570	-64	-2103
(Excluding Finance Expense)								
Impact of 7-Year Drought on Energy (GWh/yr)								
Extra-Provincial Sales	-3299	-2628	-3533	-3967	-3610	-3875	-1939	-22851
Hydro Generation	-4483	-3404	-5597	-8837	-11817	-10805	-2540	-47482
Fuel & Power Purchase	820	496	1638	4189	7349	6149	386	21027

The tables below are split by season. Summer season consists of the months May to October. Winter season consists of the months April and November to March. The split was done this way so as to still tie to the fiscal year numbers provided previously.

Table 3

	EXPORT REVENUES																	
	2008/09			2009/10			2010/11			2011/12			2012/13			2013/14		
	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price	GWh	$M (Cdn)	Avg Price
Opportunity Bilateral Winter	357	29	70.79	489	18	38.30	970	26	27.15	685	21	29.39	658	24	36.36	508	22	42.38
Opportunity Bilateral Summer	948	72	71.57	2139	42	19.95	881	26	29.87	1238	29	23.55	1042	30	28.65	963	31	32.67
Market Winter																		
Day Ahead	1087	41	37.80	1435	33	23.11	946	17	17.77	473	8	15.34	363	10	25.59	608	8	36.27
Real Time	322	20	53.81	771	32	32.17	846	23	25.59	734	18	22.44	393	10	27.66	422	13	45.51
Market Summer																		
Day Ahead	2953	81	27.58	1676	26	15.64	2287	52	22.88	2247	44	19.41	2184	43	19.56	3643	101	23.89
Real Time	368	40	48.31	1087	39	23.97	1037	37	27.76	1125	32	23.74	810	26	25.21	914	19	24.81
Merchant Winter	720	38	48.36	361	12	30.96	275	10	33.20	118	5	22.37	61	3	33.46	202	28	80.90
Merchant Summer	878	48	47.84	414	14	25.98	437	17	39.27	318	12	34.79	89	6	34.66	129	5	28.68

2014/15 is to end of Dec/14

Table 4

	Fuel and Power Purchased													
	2008/09		2009/10		2010/11		2011/12		2012/13		2013/14		2014/15	
	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)	GWh	$M (Cdn)
System Merchant Winter	720	36	359	12	275	8	118	3	61	2	202	15	169	5
System Merchant Summer	878	44	416	13	437	16	318	11	89	4	129	4	240	6
Power Purchases Winter	575	40	833	27	494	17	906	43	942	43	1233	66	382	23
Power Purchases Summer	406	17	487	6	660	17	728	36	642	28	591	32	451	33
Transmission Charges Winter		13		16		16		18		19		20		10
Transmission Charges Summer		8		17		20		21		25		25		27
Fuel Purchases Winter		10		10		8		8		7		10		2
Fuel Purchases Summer		8		3		4		6		5		4		4

2014/15 is to end of Dec/14

Section:	Tab 9	Page No.:	MIPUG/MH I-8 MIPUG/MH I-9
Topic:	Energy Supply		
Subtopic:	Drought		
Issue:	Net Revenue Reductions		

PREAMBLE TO IR (IF ANY):

MIPUG/MH I-8 and I-9 indicate the net revenue reductions of a 5 year/7 year drought in 2016/17 and of historical events.

QUESTION:

a) Confirm that the 5 year and 7 year droughts depicted in MIPUG/MH I-8 reflect the following specific historical time periods:

- 5 year drought 1987/88 to 1991/92
- 7 year drought 1936/37 to 1942/43.

b) Confirm that both the 5 year and 7 year drought starting in 2016/17 reflect average lost sales and average incremental energy purchases at approximately 5¢/kWh.

c) Confirm that MH assumes no pricing premium in the MISO market during drought events.

RATIONALE FOR QUESTION:

To explore drought risk.

RESPONSE:

a) Confirmed.

b) Based on the data presented in MIPUG/MH-I-8, the average unit value of the combined effect of export sales and fuel & power purchases is approximately equal to:

- 5-year drought: 4.8¢/kWh
- 7-year drought 5.2¢/kWh

c) Manitoba Hydro's production costing analysis of drought events does not assume an increase in overall MISO market prices. A reduction in annual hydro generation in the order of 10,000 GWh in a severe drought is small in comparison to the annual energy demand in MISO, excluding the southern zones, of around 500,000 GWh. Manitoba Hydro's production costing analysis does account for increasing unit costs of imports as the volume of imports increases as a result of imports occurring in higher priced hours.

SUBJECT: Export Revenue

REFERENCE: Chapter 4; 2012 GRA PUB/MH I-018(a), PUB/MH II-012(a)

QUESTION:

Please update the charts provided in response to PUB/MH I-018(a) and PUB/MH II-012(a) from the 2012 GRA to include 2013 data. Please add another section to PUB/MH I-018(a) that shows total possible generation resources, at nameplate capacity (for wind, assume 35% of nameplate capacity), in TWh/yr.

RESPONSE:

Update to PUB/MH I-018(a) and PUB/MH II-012(a) from the 2012 GRA:

Generation by fuel type as reported in MISO Monthly Reports (TWh)								
	Coal	Gas, Oil/Gas	Hydro	Nuclear	Oil	Wind	Imports into MISO Region (Total)	Manitoba Hydro Physical Exports to the US
*Year to end July 2013	194	19	2	33	1	22		4.3
2012	323	44	4	63	3	33	37.7	8.0
2011	436	32	5	78	2	29	40.3	9.3
2010	490	25	4	93	2	24	28.0	9.1
2009	453	15	2	82	1	16	26.3	9.2
2008	463	22	2	69	0	4	27.2	9.9

Manitoba Hydro notes that the following two significant footprint changes have impacted the data and hinder year to year comparison:

1. First Energy left MISO in June 2011
2. Duke Energy left MISO in January 2012.

Please see table below for additional section requested.

Maximum Annual Theoretical Energy Potential				
Type of Resource	Fraction of Total Capacity	Estimated Capacity (MW)	Assumed Capacity Factor	Maximum Annual Theoretical Energy Potential (TWh)
Coal	48%	69,007	90%	544
Nuclear	6%	8,626	90%	68
Gas/ Oil	32%	46,005	90%	363
Renewables	14%	20,127	35%	62
Total		143,765		1036

Note: Estimated capacity based on Appendix 5.1 – MISO Corporate Fact Sheet July 2012.

28

Section:	App. 11.7	Page No.:	P3.
Topic:	Corporate Risk Management Report		
Subtopic:	Infrastructure Risk		
Issue:	Prolonged Loss of Supply		

PREAMBLE TO IR (IF ANY):

MH has indicated that the potential financial impact of a prolonged loss of supply is greater than $2 billion.

QUESTION:

a) Provide the analysis of specific infrastructure failure of generation or transmission failure that could result in a $2 billion financial impact.

b) Separately indicate the cost of restoring the infrastructure in service and the lost revenues associated with the failure.

RATIONALE FOR QUESTION:

To understand how the $2 billion financial impact was determined.

RESPONSE:

a) As per the attached response to CAC/MSOS/MH II–111(a) from the 2010/11 & 2011/12 GRA, the potential financial impact of greater than $2 billion is based on a scenario where a major facility was out of service for an extended period resulting in a loss of generation and the need to purchase imported power and fuel to meet firm commitments. This resulted in a reduction to net export revenues, increased power and fuel costs and reduced water rental. The impact increases to above $2.0 billion over the next ten years due to financing costs. The IFF risk scenario is provided in Attachment 2 of CAC/MSOS/MH II-111(a).

b) The scenario discussed in response to CAC/MSOS/MH II-111a) from the 2010/11 & 2011/12 GRA assumes a zero cost of restoring the infrastructure and a reduction of $.2 billion in net export revenues. The major other costs are $1.0 billion for increased power and fuel and $1.0 billion for financing.

