Manitoba Hydro

360 Portage Ave (22) • Winnipeg, Manitoba Canada • R3C 0G8
Telephone / N° de téléphone: (204) 360-3946 • Fax / N° de télécopieur: (204) 360-6147 • pjramage@hydro.mb.ca

November 22, 2017

Mr. D. Christle
Secretary and Executive Director
Public Utilities Board
400-330 Portage Avenue
Winnipeg, Manitoba R3C 0C4

Dear Mr. Christle:

RE: MANITOBA HYDRO 2017/18 & 2018/19 GENERAL RATE APPLICATION ("GRA") – REBUTTAL EVIDENCE

Please find attached Manitoba Hydro's Rebuttal Evidence with respect to the written evidence of:

- Philip Raphals of Helios Centre on behalf of the Assembly of Manitoba Chiefs;
- Tyler Markowsky on behalf of the City of Winnipeg;
- Dr. Wayne Simpson and Dr. Janice Compton on behalf of the Consumers' Association of Canada and Winnipeg Harvest ("Coalition");
- Dr. Wayne Simpson on behalf of the Coalition;
- William Harper of Econalysis Consulting Services on behalf of the Coalition;
- METSCO Energy Solutions Inc. on behalf of Coalition;
- Morrison Park Advisors Inc. on behalf of Coalition and Manitoba Industrial Power Users Group ("MIPUG");
- London Economics LLC on behalf of the General Service Small and General Service Medium customer representatives and Keystone Agricultural Producers;
- Patrick Bowman of InterGroup Consultants Ltd. on behalf of MIPUG;
- C.F. Osler of Intergroup Consultants Ltd. and G.D. Forrest of Forkast Municipal and Regulatory Consulting, on behalf of MIPUG; and,
- Paul Chernick of Resource Insight Inc. on behalf of the Green Action Centre.

If you have any questions or comments with respect to this submission, please contact the writer at 204-360-3946 or Odette Fernandes at 204-360-3633.

Yours truly,

MANITOBA HYDRO LEGAL SERVICES DIVISION
Per:

PATRICIA J. RAMAGE
Barrister & Solicitor

cc:

All Registered Interveners
Odette Fernandes, Manitoba Hydro
Bob Peters, Board Counsel
Dayna Steinfeld, PUB Counsel

MANITOBA HYDRO PUBLIC UTILITIES BOARD

IN THE MATTER OF *The Crown Corporation Public Review and Accountability Act*

AND IN THE MATTER OF Manitoba Hydro's 2017/18 & 2018/19 General Rate Application

REBUTTAL EVIDENCE OF MANITOBA HYDRO

WITH RESPECT TO THE WRITTEN EVIDENCE OF:

Patrick Bowman, Intergroup Consultants Ltd. on behalf of the Manitoba Industrial Power Users Group ("MIPUG");

C.F. Osler, Intergroup Consultants Ltd. & G.D. Forrest, Forkast Municipal and Regulatory Consulting, on behalf of MIPUG;

Dr. Wayne Simpson and Dr. Janice Compton, Submitted by the Public Interest Law Centre on behalf of the Consumers' Association of Canada and Winnipeg Harvest ("Coalition");

Dr. Wayne Simpson, Submitted by the Public Interest Law Centre on behalf of the Coalition;

William Harper, Econalysis Consulting Services on behalf of the Coalition;

Morrison Park Advisors Inc. on behalf of the Coalition and MIPUG;

METSCO Energy Solutions Inc. on behalf of the Coalition;

London Economics International LLC on behalf of the General Service Small and General Service Medium customer classes and Keystone Agricultural Producers;

Philip Raphals, Helios Centre on behalf of the Assembly of Manitoba Chiefs;

Tyler Markowsky on behalf of the City of Winnipeg; and,

Paul Chernick, Resource Insight Inc. on behalf of the Green Action Centre

November 22, 2017

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Appendices

1. <u>FINANCIAL FORECAST AND FINANCIAL TARGETS</u>

1.1. Review of Financial Forecasts & Assumptions – Deterioration in the Financial Outlook of Manitoba Hydro

At page 103 of Coalition's evidence, Mr. Harper states that, *"Overall, there is no basis to conclude that the current financial outlook has significantly deteriorated from previous forecasts."* Mr. Bowman at Page 5-1, lines 15-17, asserts *"…scenarios provided by Hydro show sufficient and acceptable financial performances…consistent with general expectations for the utility since at least the NFAT proceeding"*.

In order to meaningfully evaluate the financial performance of the utility as between the two IFFs, adjustments must be made to achieve an "apples to apples" comparison. Both Mr. Harper and Mr. Bowman have failed to make such adjustments and as result their conclusions drawn are deeply flawed.

In **Figure 1.1** below, Manitoba Hydro observes nearly a 300% decline in cumulative net income from 2016/17 to 2026/27 on a like comparison basis using the MH15 (3.95%) rate path[1]. Moreover, Manitoba Hydro observes a 500% decline in forecast net income for 2023/24, the first fiscal year where a consistent comparison is available as the Keeyask Generating Station will have been in service under both MH15 and MH16. Net debt will be 10.5% or $2.4 billion higher notwithstanding lower assumed interest rates and more aggressive cost reduction. Net cost per GWh will be 11% higher in 2023/24 than under MH15. This represents a 65% increase from the forecast 2017/18 Net Unit Cost under MH16. Of note, the 3.95% rate path produces a 30% aggregate rate increase over the same period thus supporting less than 50% of the increase in cost.

There is no basis whatsoever for the assertion by Mr. Bowman or Mr. Harper that there has been no deterioration in the expected financial performance of the business.

[1] Mr. Bowman relies on Manitoba Hydro's MH15 rate scenario in response to PUB/MH I-34 which includes the limitation of assumed lower interest rates corresponding with a 12 year weighted average term to maturity and is not practically feasible with the cash flow generated under a 3.95% rate trajectory. This is discussed in further detail in Section 1.2 and corresponding projected financial statements are provided in **Appendix 1.3**.