Section:	App. 11.7	Page No.:	Pg. 3, Pg.21
Topic:	Corporate Risk Management Report		
Subtopic:	Loss of Export Market Access		
Issue:	MISO Rule Changes		

PREAMBLE TO IR (IF ANY):

MH has indicated a potential financial impact of loss of export market access of greater than 30% of electricity revenues.

QUESTION:

a) Confirm that this risk also includes possible MISO rule changes alluded to on page 21.

b) Please indicate to what extent the risk of lost market access relates to long-term firm contracts versus day-ahead or real-time MISO market sales and quantify the financial impact by sale type.

RATIONALE FOR QUESTION:

To explore risk related to export market access.

RESPONSE:

a) Confirmed. Corporate risk profile A.2.1 Export Regulatory Environment, as referenced on page 21 of Appendix 11.7 of the Application, pertains to regulatory and industry business environment barriers that could limit access to both US and Canadian power markets. Therefore, the Export Regulatory Environment risk includes any power market rules changes, in Canada or the US, including MISO rule changes, which would limit Manitoba Hydro's access to power markets.

b) Corporate risk profile A.2.1 Export Regulatory Environment pertains to long-term firm contracts, day-ahead and real-time MISO market sales, including real time sales to Canadian markets. The potential financial impact of > 30% of electricity revenue for a loss of export market access as stated on page 3 of Appendix 11.7 pertains to a very low probability event that results in a complete loss of all export markets on all time horizons.

29

Export & Domestic Revenues MFR 2

File latest Power Resource Plans based on NFAT Plan 5 (2013/14 and 2014/15) Supply and Demand Tables:

- **system power demand (MW) and dependable energy resources (GWh)/average energy resources at generation**
- **system firm winter peak demand and capacity resources (MW) at generation**
- **new system firm summer peak demand and capacity resources (MW) at generation**

A summary system firm winter peak demand and capacity resources (MW) for the years 2014/15 to 2033/34 is provided in Figure 1.

A summary of system firm energy demand and dependable resources (GWh) for the years 2014/15 to 2033/34 is provided in Figure 2.

A summary of System Firm Energy Demand and Resources (GWh) @ generation including 2014/15 at expected water flow conditions, 2015/16 at median water flow conditions and 2016/17 to 2033/34 at the average of all water flow conditions is provided in Figure 3. Please note that the 2014 Base Load Forecast and 2014 Base DSM Forecast entries were corrected for 2014/15 and 2015/16 versus what was included in Figure 9.3 of Tab 9 filed in January 23, 2015.

Manitoba Hydro does not have summer peak demand and capacity tables as requested for the 20 year forecast. As agreed to between Manitoba Hydro and advisors to the PUB, Manitoba Hydro has provided a summary of peak demand and capacity resources (MW) for the months of July 2015 and July 2016 in Figure 4. Surplus capacity in Figure 4 was evaluated consistent with MISO practices.

Figure 1: System Firm Winter Peak Demand and Capacity Resources (MW) @ generation

	Fiscal Year		2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
	Manitoba Hydro Power Resources																					
	New Hydro																					
	Keeyask G.S.							90	630	630	630	630	630	630	630	630	630	630	630	630	630	630
	Total New Hydro							90	630	630	630	630	630	630	630	630	630	630	630	630	630	630
	New NUG Purchase				12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
1	**Total New Power Resources**				**12**	**12**	**12**	**102**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**	**642**
	Existing Hydro		5 133	5 172	5 164	5 190	5 195	5 196	5 181	5 172	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167	5 167
	Existing Thermal																					
	Brandon Unit 5		105	105	105	105	105															
	Selkirk Gas			66	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
	Brandon Units 6-7 SCGT		280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
	Total Existing Thermal		385	451	517	517	517	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412
	Imports		605	605	605	605	605	605	605	605	605	605	605	220	220	220	220	220				20
	Bipole III Line Reduction						90	90	80	80	80	80	80	80	80	80	80	80	80	80	80	80
2	**Total Base Supply Power Resources**		**6 123**	**6 228**	**6 286**	**6 312**	**6 407**	**6 303**	**6 278**	**6 269**	**6 264**	**6 264**	**6 264**	**5 879**	**5 879**	**5 879**	**5 879**	**5 879**	**5 659**	**5 659**	**5 659**	**5 679**
3	**Total Power Resources**	**1+2**	**6 123**	**6 228**	**6 298**	**6 324**	**6 419**	**6 405**	**6 920**	**6 911**	**6 906**	**6 906**	**6 906**	**6 521**	**6 521**	**6 521**	**6 521**	**6 521**	**6 301**	**6 301**	**6 301**	**6 321**
	Peak Demand																					
	2014 Base Load Forecast		4 716	4 803	4 861	4 985	5 068	5 166	5 223	5 284	5 342	5 400	5 458	5 516	5 574	5 632	5 690	5 748	5 808	5 869	5 931	5 995
	Less: 2014 Base DSM Forecast		- 60	- 111	- 169	- 226	- 293	- 353	- 406	- 449	- 475	- 498	- 517	- 533	- 550	- 566	- 582	- 585	- 589	- 592	- 594	- 596
4	**Manitoba Net Load**		**4 656**	**4 692**	**4 692**	**4 759**	**4 775**	**4 813**	**4 817**	**4 835**	**4 867**	**4 902**	**4 941**	**4 983**	**5 024**	**5 066**	**5 108**	**5 163**	**5 219**	**5 277**	**5 337**	**5 399**
	Contracted Exports		726	484	724	724	559	559	779	908	880	880	880	385	385	275	275	275	275	275	275	275
	Proposed Exports																					
5	**Total Exports**		**726**	**484**	**724**	**724**	**559**	**559**	**779**	**908**	**880**	**880**	**880**	**385**	**385**	**275**	**275**	**275**	**275**	**275**	**275**	**275**
6	**Total Peak Demand**	**4+5**	**5 382**	**5 176**	**5 416**	**5 483**	**5 334**	**5 372**	**5 596**	**5 743**	**5 747**	**5 782**	**5 821**	**5 368**	**5 409**	**5 341**	**5 383**	**5 438**	**5 494**	**5 552**	**5 612**	**5 674**
7	Reserves		513	563	563	571	573	577	578	580	584	588	593	598	603	608	613	620	626	633	640	648
	System Surplus	**3-6-7**	**228**	**489**	**319**	**270**	**512**	**456**	**746**	**588**	**575**	**536**	**492**	**556**	**509**	**572**	**525**	**464**	**181**	**116**	**49**	**(0)**

Figure 2: System Firm Energy Demand and Dependable Resources (GWh) @ generation

	Fiscal Year		2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
	Manitoba Hydro Power Resources																					
	New Hydro																					
	Keeyask							493	2 974	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003
	Total New Hydro							493	2 974	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003	3 003
	New NUG Purchase				97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97
1	**Total New Power Resources**				97	97	97	590	3 071	3 100	3 100	3 100	3 100	3 100	3 100	3 100	3 100	3 100	3 100	3 100	3 100	3 100
	Existing Hydro		21 928	21 924	21 892	21 878	21 880	21 863	21 816	21 775	21 743	21 743	21 733	21 723	21 723	21 713	21 703	21 703	21 693	21 693	21 683	21 673
	Existing Thermal																					
	Brandon Unit 5		811	811	811	811	811	592														
	Selkirk Gas		953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953	953
	Brandon Units 6-7 SCGT		2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354	2 354
	Total Existing Thermal		4 118	4 118	4 118	4 118	4 118	3 899	3 307	3 307	3 307	3 307	3 307	3 307	3 307	3 307	3 307	3 307	3 307	3 307	3 307	3 307
	Imports		3 440	3 852	3 912	3 912	3 912	3 912	5 304	5 582	5 582	5 582	5 582	5144	5028	4640	4583	4616	4250	4214	4249	4285
	Existing Wind		771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771	771
	Bipole III Reduced Losses						101	101	177	177	177	177	177	177	177	177	177	177	177	177	177	177
2	**Total Base Supply Power Resources**		30 257	30 665	30 698	30 679	30 782	30 546	31 375	31 612	31 580	31 580	31 570	31 122	31 006	30 608	30 541	30 574	30 198	30 162	30 187	30 213
3	**Total Power Resources**	1+2	30 257	30 665	30 790	30 776	30 878	31 136	34 446	34 711	34 680	34 680	34 670	34 222	34 106	33 708	33 641	33 674	33 298	33 262	33 287	33 313
	Demand																					
	2014 Base Load Forecast		25 639	26 130	26 436	27 174	27 662	28 247	28 583	28 937	29 284	29 626	29 970	30 316	30 659	31 006	31 352	31 703	32 061	32 424	32 796	33 177
	Construction Power - Hydro			110	110	110	110	110	83													
	Less: 2014 Base DSM Forecast		- 283	- 487	- 780	-1 056	-1 407	-1 730	-1 988	-2 183	-2 296	-2 405	-2 487	-2 562	-2 637	-2 717	-2 797	-2 825	-2 851	-2 874	-2 895	-2 912
4	**Net Load**		25 356	25 753	25 766	26 228	26 365	26 627	26 678	26 754	26 988	27 221	27 484	27 754	28 022	28 289	28 555	28 879	29 210	29 550	29 902	30 264
	Contracted Exports		3 421	2 632	3 246	3 366	3 165	3 125	3 951	4 603	4 503	4 476	4 476	2 193	2 049	1 634	1 551	1 551	1 389	1 389	1 389	1 389
	Proposed Exports																					
	Less: Total Adverse Water			- 309	- 370	- 370	- 370	- 370	- 370	- 489	- 513	- 513	- 513	- 85								
5	**Total Net Exports**		3 421	2 323	2 876	2 995	2 795	2 754	3 580	4 114	3 990	3 963	3 963	2 108	2 049	1 634	1 551	1 551	1 389	1 389	1 389	1 389
6	**Total Demand**	4+5	28 776	28 076	28 642	29 224	29 160	29 381	30 258	30 868	30 978	31 184	31 447	29 862	30 071	29 923	30 106	30 430	30 599	30 939	31 291	31 654
	System Surplus	3-6	1 481	2 589	2 148	1 552	1 718	1 754	4 187	3 843	3 702	3 496	3 223	4 360	4 034	3 784	3 535	3 244	2 699	2 323	1 996	1 659

Figure 3: System Firm Energy Demand and Resources (GWh) @ generation

2014/15 Expected Water Flow Conditions

2015/16 Median Water Flow Conditions

2016/17 – 2033/34 Average of All Flow Conditions

	Fiscal Year		2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
	Manitoba Hydro Power Resources											
	Hydro Generation		35 116	34 418	31 084	31 129	30 907	31 456	34 535	35 275	35 251	35 253
	Bipole III Reduced Losses						324	324	352	352	352	352
	Thermal Generation		101	121	358	383	385	328	166	156	162	154
	Existing Wind		918	898	907	907	907	907	907	907	907	907
	New NUG Purchase				97	97	97	97	97	97	97	97
	Imports		180	328	1 355	1 441	1 445	1 392	1 861	2 042	2 109	2 119
1	**Total Power Resources**		**36 315**	**35 765**	**33 800**	**33 956**	**34 064**	**34 503**	**37 917**	**38 828**	**38 877**	**38 881**
	Demand											
	2014 Base Load Forecast		25 589	26 130	26 436	27 174	27 662	28 247	28 583	28 937	29 284	29 626
	Construction Power - Hydro				110	110	110	110	83			
	Less: 2014 Base DSM Forecast		- 283	- 487	- 780	-1 056	-1 407	-1 730	-1 988	-2 183	-2 296	-2 405
2	**Net Load**		**25 306**	**25 643**	**25 766**	**26 228**	**26 365**	**26 627**	**26 678**	**26 754**	**26 988**	**27 221**
3	Contracted Exports		4 537	4 051	3 406	3 438	3 232	3 192	4 474	5 343	5 278	5 251
4	**Total Demand**	2+3	**29 843**	**29 694**	**29 172**	**29 667**	**29 598**	**29 819**	**31 153**	**32 097**	**32 266**	**32 472**
	System Surplus	1-4	**6 472**	**6 071**	**4 628**	**4 290**	**4 466**	**4 684**	**6 764**	**6 731**	**6 611**	**6 409**

	Fiscal Year		2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
	Manitoba Hydro Power Resources											
	Hydro Generation		35 138	35 078	35 243	35 141	35 144	35 146	35 224	35 125	35 133	35 157
	Bipole III Reduced Losses		352	352	352	352	352	352	352	352	352	352
	Thermal Generation		162	162	170	134	129	131	118	117	116	119
	Existing Wind		907	907	907	907	907	907	907	907	907	907
	New NUG Purchase		97	97	97	97	97	97	97	97	97	97
	Imports		2 218	2 103	2 123	2 079	2 136	2 202	2 103	2 175	2 094	2 149
1	**Total Power Resources**		**38 873**	**38 699**	**38 891**	**38 709**	**38 765**	**38 835**	**38 800**	**38 772**	**38 698**	**38 780**
	Demand											
	2014 Base Load Forecast		29 970	30 316	30 659	31 006	31 352	31 703	32 061	32 424	32 796	35 157
	Construction Power - Hydro											
	Less: 2014 Base DSM Forecast		-2 487	-2 562	-2 637	-2 717	-2 797	-2 825	-2 851	-2 874	-2 895	-2 912
2	**Net Load**		**27 484**	**27 754**	**28 022**	**28 289**	**28 555**	**28 879**	**29 210**	**29 550**	**29 902**	**32 245**
3	Contracted Exports		5 251	2 969	2 825	2 286	2 167	2 167	2 005	2 005	2 005	2 005
4	**Total Demand**	2+3	**32 735**	**30 723**	**30 847**	**30 575**	**30 722**	**31 046**	**31 215**	**31 555**	**31 907**	**34 250**
	System Surplus	1-4	**6 138**	**7 976**	**8 044**	**8 134**	**8 043**	**7 789**	**7 585**	**7 217**	**6 791**	**4 530**

Figure 4: Summer Peak Demand and Capacity Resources (MW) @ generation (based on MISO surplus capacity calculations)

Notes / Row	Month	Jul-2015	Jul-2016
	Supply		
1	Total Generation Capacity	5474	5474
	Capacity Imports	0	0
2	Total Supply	5474	5474
	Peak Demand		
	2014 Base Load Forecast	3341	3384
	Less: 2014 Base DSM Forecast	71	116
	Less: Curtailable Load, Station Service	166	166
	Plus: 10% Export Losses	110	132
3	Manitoba Net Load	3214	3234
4	Capacity Exports	1073	1292
5	Total Peak Demand (3 + 4)	4287	4526
6	MISO Planning Reserves	228	230
7	**Surplus (2 - 5 - 6)**	**959**	**718**

Notes:

1. MISO capacity surplus based on generation unforced capacity (i.e. net of forced outage rate). Figure includes all MH supplies however, not all MH generation is necessarily offered to capacity market (e.g., Brandon 5 generation excluded)

6. MISO planning reserve (7.1%)

1 INTRODUCTION

The 2014/15 Power Resource Plan is the annual update to the long-term resource development plan to ensure that adequate resources are available to meet the electricity needs of the province of Manitoba. As the Needs For and Alternatives To (NFAT) process provided a comprehensive review resulting in approval of new major infrastructure included in the recommended development plan, the scope this year has been reduced and only provides an update in order to support the annual corporate resource and financial planning cycles. The Power Resource Plan supports the annual Integrated Financial Forecast (IFF) process as well as other long-term planning and corporate initiatives.