Figure 1.1: Comparison of MH16 Update with Interim (at MH15 Rate Increases and 20 Year Weighted Average Term to Maturity) with MH15

	MH16	MH15	Difference	% Difference
2017-2027 Domestic Revenue	$20,865	$22,265	($1,400)	-6.3%
2017-2027 Export & OtherRevenue	$7,193	$8,746	($1,553)	-17.8%
2017-2027 Net Income	($325)	$607	($932)	-153.5%
Adjusted for Current 2017/18 and 2018/19 Outlook*	($78)		($78)	
Adjusted for Keeyask In-Service delayed 21 months**	($750)		($750)	
Proforma 2017-2027 Net Income Comparison	($1,153)	$607	($1,760)	-290.0%
2024 Net Income	($222)	$56	($278)	-496.4%
2024 Net Debt	$24,811	$22,449	$2,362	10.5%
2024 Equity Ratio	12%	12%	-	
2027 Net Income	($160)	$232	($392)	-169.0%
2027 Net Debt	$25,060	$21,838	$3,222	14.8%
2027 Equity Ratio	10%	14%	-4.0%	
2024 Net Cost per GWh***	$0.1000	$0.0900	$0.0100	11.1%
Increase from 2017/18 Net Cost per GWh	65.0%	32.0%	33.0%	
Cumulative Rate Increase after 2017/18	30.0%	30.0%	0.0%	

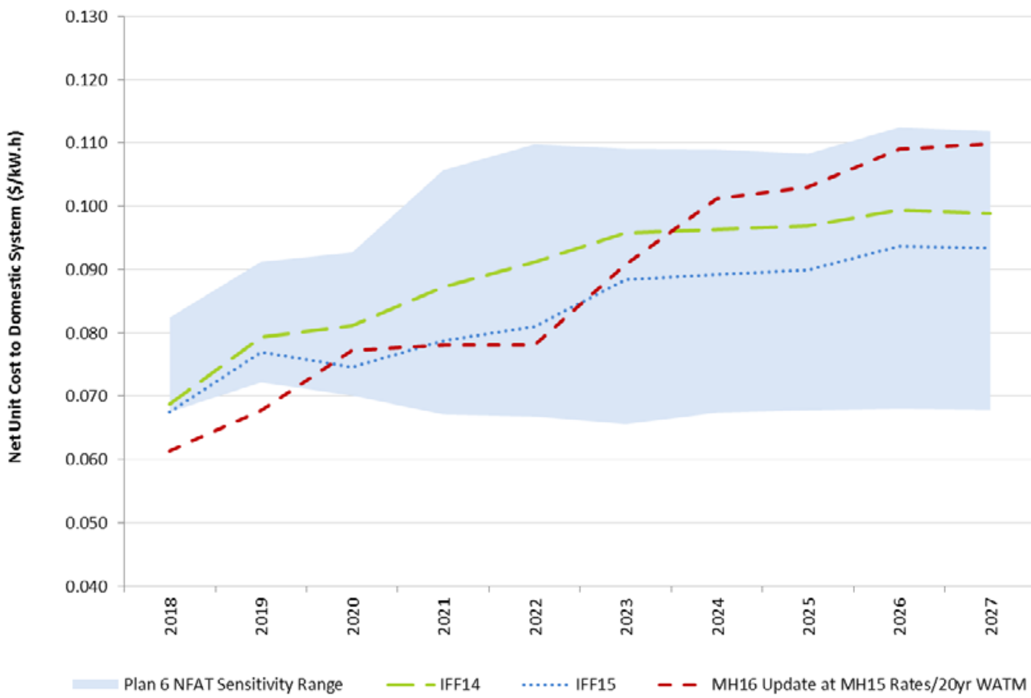
* See current water flow discussion at page 3 below.
** See **Figure 1.3** below. Note that the adjustment also includes the change in annual costs associated with the $2.1 billion higher Keeyask capital cost.
*** See **Figure 1.2** below.

At page 5-3 of MIPUG's Evidence, Mr. Bowman produces Figure 5-1 which presents Manitoba Hydro's net costs on a per unit basis ($/kWh) for a comparable NFAT plan (Plan 5) and IFF's 2014 through MH16 Update with Interim.

In the response to MH/MIPUG-14a, Mr. Bowman confirms that the Domestic Sales figures used in the calculation of net unit costs are based on the 2016 Load Forecast rather than the 2017 Load Forecast which underpins the MH16 Update with Interim net cost figures in the nominator of the calculation. Mr. Bowman reproduces Figure 5-1 in the response to PUB/MH-1 using the 2017 Load Forecast.

In **Figure 1.2** below, Manitoba Hydro has reproduced Figure 5-1 replacing the PUB/MH I-34 scenario at 3.95% rate increases with the MH16 Update with Interim at 3.95% under the 20 Year Weighted Average Term to Maturity ("WATM") assumptions.

Figure 1.2: Net Unit Cost to Domestic Sales* ($/kWh)



* Reproduced using Domestic Sales (Net of DSM) as measured at meter under the same basis that energy and DSM savings are expressed.

Mr. Bowman notes at page 5-3 that the lower net costs in MH16 are partly attributable to the high water flow conditions experienced in 2016/17 and the first quarter of 2017/18. However, Manitoba Hydro advises that the PUB should be cautious in relying on the 2017/18 and 2018/19 forecasts in Mr. Bowman's Figure 5-1. In fact, precipitation has been 85% of normal over the 2nd quarter of 2017/18 since MH16 Update was produced, reducing the forecast hydraulic generation in 2017/18 from 36.0 TWh in MH16 Update to approximately 34.9 TWh, a 1.1 TWh reduction. Manitoba Hydro's 2nd Quarter Financial Report as at September 30, 2017 (PUB MFR 13 Updated) indicates that consolidated net income is now anticipated to be $40 million (approximately $30 million for Electric Operations) due mainly to the reduction in extraprovincial revenues associated with lower hydraulic generation as well as lower forecast near term opportunity prices compared to when MH16 Update was produced. For 2017/18 and 2018/19, Manitoba Hydro now forecasts net export revenues to be $210 million and $198 million, respectively, for a reduction to net income of $78 million over the 2 test years based on current lower water conditions and lower export prices.