1.1 Resource Planning Criteria

Power resource planning is an essential activity in fulfillment of Manitoba Hydro's mission as stated in the Corporate Strategic Plan:

> "To provide for the continuance of a supply of energy to meet the needs of the province and to promote economy and efficiency in the development, generation, transmission, distribution, supply, and end-use of energy."

Resource planning is governed by Manitoba Hydro Policy P195, Generation Planning which includes the following Capacity and Energy Resource Planning criteria:

1. **Capacity Criterion**
   Manitoba Hydro will plan to carry a minimum reserve against breakdown of plant and increase in demand above forecast of 12% of the Manitoba forecast peak demand each year plus the reserve required by any export contract in effect at the time.

2. **Energy Resource Planning**
   The Corporation will plan to have adequate energy resources to supply the firm energy demand in the event that the lowest recorded coincident water supply conditions are repeated. Imports may be considered as dependable energy resources provided they utilize Firm Transmission Service and are sourced from either an Organized Power Market or a bilateral contract. The total quantity of energy considered as dependable energy from imports shall be limited to that which can be imported during the Off Peak Period, and shall not exceed the quantity of export contracts in effect at the time plus 10% of the Manitoba load.

These planning criteria provide the basis for determining when new resources are required to ensure an adequate supply of capacity and energy for Manitoba.

Section:	Tab 4	Page No.:	16-17
Topic:	Capital Expenditure Forecast		
Subtopic:	Sustaining Capital Spending		
Issue:	Reliability Trends		

PREAMBLE TO IR (IF ANY):

QUESTION:

With respect to Figure 4.15, what hydraulic stations contributed to the higher forced outage rates in 2010-2014?

RATIONALE FOR QUESTION:

The information request seeks to better understand the historic reliabilty trends reported. The issues go to the prudence and reasonableness of expenditures.

RESPONSE:

The table below shows the average (non-weighted) Forced Outage Rate for each of the years along with the Forced Outage Rate for each station. Essentially, Jenpeg and Pointe Du Bois are significant contributors each year with other stations falling into third place, depending on the year.

Table: Forced Outage Rate (%) for 2010 to 2014 - NON-WEIGHTED

2010		2011		2012		2013		2014	
Jenpeg	38.6	Poine Du Bois	46.8	Poine Du Bois	49.7	Poine Du Bois	43.2	Poine Du Bois	50.2
Poine Du Bois	30.5	Jenpeg	35.4	Jenpeg	29.3	Jenpeg	42.9	Jenpeg	45.5
Average	**7.7**	Slave Falls	19.4	Great Falls	20.3	Slave Falls	19.0	McArthur	18.2
Great Falls	5.7	**Average**	**12.4**	**Average**	**13.0**	Pine Falls	16.4	**Average**	**14.3**
Slave Falls	3.4	Seven Sisters	4.6	Slave Falls	6.5	**Average**	**13.2**	Pine Falls	13.3
Seven Sisters	2.9	Great Falls	3.3	Kettle	3.4	Great Falls	7.4	Slave Falls	7.3
McArthur	1.4	Pine Falls	2.6	Pine Falls	2.7	Kelsey	3.6	Great Falls	3.4
Pine Falls	1.3	Grand Rapids	0.9	Seven Sisters	0.7	Wuskwatim	3.5	Seven Sisters	1.8
Laurie River 1	0.4	Laurie River 1	0.8	Wuskwatim	0.6	Laurie River 2	2.6	Wuskwatim	0.6
Long Spruce	0.2	Kelsey	0.3	Grand Rapids	0.5	Grand Rapids	1.3	Grand Rapids	0.6
Kelsey	0.1	McArthur	0.3	Kelsey	0.4	McArthur	1.2	Kettle	0.6
Limestone	0.1	Laurie River 2	0.3	Long Spruce	0.3	Long Spruce	1.0	Limestone	0.6
Grand Rapids	0.0	Long Spruce	0.2	Limestone	0.3	Seven Sisters	0.7	Laurie River 2	0.3
Kettle	0.0	Kettle	0.1	Laurie River 1	0.3	Kettle	0.3	Kelsey	0.3
Laurie River 2	0.0	Limestone	0.1	Laurie River 2	0.2	Limestone	0.2	Long Spruce	0.1
Wuskwatim	na	Wuskwatim	na	McArthur	0.1	Laurie River 1	0.1	Laurie River 1	0.0

Load Forecast and Power Smart Plans MFR 3

Re-File NFAT-MH Exhibits #176-1 and #176-2 Domestic & Export Transmission Losses

As part of this Appendix, Manitoba Hydro is re-filing MH Exhibit #176-1 and MH Exhibit #176-2 provided during the Needs For and Alternatives To proceeding.

Manitoba Hydro

NEEDS FOR AND ALTERNATIVES TO (NFAT)

Manitoba Hydro's Response to PUB Question #1

Ref.: PUB/MH II-402, 2005/06 Winter & Summer

1. **Please confirm that this is MH's most recent filing of the top 50 winter and top 50 summer peak hours of generation.**

2. **Provide the average domestic (common bus) and export transmission losses for the 50 top winter and for the 50 top summer loads.**

Ref.: PUB/MH II-402, 2005/06 Winter & Summer
Attached Tables (PUB/MH II-402, pp. 2 & 3 of 3 (amended to include incremental loss calculations))

3. **Verify or re-calculate the incremental shares (load-squared basis) of the transmission losses going to domestic/common bus firstly and then the exports secondly.**

Transmission Losses Incremental Winter Averages		
Domestic	**Export**	**Overall**
5.2%	**12.55%**	**8.09%**
Incrementally Summer Averages		
5.8%	**15.7%**	**9.59%**

4. **Provide a monthly tabulation of MH's peak (5x16) and off-peak during both winter and summer energy loads, and HVDC & AC transmission losses for 2005/06 and 2012/13.**

Response:

1. Manitoba Hydro filed the top 50 winter and top 50 summer peak hours of generation for the years 2005/06, 2008/09 and 2010/11 in PUB/MH I-041a. The 2005/06 table was refiled in PUB/MH II-402 to include the total system loss calculation for each hour. Therefore, it is confirmed that PUB/MH II-402 is the most recent filing of the top 50 hours of generation for 2005/06.

2. Due to limited time available, statistics for the top 50 summer and winter average domestic (common bus) loads could not be compiled. Manitoba Hydro does not

consider the requested information germane to the analysis of the Preferred Development Plan.

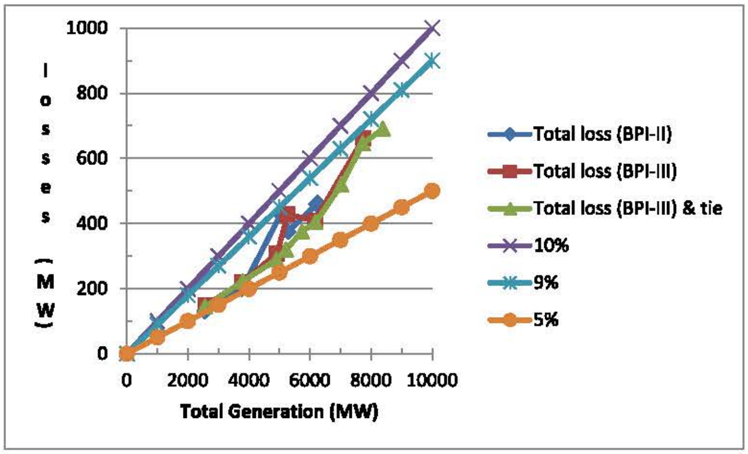
3. The accurate calculation and tracking of system losses and allocation to various load classes including exports is a complex engineering calculation. For this reason Manitoba Hydro has adopted a method for accounting purposes which determines total losses required to supply total load and assigns the same hourly loss/gain ratio to all load classes (residential, commercial, industrial, exports and imports).