Further, Mr. Bowman fails to recognize that relative to previous forecasts, MH16 and MH16 Update incorporate a 21 month delay in the Keeyask project. In comparing Keeyask costs between MH14 (2015/16 & 2016/17 Electric General Rate Application, Appendix 11.15) and MH16 (PUB MFR 20) in **Figure 1.3** below over the period 2017/18 to 2022/23, it can be seen that the years 2019/20, 2020/21 and 2021/22 have substantially lower costs than under MH14 due to Keeyask not being in-service at this time under MH16, thus the net unit cost is lower under MH16 in Figure 5-1 over the period Mr. Bowman characterizes as "below expectations". In short, the comparison fails as it is comparing the net costs under a scenario that includes Keeyask net costs in the 2020-21 timeframe to one that does not. The 11 year comparisons in **Figure 1.3** similarly understate the true erosion of the financial outlook. Manitoba Hydro has approximated this impact (net of export sales) at $750 million.

Figure 1.3: Comparison in Keeyask Costs 2018 to 2024 in MH16 and MH15

2017/18 & 2018/19 Electric General Rate Application
PUB MFR 20
KEEYASK (ISD 2021/22)
(In Millions of Dollars)

For the year ended March 31	2018	2019	2020	2021	2022	2023	2024	Total 2018-2024
Finance Expense	-	-	-	-	114	310	387	811
OM&A Costs	-	-	-	-	9	16	16	40
Depreciation	-	-	-	-	23	107	121	251
Capital Tax	22	28	34	38	42	43	42	248
Water Rentals	-	-	-	-	4	14	15	33
	22	28	34	38	191	489	581	1,383

2015/16 & 2016/17 Electric General Rate Application
Appendix 11.15
KEEYASK (ISD 2019/20)
(In Millions of Dollars)

For the year ended March 31	2018	2019	2020	2021	2022	2023	2024	Total 2018-2024
Finance Expense	-	-	80	271	378	371	366	1,467
OM&A Costs	-	-	5	14	14	14	15	62
Depreciation	-	-	6	65	90	90	90	341
Capital Tax	23	28	31	32	32	31	31	208
Water Rentals	-	-	2	13	15	15	15	59
	23	28	124	395	528	521	517	2,137

Mr. Bowman states at page 5-4 that higher net unit costs under MH16 over the longer term are being driven in part by the ELG method of depreciation which produces higher depreciation relative to the CGAAP ASL method and would narrow the gap in the Manitoba Hydro's net unit cost. Section 1.2 below discusses the implications on rate increases and cash flows under an MH16 Update with Interim at 3.95% rate increases and 20 year WATM applying Mr. Bowman's depreciation and overhead methodologies. To be clear, Manitoba Hydro disputes the appropriateness of Mr. Bowman's preferred methodologies as justification for lower rate increase. Nevertheless, the following **Figure 1.4** calculates the corresponding impact on net unit costs of following Mr. Bowman's preferred methodologies (based on the projected financial statements found in **Appendix 1.1**). By 2024, the gap in net unit cost between MH16 and MH15 is approximately $0.0125/kWh so Mr. Bowman's methodologies only close approximately 30-35% of the gap. Importantly, Mr. Bowman acknowledges at page 6-10 that changes arising from his preferred methodologies are non-cash changes and make no contributions to debt levels.

Figure 1.4: **Net Unit Cost Impact of MIPUG Depreciation and Overhead Methodologies**

$Millions	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**Total 2018-2027**
Reduction to Total Expenses	0	0	0	0	0	0	1	1	2	2	1
Less: Reduction to Regulatory Deferral	0	1	8	11	14	17	98	99	100	100	149
Increase/(Decrease) in Net Cost to Ratepayers	(0)	(1)	(8)	(11)	(14)	(16)	(97)	(98)	(98)	(98)	(148)
Reduction in Net Unit Cost ($/KW.h)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)	

$Millions	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**Total 2018-2036**
Reduction to Total Expenses	3	4	4	5	6	6	7	8	8	58
Less: Reduction to Regulatory Deferral	100	101	101	102	103	103	104	104	105	1,372
Increase/(Decrease) in Net Cost to Ratepayers	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(1,314)
Reduction in Net Unit Cost ($/KW.h)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	

Similarly, Mr. Bowman asserts that a reduction in Manitoba Hydro's investment in DSM will also narrow the gap in net unit costs over the longer term between MH16 and NFAT. The following **Figure 1.5** demonstrates that the impact to net costs to ratepayers even under a 50% reduction to the DSM plan is negligible (**Appendix 1.2**). Further, when the net cost impact is spread over higher Domestic Sales (Net of DSM), the impact to net unit cost is imperceptible.

Figure 1.5: Net Unit Cost Impact of 50% Reduction in DSM ($Millions)

$Millions	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total 2017-2027
Reduction to Total Expenses	0	(47)	(44)	(42)	(45)	(41)	(37)	(39)	(46)	(55)	(394)
Less: Reduction to Regulatory Deferral	0	(50)	(42)	(35)	(29)	(15)	(8)	(6)	(5)	(4)	(195)
Less: Reduction to Export Revenues	(0)	(6)	(11)	(13)	(17)	(26)	(29)	(33)	(42)	(46)	(223)
Increase/(Decrease) in Net Cost to Ratepayers	0	9	10	7	2	(0)	1	1	1	(4)	25
Domestic Sales Net of DSM	22,510	22,224	21,977	21,750	21,971	21,940	21,947	22,103	22,303	22,531	
plus: 50% of DSM savings	173	388	528	656	736	811	880	952	1,021	1,094	
	22,683	22,612	22,506	22,406	22,707	22,751	22,827	23,055	23,324	23,626	
Increase/(Decrease) in Net Unit Cost ($/KW.h)	0.000	0.000	0.000	0.000	0.000	(0.000)	0.000	0.000	0.000	(0.000)	