With the exception of load flow studies based on actual hourly system data, Manitoba Hydro does not endorse other incremental loss accounting methodologies including the one requested in this Undertaking. These other methodologies have no technical justification for being more accurate or appropriate than the Manitoba Hydro average loss accounting method as they ignore:

a) That exports and imports can be scheduled simultaneously at any time during the day,
b) That all Manitoba Hydro generators can be the source of exports or can be reduced by imports,
c) That the marginal MW of load being served by Manitoba generation is not always an export MW,
d) That Manitoba Hydro is not the only entity using its transmission system to export or import from Manitoba as access to Manitoba Hydro's transmission system is available to all as provided under the MH Transmission Tariff,
e) That loop flows from the US increase losses in Manitoba and are beyond Manitoba Hydro's control. Loop flows are routine and aren't the result of Manitoba Hydro exports activities. However Manitoba Hydro, as a Balancing Authority, must supply this loop flow. In the winter case studied below, average loop flow was 136 MW or about 9% of total exports and for the summer case it was 126 MW or about 6% of total exports.
f) That a portion of the Manitoba load is served on an interruptible basis equivalent to exports.

An example of the potential range of losses calculated using an accurate power system model is given in the figure below. The model data used were from the same twenty-one power flow cases provided to Power Engineers[1] with HVdc station losses[2] also included.

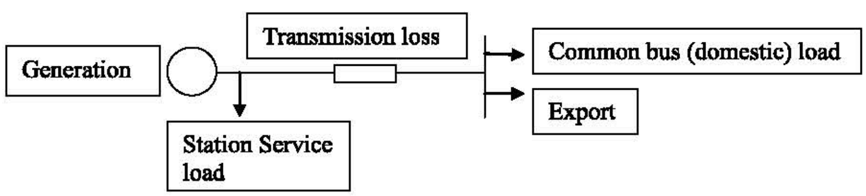
[1] Page 16-19, Power Engineers report to the Public Utilities Board, Jan. 13, 2014.
[2] See PUB/MH II-327b and PUB/MH II-328a



The expected losses ranged between five and nine percent of total generation. In the NFAT analysis Manitoba Hydro has made a conservative assumption of 10%. This value is reasonable for both the existing system and the future system including Bipole III and the new 500 kV tie to the U.S.

However as requested in the Undertaking Manitoba Hydro has calculated incremental losses below using the alternative methodology requested although as explained above it is no more accurate than the Manitoba Hydro practice.

A simple representation of losses in Manitoba can be shown by the following diagram.



Assuming transmission loss is represented by an equivalent resistance (R), then $I_{cb}^2R=Loss_{cb}$. Transmission losses associated with supplying the common bus load is ($Loss_{cb}$). Similar formulas can be derived for transmission losses associated with exports ($Loss_{export}$) and total losses ($Loss_{total}$).

$$I_{cb}^2R=Loss_{cb}$$
$$(I_{cb} + I_{export})^2R=Loss_{total}$$

Substitute $I_{cb} = Load_{cb}/V$ and $I_{export} = Load_{export}/V$ into the above.

$$Loss_{cb}=Loss_{total} * (Load_{cb}^2/(Load_{cb}+Load_{export})^2$$

The above formula assumes common bus (domestic) load is supplied first and exports are supplied next. As mentioned above, this is a hypothetical situation as exports and imports can be scheduled at any time during the day. The results of applying this loss formula are shown in the table below.

Case	A: Load at common bus (MW)	B: MB Exports (MW)	C: Total loss (MW)	D: $A^2/(A+B)^2$ *C Incremental Load losses (MW)	Domestic losses (percent of load at common bus)	E: C-D Incremental Export losses (MW)	Export losses (percent of MB exports)	Total losses (percent of generation)
05/06 Winter	3073	1557	397.6	175	5.70%	222	14.3%	8.1%
05/06 Summer	2365	2091	467.2	132	5.56%	335	16.0%	9.6%

4. Due to limited time available, monthly tabulation of the requested loads and losses could not be compiled. Please refer to PUB/MH II-464b for typical summer and winter peak losses that were analyzed for each of the last 3 years. Total losses, including a breakdown between HVDC and AC losses are given. PUB/MH II-330c can be referred to for an analysis of the losses that occur during various periods including:

- 5×16 summer (peak)
- 5×8 summer (night-time)
- 2×16 summer (weekends)
- 5×16 winter (peak)
- 5×8 winter (night-time)
- 2×16 winter(weekends)

NEEDS FOR AND ALTERNATIVES TO (NFAT)

Manitoba Hydro's Response to PUB Question #1

Ref.: PUB/MH II-402, 2005/06 Winter & Summer

1. Please confirm that this is MH's most recent filing of the top 50 winter and top 50 summer peak hours of generation.

2. Provide the average domestic (common bus) and export transmission losses for the 50 top winter and for the 50 top summer loads.

Ref.: PUB/MH II-402, 2005/06 Winter & Summer Attached Tables (PUB/MH II-402, pp. 2 & 3 of 3 (amended to include incremental loss calculations))

3. Verify or re-calculate the incremental shares (load-squared basis) of the transmission losses going to domestic/common bus firstly and then the exports secondly.

Transmission Losses Incremental Winter Averages		
Domestic	**Export**	**Overall**
5.2%	**12.55%**	**8.09%**
Incrementally Summer Averages		
5.8%	**15.7%**	**9.59%**

4. Provide a monthly tabulation of MH's peak (5x16) and off-peak during both winter and summer energy loads, and HVDC & AC transmission losses for 2005/06 and 2012/13.

Response:

1. Manitoba Hydro filed the top 50 winter and top 50 summer peak hours of generation for the years 2005/06, 2008/09 and 2010/11 in PUB/MH I-041a. The 2005/06 table was refiled in PUB/MH II-402 to include the total system loss calculation for each hour. Therefore, it is confirmed that PUB/MH II-402 is the most recent filing of the top 50 hours of generation for 2005/06.

2. Due to limited time available, statistics for the top 50 summer and winter average domestic (common bus) loads could not be compiled. Manitoba Hydro does not

consider the requested information germane to the analysis of the Preferred Development Plan.

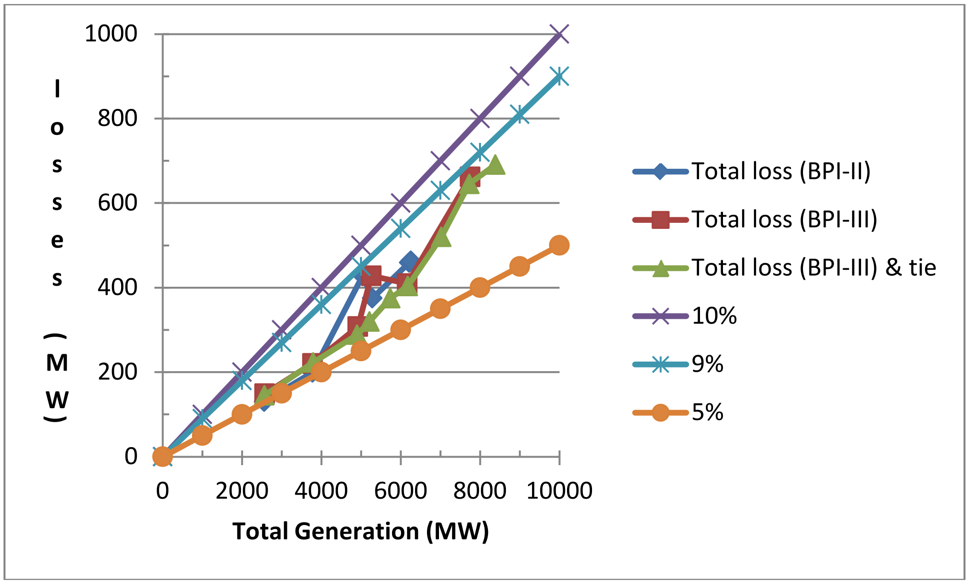
3. The accurate calculation and tracking of system losses and allocation to various load classes including exports is a complex engineering calculation. For this reason Manitoba Hydro has adopted a method for accounting purposes which determines total losses required to supply total load and assigns the same hourly loss/gain ratio to all load classes (residential, commercial, industrial, exports and imports).