$Millions	2028	2029	2030	2031	2032	2033	2034	2035	2036	Total 2017-2036
Reduction to Total Expenses	(65)	(69)	(77)	(91)	(99)	(103)	(108)	(108)	(114)	(1,230)
Less: Reduction to Regulatory Deferral	(3)	(1)	(4)	(4)	(5)	(6)	(6)	(6)	(5)	(236)
Less: Reduction to Export Revenues	(53)	(59)	(65)	(70)	(72)	(76)	(82)	(81)	(104)	(883)
Increase/(Decrease) in Net Cost to Ratepayers	(10)	(10)	(9)	(17)	(22)	(21)	(20)	(22)	(5)	(111)
Domestic Sales Net of DSM	22,758	22,976	23,204	23,443	23,819	24,216	24,614	25,024	25,442	
plus: 50% of DSM savings	1,170	1,247	1,323	1,337	1,351	1,364	1,377	1,388	1,400	
	23,928	24,223	24,526	24,780	25,170	25,580	25,990	26,412	26,841	
Increase/(Decrease) in Net Unit Cost ($/KW.h)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	

Forecasting cost reductions based on depreciation and overhead methodologies and/or arbitrary reductions to DSM expenditures are ineffective in the face of net costs that increase nearly 65% from 2018 to 2024 under MH16 compared to a 32% increase over the same period under the NFAT high scenario as shown in **Figure 1.1** above.

In addition to lower water flow conditions, Manitoba anticipates lower domestic load. The following **Figure 1.6** provides an update to Manitoba's annual forecasts of net demand (after DSM savings) since MH16 Update was produced.

Figure 1.6: Domestic Load Net of DSM (GW.h)

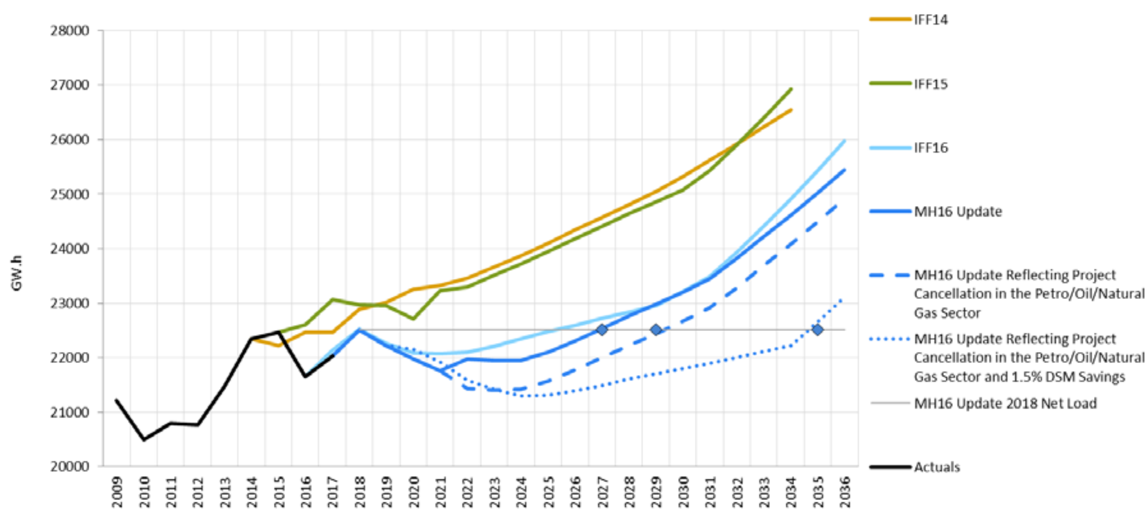


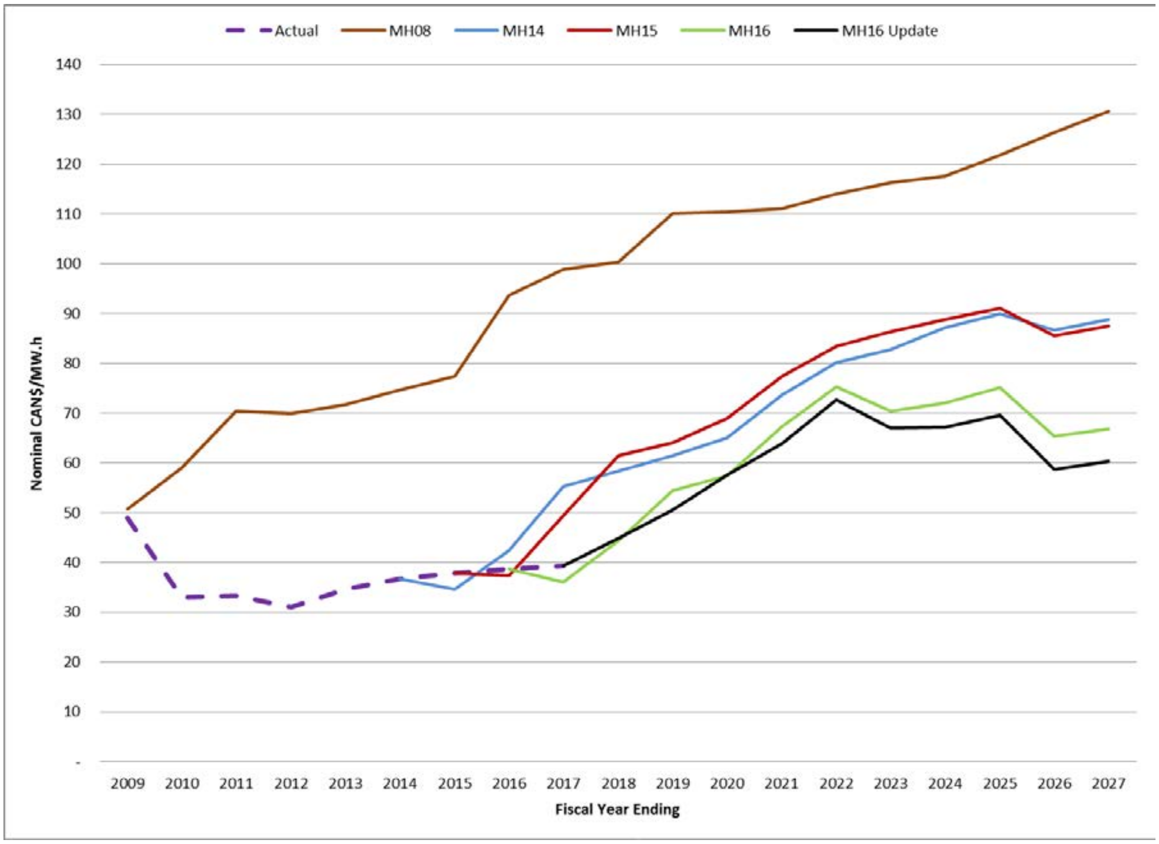
Figure 1.6 above makes clear that successive IFFs have demonstrated a pronounced decline in outlook for domestic load growth. MH16 Update forecast zero net load growth over 10 years. In fact, load is anticipated to decline in the early years of the forecast. Since MH16 Update was prepared, a Petro/Oil/Natural Gas Sector project was cancelled. Manitoba Hydro's MH16 Update includes the assumption of 534 GWh of annual load (at meter) on account of this project beginning in the 2021 timeframe. Excluding this load delays the point where Manitoba Hydro forecasts net load above the 2018 level to 2029 (dashed dark blue) compared to 2027 under MH16 with Update (solid dark blue). When further load reductions potentially anticipated with the 1.5% DSM target of Energy Efficiency Manitoba (PUB/MH I-55b) are layered on (dotted dark blue), the point at which net load recovers to the 2018 level is delayed further until near the end of MH16 Update in 2035. This will have the impact of increasing Manitoba Hydro's net unit cost as a result of spreading increasing net costs to ratepayers over a much smaller revenue base. Meanwhile, the same level of rate increase in percentage terms contributes less incremental revenue due to lower volumes.

Mr. Bowman, Mr. Harper and Osler & Forrest point to equity levels (in dollars) as evidence there has been no deterioration in forecasts. Manitoba Hydro observes that its equity balance is principally determined by its retained earnings which are, in turn, determined by the aggregate net income of the Corporation since its inception. It is important to note several things about equity in general and Manitoba Hydro's equity in particular:

1) Equity is not a cash reserve. There is no store of cash on Manitoba Hydro's balance sheet from which can be drawn to augment shortfalls in income that may be caused by rate insufficiency, low water conditions, rising interest rates or other events.
2) The vast majority (85%) of Manitoba Hydro's equity was produced by income in the years prior to 2011/12. Even since that time, almost all of the growth in Manitoba Hydro's equity is attributable to the income benefit of above average water conditions. From April 1, 2014 to March 31, 2017, Manitoba Hydro's retained earnings increased $201 million. Were it not for export revenues of approximately $215 million attributable to above average water flow conditions, Manitoba Hydro would have seen a $15 million decline in retained earnings from 2015 to 2017.
3) An equity balance of any level, on its own, is of no practical utility to abate rate increases in the event of forecast error or adverse events. In the absence of annual income and cash flow, an equity balance - itself caused by income mainly produced a decade or more ago – provides no source of relief to a new or exacerbated cash flow deficiency.

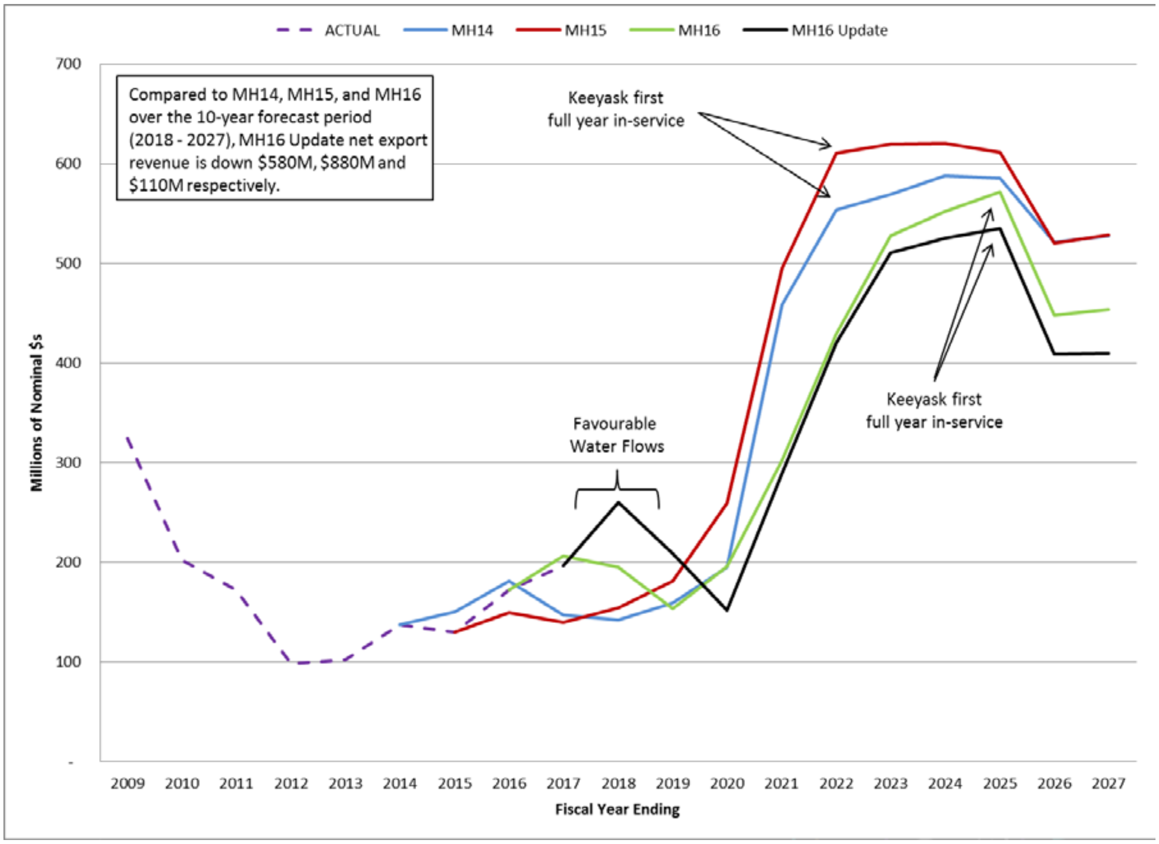
The following **Figure 1.7** shows the average unit revenues from past forecasts of export prices to MH16 Update. Compared to MH08, average unit revenues in MH16 Update have dropped nearly 50% and over 20% compared to MH15.