   With the exception of load flow studies based on actual hourly system data, Manitoba Hydro does not endorse other incremental loss accounting methodologies including the one requested in this Undertaking. These other methodologies have no technical justification for being more accurate or appropriate than the Manitoba Hydro average loss accounting method as they ignore:

   a) That exports and imports can be scheduled simultaneously at any time during the day,
   b) That all Manitoba Hydro generators can be the source of exports or can be reduced by imports,
   c) That the marginal MW of load being served by Manitoba generation is not always an export MW,
   d) That Manitoba Hydro is not the only entity using its transmission system to export or import from Manitoba as access to Manitoba Hydro's transmission system is available to all as provided under the MH Transmission Tariff,
   e) That loop flows from the US increase losses in Manitoba and are beyond Manitoba Hydro's control. Loop flows are routine and aren't the result of Manitoba Hydro exports activities. However Manitoba Hydro, as a Balancing Authority, must supply this loop flow. In the winter case studied below, average loop flow was 136 MW or about 9% of total exports and for the summer case it was 126 MW or about 6% of total exports.
   f) That a portion of the Manitoba load is served on an interruptible basis equivalent to exports.

   An example of the potential range of losses calculated using an accurate power system model is given in the figure below. The model data used were from the same twenty-one power flow cases provided to Power Engineers[1] with HVdc station losses[2] also included.

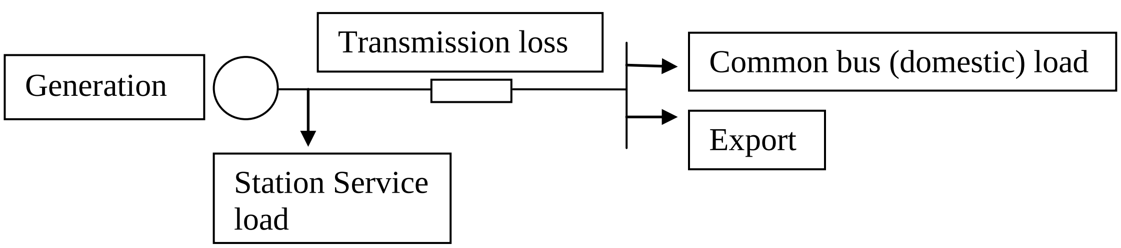
[1] Page 16-19, Power Engineers report to the Public Utilities Board, Jan. 13, 2014.
[2] See PUB/MH II-327b and PUB/MH II-328a



The expected losses ranged between five and nine percent of total generation. In the NFAT analysis Manitoba Hydro has made a conservative assumption of 10%. This value is reasonable for both the existing system and the future system including Bipole III and the new 500 kV tie to the U.S.

However as requested in the Undertaking Manitoba Hydro has calculated incremental losses below using the alternative methodology requested although as explained above it is no more accurate than the Manitoba Hydro practice.

A simple representation of losses in Manitoba can be shown by the following diagram.



Assuming transmission loss is represented by an equivalent resistance (R), then $I_{cb}{}^2R=Loss_{cb}$. Transmission losses associated with supplying the common bus load is ($Loss_{cb}$). Similar formulas can be derived for transmission losses associated with exports ($Loss_{export}$) and total losses ($Loss_{total}$).

$$I_{cb}{}^2R=Loss_{cb}$$
$$(I_{cb} + I_{export})^2R=Loss_{total}$$

Substitute I_{cb} = $Load_{cb}/V$ and I_{export} = $Load_{export}/V$ into the above.

$$Loss_{cb}=Loss_{total} * (Load_{cb}{}^2/(Load_{cb}+Load_{export})^2$$

The above formula assumes common bus (domestic) load is supplied first and exports are supplied next. As mentioned above, this is a hypothetical situation as exports and imports can be scheduled at any time during the day. The results of applying this loss formula are shown in the table below.

Case	A: Load at common bus (MW)	B: MB Exports (MW)	C: Total loss (MW)	D: $A^2/(A+B)^2$ *C Incremental Load losses (MW)	Domestic losses (percent of load at common bus)	E: C-D Incremental Export losses (MW)	Export losses (percent of MB exports)	Total losses (percent of generation)
05/06 Winter	3073	1557	397.6	175	5.70%	222	14.3%	8.1%
05/06 Summer	2365	2091	467.2	132	5.56%	335	16.0%	9.6%

4. Due to limited time available, monthly tabulation of the requested loads and losses could not be compiled. Please refer to PUB/MH II-464b for typical summer and winter peak losses that were analyzed for each of the last 3 years. Total losses, including a breakdown between HVDC and AC losses are given. PUB/MH II-330c can be referred to for an analysis of the losses that occur during various periods including:

- 5×16 summer (peak)
- 5×8 summer (night-time)
- 2×16 summer (weekends)
- 5×16 winter (peak)
- 5×8 winter (night-time)
- 2×16 winter(weekends)

30

2 NEED FOR NEW RESOURCES TO MEET EXISTING OBLIGATIONS

The need for new resources to meet the expected load requirements is assessed using supply assumptions which include the base supply of power resources including committed resources, and the Manitoba base load forecast net of DSM and export sales requirements. Using the planning criteria, the supply demand surplus or deficit is determined for each year for 35 years into the future. The year in which persistent deficits begin for either dependable energy or peak capacity is the year that new resources are required.

Table 1 shows the changes in the dates that new resources were needed for both energy and capacity compared to the 2013 NFAT development plan with level 2 DSM, additional pipeline load and Keeyask G.S. and the new 500kV US interconnection. The variation in the date new resources are needed is due to changes in the load forecast, demand side management (DSM), and base resource assumptions such as the timing of the Pointe du Bois powerhouse rebuild, allowable import quantities, and contract obligations.

For the 2014/15 Power Resource Plan, new resources are required for capacity in 2037/38.