Figure 1.7: Average Unit Revenues MH08 to MH16 Update (Nominal Cdn $/MW.h)



The following **Figure 1.8** shows the reductions in Extraprovincial Revenues (Net of Water Rentals and Fuel and Power Purchases from MH14 to MH16 Update. Compared to MH14 and MH15 over the 10-year forecast period (2018 - 2027), MH16 Update net export revenue is down $580 million and $880 million, respectively.

Figure 1.8: Extraprovincial Revenues (Net of Water Rentals and Fuel and Power Purchases (Millions of Cdn $)



The ultimate test of whether or not Manitoba Hydro's financial outlook has deteriorated significantly should be Manitoba Hydro's net debt. Mr. Harper relies on the debt ratio as an indicator of financial health stating that the debt ratio, which reaches 88% by 2025 and doesn't show any improvement until 5 years later in 2030, is "in line" with those in previous forecasts at pages 8 and 31 of his Evidence. Note that with the appropriate scenario as shown in **Appendix 1.3**, the MH15 rate path peaks at 90% debt ratio in 2026 and stays at that level until 2030/31. However, nowhere in Mr. Harper's evidence does he examine absolute levels of net debt.

By 2026/27, the debt ratio has deteriorated by 2 percentage points compared to MH15 (4% using **Appendix 1.3**), and in the longer term (2033/34), the debt ratio has deteriorated by 12 percentage points. Mr. Bowman's Figure 5-3 clearly shows that net debt under MH16 Update with Interim exceeds that expected in all previous forecasts under most years. Were it not for the gas turbine assumed in later years of the NFAT scenario, the net debt under MH16 Update with Interim would have been higher than all previous forecasts in all years. On this basis, Manitoba Hydro cannot agree with Mr. Harper or Mr. Bowman that the financial outlook of the corporation has not deteriorated compared to previous forecasts.

In the face of significant declines in export prices and Manitoba load and increased capital costs for Bipole III and Keeyask and their planned in-service in the not too distant future and overall significantly higher levels of debt in relative and absolute terms, there is absolutely no basis for the assertion that rate increases at the same 3.95% level are adequate to absorb the reductions in revenues and increases in costs seen in MH16 and MH16 Update. Manitoba Hydro maintains that its proposed rate increases and rate path are the minimum necessary to recover the deterioration seen in MH16 Update with Interim, as well as put the corporation on a solid financial footing to withstand the significant risks faced by the Corporation.

1.2. Debt Management

On page 5-21 lines 22-28, Mr. Bowman's evidence states:

> *Under a 7.9%/year rate increase scenario, there is so much cash generated in 2021/22 to 2034/35 that $14 billion of debt must be kept at-the-ready to be repaid by surplus cash, with effectively no new long-term debt issued over the period. Even with this strategy, Hydro's exposure to interest rates and debt turnover will be at atypically low levels, well below the target range permitted. If good conditions arise (e.g., good water, export prices), Hydro could be burdened with sufficient surplus cash that no further debt is available to be repaid without incurring a cumbersome and expensive process of retiring long-dated debt that is not otherwise coming due for many years.*

Mr. Bowman's reliance on the period 2028 – 2035 in making his observations regarding available cash to retire debt ignores Manitoba Hydro's evidence with respect to the value of the latter portion of the 20 year forecast, and in particular, its stated intention that it would review and moderate its rate requested depending on the financial circumstances at that time. Mr. Bowman's assertions also ignore Manitoba Hydro's evidence (PUB/MH I-42 and PUB/MH II-21) that it has no intention of achieving the capital structure and rate profile beyond 2026/27 that cause the surplus cash position Mr. Bowman's conclusions rely upon.

Mr. Bowman suggests that a 12 WATM is the appropriate debt management strategy for Manitoba Hydro coupled with a rate profile of 3.95% annual increases for the foreseeable future. The inclusion of the assumption of a 12 Year WATM in Manitoba Hydro's debt management strategy in MH16 Update moves approximately $3 billion of debt maturity from beyond 2027 and into the 2023-27 timeframe. From a risk management standpoint, this change is justified only if there is a reasonable expectation of sufficient cash flow to retire this repositioned debt. The sufficient cash flow stems from the path of higher rate increases assumed in MH16 Update with Interim.

Prior financial plans included an assumption of 20 Year WATM on new issuance principally because such plans – like MH16 Update with Interim at MH15 Rates – generated minimal or even negative net income and cash flow over the next 10 years. Without the expectation of income and cash flow, any new borrowings positioned to mature in the next 10 years are effectively exposed to the risk of higher interest rates when those debts need to be refinanced. It should be noted that Manitoba Hydro is unaware of any instance in prior proceedings where Mr. Bowman challenged the 20 Year WATM strategy as being inappropriate.

Figure 1.9 below compares MH16 Update with Interim with 7.9% rate increases and the 3.95% rate increases with the terming of the 2018-2020 borrowings allocated as per the 12 Year WATM methodology and the 20 Year WATM methodology.

Figure 1.9 MH16 Update with Interim under different rate increase and WATM scenarios

In Billions of Dollars	IFF16U 7.9% 12 Yr WATM	IFF16U 3.95% 12 Yr WATM	IFF16U 3.95% 20 Yr WATM
2018-2022 Borrowing	$ 13.5	$ 14.1	$ 14.0
2023-2027 Borrowing	$ 8.8	$ 9.7	$ 7.0
2023-2027 Cash Surplus Available for Debt Retirement	$ (3.1)	$ (0.4)	$ (0.1)
Total 10 Year Borrowing	$ 19.2	$ 23.4	$ 20.9

With higher rate increases, the MH16 Update with Interim scenario generates more cash flow than under any 3.95% rate path scenario. In the first five years of the forecast (2018-2022), this serves to modestly temper debt growth and borrowing needs as Manitoba Hydro borrows to complete Keeyask, Bipole III, GNTL and MMTP. In the second five years (2023 – 2027), the higher cash flows both limit new borrowing requirements and creates surplus cash that can be used to pay down debt as it comes due instead of needing to refinance. Under the MH16 Update with Interim with 7.9% rate path, Manitoba Hydro will borrow $8.8 billion in the 2023-2027 timeframe, and therefore face refinancing risk on those borrowings. However, the plan assumes $3.1 billion of cash flow that can be used to retire debt in that timeframe, leaving a net exposure of $5.7 billion. Should the $3.1 billion of cash flow not materialize as planned, the refinancing risk would increase. Even with the assumption of the requested rates, a drought during this period could add $1.5 billion to refinancing risk. Rising interest rates, depressed export prices, and/or a decrease in domestic load could impact cash flow, thereby further increasing refinancing risk. Increased capital costs and delays in service of Keeyask could add new debt borrowings into this timeframe further increasing interest rate risk.

Under Mr. Bowman's proposed rate increase and debt management strategy, the Corporation will need to borrow $14.1 billion between 2018 and 2023 followed by an additional $9.7 billion between 2023 and 2027. Prospective cash flow offers almost no relief to the borrowing need in the 2023 to 2027 period.

Placing over $9 billion of refinancing risk into the 2023-2027 timeframe in the absence of any prospective cash flow is, in Manitoba Hydro's informed judgement, too risky. Even without adverse events or forecast error, it would increase the debt exposed to refinancing risk by over 60% ($5.7 billion vs. $9.3 billion) in the period immediately after Keeyask enters service and result in effectively 100% of Manitoba Hydro's debt being exposed to interest rate risk in the next decade. This strategy is inconsistent with past debt strategies with the 3.95% rate path. Both NFAT scenario 5/6 and IFF15 had much lower levels of refinancing risk immediately following the in-service of Keeyask. If Manitoba Hydro has no reasonable prospect of cash flow and de-leveraging, prudence dictates that it must shift its debt strategy toward longer dated maturities in order to protect its ratepayers from unexpected interest rate movements for longer.

Mr. Bowman indicates "...risks today and going forward are materially reduced compared to IFF14 (and much less compared to NFAT) as more of the capital costs and borrowings for the major capital program are locked-in at historically low long-term interest rates"(Page 1-4, Lines 30-33). While Manitoba Hydro acknowledges that approximately half of the borrowing for Keeyask and Bipole III has been completed, Manitoba Hydro still has a significant amount of borrowing to complete in the next decade. As noted, effectively 100% of Manitoba Hydro's forecast debt is exposed to interest rate risk in the next 10 years under Mr. Bowman's proposal. Manitoba Hydro would be forced to refinance a far greater preponderance of shorter term issuance in the 2023-2027 timeframe which is not "de-risking" but "re-risking". Mr. Bowman's arguments in favour of the 12 Year WATM for a 3.95% rate profile run directly counter to his argument that Manitoba Hydro is lowering its interest rate risk with the passage of time. This is "cherry-picking" a potential interest cost savings opportunity in support of lower rates today without any regard to the elevated risk to Manitoba Hydro ratepayers that would result.

Regardless, it should be noted that MH16 Update with Interim showed savings of approximately $500 million due to lowering the WATM of new debt issuance from 20 years to 12 years. However, this was predicated on an interest rate forecast which had an upward sloping yield curve with approximately 160 basis points, or 1.6%, of difference between the all-in borrowing cost for a 5 year Province of Manitoba bond and a 30 year Province of Manitoba bond. Since June 2017, when the Bank of Canada began raising interest rates the yield curve has flattened such that there is now only approximately 90 basis points between the all-in borrowing cost for a 5 year Province of Manitoba bond and a 30 year Province of Manitoba bond. As a result of this change, the savings over the next 10 years under the MH16 Update with Interim erode to under $250 million from adjusting the WATM for new debt issuance from 20 to 12 years **(Appendix 1.4** and **Appendix 1.5**). While the shape of the yield curve and interest rates themselves are subject to further change, the savings opportunity appears to have been substantially compromised lending even less support for Mr. Bowman's proposed debt management strategy.

1.3. Financial Targets, Cash Flow and Rate Sufficiency

1.3.1. Cash Flow Deficiency

MPA implies that Manitoba Hydro is solely focused on the equity ratio and its restoration to the 25% level as its barometer of rate adequacy and that Manitoba Hydro ignores the importance of cash flow metrics. MPA appears to ignore Section 2.2 in Tab 2 and Manitoba Hydro’s Cash Flow from Operation to Capital Expenditures cash flow metric presented in Figure 2.16 in Tab 2. Section 2.2 is entirely dedicated to explaining just how concerned the Corporation is with the level of forecasted cash flow and its inability to meet critical ongoing business requirements at current rate levels.

Figure 1.10 below presents the corporation’s actual cash flow position for fiscal years 2015/16 and 2016/17 and the cash flow outlook underpinning MH16 Update with Interim assuming MH15 rate increases with 20-year debt terming (See **Appendix 1.6**).

Figure 1.10 – Cash Flow (Deficiency)/Surplus

millions of dollars

	Actual		Forecast									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Receipts from Customers	1 907	1 997	2 152	2 170	2 173	2 371	2 577	2 734	2 821	2 931	2 897	3 011
Payments to Suppliers and Employees	(736)	(933)	(892)	(843)	(870)	(885)	(894)	(903)	(935)	(953)	(952)	(966)
Interest Paid (Net of All Capitalized Interest)	(520)	(536)	(528)	(641)	(711)	(789)	(889)	(1 155)	(1 227)	(1 239)	(1 241)	(1 266)
Bipole III and Other Business Operations Capitalized Interest*	(107)	(141)	(197)	(93)	(21)	(18)	(16)	(19)	(19)	(19)	(18)	(20)
Business Operations and Deferred Capital Expenditures:												
Business Operations Capital Expenditures**	(616)	(578)	(586)	(566)	(554)	(544)	(525)	(532)	(544)	(601)	(627)	(646)
Demand Side Management	(54)	(50)	(55)	(97)	(92)	(87)	(85)	(64)	(58)	(60)	(64)	(68)
Mitigation and Other Deferred Expenditures	(22)	(5)	(27)	(26)	(23)	(23)	(22)	(22)	(21)	(22)	(21)	(22)
Ineligible Overhead	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	-	-	-	-
Cash From Operations Less Capex	**(167)**	**(267)**	**(153)**	**(116)**	**(119)**	**5**	**126**	**19**	**16**	**38**	**(26)**	**24**
Mitigation, Major Development & Other Liability Payments	(26)	(13)	(59)	(46)	(36)	(79)	(98)	(88)	(84)	(84)	(71)	(70)
City of Winnipeg Payments	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)
Cash Flow (Deficiency)/Surplus	**(209)**	**(296)**	**(228)**	**(178)**	**(170)**	**(89)**	**12**	**(85)**	**(84)**	**(62)**	**(113)**	**(62)**
Cumulative Cash Flow (Deficiency)/Surplus			**(228)**	**(406)**	**(576)**	**(665)**	**(653)**	**(739)**	**(823)**	**(884)**	**(998)**	**(1 060)**