Table 1: Changes to Supply-Demand Balances

Changes to Dependable Energy (GW.h)					
Fiscal Year	2036/37	2037/38	2038/39	2039/40	2040/41
System Surplus (Deficit) 2013, Keeyask, Level 2 DSM, pipeline load	53	(265)	(592)	(927)	(1271)
Decrease in MB Load	1436	1456	1478	1500	1521
Decrease in DSM	(562)	(589)	(616)	(624)	(650)
Pointe du Bois Rebuild - Revised	(150)	(150)	(150)	(3)	87
Decrease in Imports due to decrease in MB Load	(112)	(85)	(83)	(87)	(86)
Other	(106)	(136)	(148)	(128)	(128)
System Surplus (Deficit) 2014, No New Resources	559	232	(111)	(269)	(528)

Changes to Winter Peak Capacity (MWs)					
Fiscal Year	2036/37	2037/38	2038/39	2039/40	2040/41
System Surplus (Deficit) 2013, Keeyask, Level 2 DSM, pipeline load	9	(55)	(119)	(186)	(253)
Decrease in MB Load	268	277	286	296	304
Decrease in DSM	(190)	(203)	(215)	(226)	(238)
Pointe du Bois Rebuild - Revised	(45)	(45)	(45)	42	42
Other	(4)	(4)	(4)	(5)	(5)
System Surplus (Deficit) 2014, No New Resources	38	(30)	(98)	(79)	(149)

31

Development Plan NFAT PDP (14) - BASE SCENARIO - MAINTAIN EXISTING LWR 711-715 OPERATING RANGE
Development Plan Scenario REFERENCE

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
In Millions of Dollars

For the year ended March 31	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
ASSETS										
Plant in Service	15,374	16,436	17,108	18,261	18,821	22,520	22,947	25,701	29,723	30,257
Accumulated Depreciation	(5,173)	(5,536)	(5,856)	(6,223)	(6,612)	(7,028)	(7,482)	(7,938)	(8,450)	(8,997)
Net Plant in Service	10,201	10,900	11,251	12,038	12,209	15,492	15,465	17,762	21,273	21,259
Construction in Progress	2,105	2,866	4,164	5,048	6,617	5,069	6,411	5,209	2,873	4,555
Current and Other Assets	1,869	1,735	1,391	1,579	1,791	2,029	1,845	1,968	2,032	1,696
Goodwill and Intangible Assets	180	165	151	136	126	116	140	147	231	224
Regulated Assets	231	225	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Total Assets	14,587	15,890	16,958	18,802	20,742	22,707	23,861	25,086	26,409	27,735
LIABILITIES AND EQUITY										
Long Term Debt	9,289	11,260	12,802	14,474	16,170	17,742	19,438	20,404	21,727	23,077
Current and Other Liabilities	2,231	1,503	1,659	1,795	2,007	2,381	1,904	2,140	2,092	1,988
Contributions in Aid of Construction	325	334	339	344	348	358	364	371	378	385
Retained Earnings	2,442	2,505	2,299	2,378	2,450	2,490	2,437	2,475	2,538	2,638
Accumulated Other Comprehensive Income	299	287	(142)	(189)	(232)	(264)	(283)	(303)	(326)	(354)
Total Liabilities and Equity	14,587	15,890	16,958	18,802	20,742	22,707	23,861	25,086	26,409	27,735

Development Plan NFAT PDP (14) - BASE SCENARIO - MAINTAIN EXISTING LWR 711-715 OPERATING RANGE
Development Plan Scenario REFERENCE

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
In Millions of Dollars

For the year ended March 31	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ASSETS										
Plant in Service	30,788	31,353	32,042	37,329	42,227	43,649	44,393	44,951	46,932	47,662
Accumulated Depreciation	(9,552)	(10,107)	(10,666)	(11,264)	(11,930)	(12,650)	(13,373)	(14,103)	(14,861)	(15,626)
Net Plant in Service	21,237	21,246	21,376	26,065	30,297	30,999	31,021	30,848	32,072	32,035
Construction in Progress	6,192	7,589	8,716	5,044	1,293	744	1,075	1,515	472	545
Current and Other Assets	1,782	2,083	2,335	2,173	2,461	2,758	3,115	3,351	3,339	4,380
Goodwill and Intangible Assets	218	214	210	207	203	199	196	192	188	185
Regulated Assets	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Total Assets	29,430	31,133	32,637	33,488	34,255	34,700	35,406	35,906	36,071	37,145
LIABILITIES AND EQUITY										
Long Term Debt	25,080	26,482	27,235	28,038	28,239	28,380	28,331	27,634	27,623	27,396
Current and Other Liabilities	1,491	1,523	1,921	1,590	1,690	1,586	1,766	2,219	1,531	1,751
Contributions in Aid of Construction	392	400	407	415	422	430	438	446	455	463
Retained Earnings	2,837	3,097	3,443	3,816	4,273	4,673	5,241	5,975	6,832	7,904
Accumulated Other Comprehensive Income	(370)	(370)	(369)	(369)	(369)	(369)	(369)	(369)	(369)	(369)
Total Liabilities and Equity	29,430	31,133	32,637	33,488	34,255	34,700	35,406	35,906	36,071	37,145

Development Plan	NFAT PDP (14) - 1 FOOT DECREASE IN LWR OPERATING RANGE SCENARIO
Development Plan Scenario	REFERENCE

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
In Millions of Dollars

For the year ended March 31	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
ASSETS										
Plant in Service	15,374	16,436	17,108	18,261	18,821	22,520	22,947	25,701	29,723	30,257
Accumulated Depreciation	(5,173)	(5,536)	(5,856)	(6,223)	(6,612)	(7,028)	(7,482)	(7,938)	(8,450)	(8,997)
Net Plant in Service	10,201	10,900	11,251	12,038	12,209	15,492	15,465	17,762	21,273	21,259
Construction in Progress	2,105	2,866	4,164	5,048	6,617	5,069	6,411	5,209	2,873	4,555
Current and Other Assets	1,869	1,735	1,391	1,579	1,791	2,029	1,846	1,969	2,032	1,696
Goodwill and Intangible Assets	180	165	151	136	126	116	140	147	231	224
Regulated Assets	231	225	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Total Assets	14,587	15,890	16,958	18,802	20,742	22,707	23,861	25,087	26,409	27,735
LIABILITIES AND EQUITY										
Long Term Debt	9,289	11,260	12,802	14,474	16,170	17,742	19,638	20,404	21,727	23,277
Current and Other Liabilities	2,231	1,503	1,670	1,819	2,050	2,447	1,793	2,261	2,238	1,961
Contributions in Aid of Construction	325	334	339	344	348	358	364	371	378	385
Retained Earnings	2,442	2,505	2,288	2,354	2,406	2,424	2,349	2,354	2,392	2,466
Accumulated Other Comprehensive Income	299	287	(142)	(189)	(232)	(264)	(283)	(303)	(326)	(354)
Total Liabilities and Equity	14,587	15,890	16,958	18,802	20,742	22,707	23,861	25,087	26,409	27,735

Development Plan: NFAT PDP (14) - 1 FOOT DECREASE IN LWR OPERATING RANGE SCENARIO
Development Plan Scenario: REFERENCE

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
In Millions of Dollars

For the year ended March 31	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ASSETS										
Plant in Service	30,788	31,353	32,144	37,432	42,330	43,752	44,496	45,054	47,035	47,764
Accumulated Depreciation	(9,552)	(10,107)	(10,666)	(11,268)	(11,937)	(12,660)	(13,386)	(14,120)	(14,881)	(15,650)
Net Plant in Service	21,237	21,246	21,479	26,164	30,393	31,091	31,110	30,933	32,154	32,114
Construction in Progress	6,229	7,678	8,716	5,044	1,293	744	1,075	1,515	472	545
Current and Other Assets	1,784	2,097	2,339	2,185	2,478	2,787	3,081	3,231	3,131	4,282
Goodwill and Intangible Assets	218	214	210	207	203	199	196	192	188	185
Regulated Assets	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Total Assets	29,468	31,235	32,744	33,600	34,367	34,821	35,461	35,871	35,945	37,126
LIABILITIES AND EQUITY										
Long Term Debt	25,280	26,882	27,435	28,438	28,839	28,980	28,931	28,234	28,223	28,196
Current and Other Liabilities	1,540	1,475	2,107	1,628	1,599	1,576	1,774	2,227	1,539	1,763
Contributions in Aid of Construction	392	400	407	415	422	430	438	446	455	463
Retained Earnings	2,625	2,848	3,164	3,489	3,876	4,204	4,688	5,333	6,098	7,073
Accumulated Other Comprehensive Income	(370)	(370)	(369)	(369)	(369)	(369)	(369)	(369)	(369)	(369)
Total Liabilities and Equity	29,468	31,235	32,744	33,600	34,367	34,821	35,461	35,871	35,945	37,126

Development Plan: NFAT PDP (14) - BASE SCENARIO - MAINTAIN EXISTING LWR 711-715 OPERATING RANGE
Development Plan Scenario: REFERENCE

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
In Millions of Dollars

For the year ended March 31	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ASSETS										
Plant in Service	30,788	31,353	32,042	37,329	42,227	43,649	44,393	44,951	46,932	47,662
Accumulated Depreciation	(9,552)	(10,107)	(10,666)	(11,264)	(11,930)	(12,650)	(13,373)	(14,103)	(14,861)	(15,626)
Net Plant in Service	21,237	21,246	21,376	26,065	30,297	30,999	31,021	30,848	32,072	32,035
Construction in Progress	6,192	7,589	8,716	5,044	1,293	744	1,075	1,515	472	545
Current and Other Assets	1,782	2,083	2,335	2,173	2,461	2,758	3,115	3,351	3,339	4,380
Goodwill and Intangible Assets	218	214	210	207	203	199	196	192	188	185
Regulated Assets	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Total Assets	29,430	31,133	32,637	33,488	34,255	34,700	35,406	35,906	36,071	37,145
LIABILITIES AND EQUITY										
Long Term Debt	25,080	26,482	27,235	28,038	28,239	28,380	28,331	27,634	27,623	27,396
Current and Other Liabilities	1,491	1,523	1,921	1,590	1,690	1,586	1,766	2,219	1,531	1,751
Contributions in Aid of Construction	392	400	407	415	422	430	438	446	455	463
Retained Earnings	2,837	3,097	3,443	3,816	4,273	4,673	5,241	5,975	6,832	7,904
Accumulated Other Comprehensive Income	(370)	(370)	(369)	(369)	(369)	(369)	(369)	(369)	(369)	(369)
Total Liabilities and Equity	29,430	31,133	32,637	33,488	34,255	34,700	35,406	35,906	36,071	37,145

LWR CEC Submission – Appendix 12

Shoreline erosion on Lake Winnipeg is described in Section 4.3 of the main document. In response to the Clean Environment Commission's request, the following provides more information on the Lake Winnipeg Shoreline Erosion Advisory Group, the Lake Winnipeg Stewardship Board, and the Shoreline Erosion Technical Committee.

Lake Winnipeg Shoreline Erosion Advisory Group

In response to ongoing concerns voiced by Lake Winnipeg stakeholders, the province of Manitoba established the *Lake Winnipeg Shoreline Erosion Advisory Group* (LWSEAG) in 1998 to review specific issues related to erosion of Lake Winnipeg's shorelines.

The LWSEAG membership consisted of officials from municipalities along the lake's south basin, First Nations, the Manitoba Métis Federation, Lake Winnipeg property owners and professional engineers with expertise in hydrology and erosion.

The purpose of the LWSEAG was to:

- Gather and disseminate information on erosion processes and practical shoreline protection options;
- Assist the Province in initiating a third party assessment of the accuracy and integrity of Manitoba Hydro's reporting of Lake Winnipeg water level data and methodology;
- Receive and respond to public concerns and questions regarding erosion; and
- Advise the Province and stakeholders on matters regarding erosion.

To fulfil its mandate, the LWSEAG met regularly over a period of about 18 months, toured erosion sites and beaches in the south basin of Lake Winnipeg, held public meetings to identify public concerns, received presentations from Crown corporations and government agencies and commissioned studies on technical matters.

The LWSEAG retained Baird and Associates to review the Lake Winnipeg water level reporting procedures and Pollock and Wright to confirm the benchmarks used to set the water level gauges.

> "As a result of the Baird and Associates and the Pollock and Wright reports, the Advisory Group is satisfied that the Lake Winnipeg wind-eliminated water levels determined and reported by Manitoba Hydro are reasonably accurate." (LWSEAG, 2000)

The LWSEAG retained Linnet to estimate the extent of erosion over time using aerial photography at seven areas around the south basin of Lake Winnipeg: Hnausa, Spruce Sands, Matlock, Winnipeg Lake South Ridge, Halcyon, Lester, and Traverse Bay.

> "The general conclusion is that the lake shoreline is dynamic with active deposition and erosion occurring as part of the normal life cycle of the beach."(Linnet, 2000)

The shoreline regulatory environment was found to be a very complicated issue. A number of questions were forwarded to Manitoba Justice and the law firm Aikins, McAulay, and Thorvaldson by the LWSEAG in developing a response to this question.

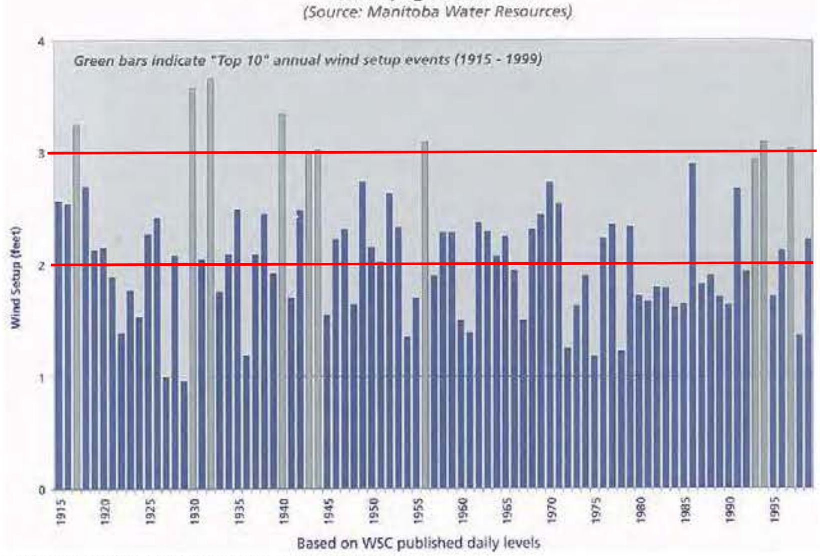
> "Generally, responsibility for the wise management of shoreline seems to lie with a combination of private landowners, municipal governments, and the Province. The role of each will depend on the specific circumstances of the land in question, and will depend largely on how the land was originally granted and on what caveats or conditions may have been placed on the titles over time" (LWSEAG, 2000)

The LWSEAG also retained Baird and Associates and Stantec to review the erosion factors along the shoreline of the south basin of Lake Winnipeg and to identify appropriate shoreline management options for representative sites. The following conclusion from this technical report was reiterated in the LWSEAG's final report:

> "In most instances, erosion, flooding and dynamic beach changes at the shoreline are the result of naturally occurring processes. Man-made alterations to the natural lake systems may affect the extent of erosion, flooding and dynamic beach changes, but typically to a much lesser degree than the natural processes." (LWSEAG, 2000)

One of the main public concerns identified by the LWSEAG was the perception that erosion was occurring at a faster rate, particularly since 1992. In response, the LWSEAG requested information the Water Resources Branch of Manitoba Conservation who indicated that "Three of the ten largest wind set-up events since 1915 occurred between 1993 and 1997." and that "The frequency of occurrence of major wind setup events doubled in the period 1992-1999 as compared to the period 1974-1991." (LWSEAG, 2000) It was also reported that Lake Winnipeg water levels were about 0.4 ft above the long-term average during this period because of above average inflows.

Figure 8.7 - Maximum Annual Wind Setup Events
Winnipeg Beach/Gimli
(Source: Manitoba Water Resources)



Source: LWSEAG Final Report, 2000