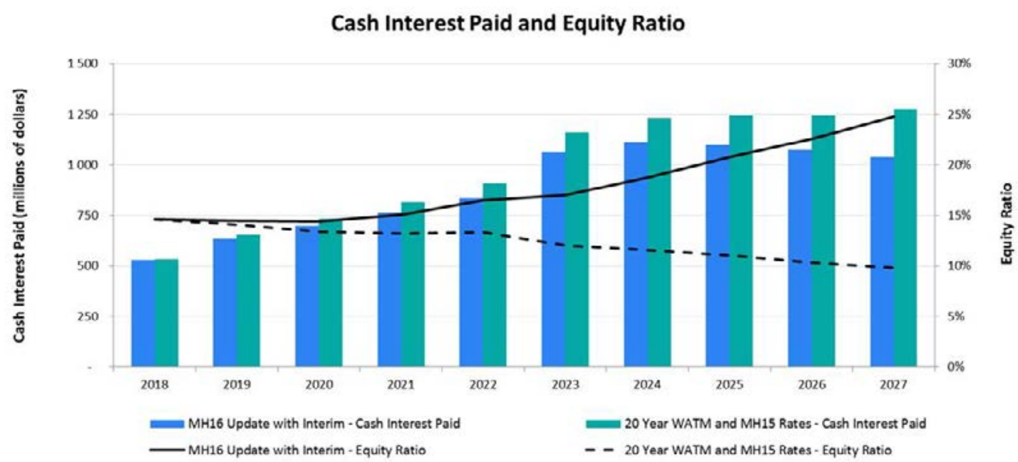
*Bipole III and Other Sustaining Capitalized Interest does not include any capitalized interest associated with Keeyask, MMTP or GNTL.
**Represents Business Operations Capital Expenditures and MNG&T Capital Expenditures of a sustaining nature (excluding Bipole III costs).

In addition to the approximately $700 million of annual recurring cash requirements to maintain normal operations and continue to meet its mandate, **Figure 1.10** includes a number of other non-discretionary cash flows (mitigation, development and other liability payments and the annual payment to the City of Winnipeg) that are included in the financial forecast but were excluded from the CFO to CapEx deficiency/surplus calculation presented in Tab 2 of the Application.

When all of these cash outlays are considered, **Figure 1.10** demonstrates that current rates have not been sufficient, by over 20%, to cover all of the Corporation's normal, ongoing expenditures in 2015/16 and 2016/17 and the 3.95% rate path continues this trend by generating an annual cash flow deficiency in all years but one ($12 million surplus in 2022) and a $1 billion cumulative deficit by 2027.

Interest payments are, and will continue to be, Manitoba Hydro's largest requirement for cash outlays. Therefore, there is a direct connection between cash flow and capital structure which supports the importance of a deliberate and sustained effort to restore the equity ratio (by lowering debt) which in turn reduces the need for cash (and rate revenue) to fund interest costs. As shown in **Figure 1.10**, so long as there are annual cash flow deficiencies, additional debt will be needed to fund the business and cash interest paid will increase. The amount of debt is the most significant driver of cash flow and financial health. **Figure 1.11** below compares the interest paid and the equity ratio between the 7.90% and the 3.95% rate paths.

Figure 1.11 – Comparison of Cash Interest Paid and Equity Ratio



The negative net income and persistent annual cash flow deficiency under the 3.95% rate path contributes to an equity ratio decline of 5% (from 15% down to 10%) over the 10-year forecast period. The 7.90% rate path generates surplus cash beginning in fiscal 2021, the cumulative cash flow deficiency is eliminated by fiscal 2022, the equity ratio begins to improve, and cash interest paid declines beginning in fiscal 2025.

1.3.2. Limitations of Capital Coverage Ratio and EBITDA Interest Coverage Ratio as a measure of cash flow sufficiency

Mr. Bowman argues that one need only focus on Manitoba Hydro's capital coverage ratio as a gauge for financial health and it should be relied upon as the primary cash flow sufficiency test. On page 5-10, Mr. Bowman states:

> "*Further support for the sufficiency of PUB/MH II-34 Attachment 2 is shown with reference to the Hydro's capital coverage ratio. This financial target metric is maintained at or above target (1.2x) for the entire 20 year forecast, and well above the critical 1.0 level. This 1.0 level is a key measure during the early consolidation period following the in-service of a new major plant, indicating the utility is cash positive, can maintain operations and focus on debt management.*"

The capital coverage ratio under the 3.95% rate path with 20-year debt terming is barely above the 1.2 target and, worryingly, shows a declining trend line over the forecast period. Moreover, in spite of a ratio that Mr. Bowman asserts as evidence of being cash flow positive by 20% or more, Manitoba Hydro continues to build debt in the period after Keeyask construction is complete. There is no other conclusion but that the Capital Coverage ratio, as calculated, erroneously suggests Manitoba Hydro is cash flow positive on its core, continuing operations.

Notwithstanding Manitoba Hydro's enumeration of them in its Application and subsequent evidence, Mr. Bowman fails to recognize the two major shortcomings of Manitoba Hydro's capital coverage ratio. Firstly, by ascribing "Major New Generation and Transmission" status to certain projects due to their individual size, the true sustainment capital needs of Manitoba Hydro's operations is understated. This is compounded by the exclusion of other non-discretionary cash payments such as mitigation, development and other liability payments and the annual payment to the City of Winnipeg included in **Figure 1.10** above. Secondly, without making any adjustment for capitalized interest on funds borrowed to finance reliability and sustainment projects like Bipole III, cash flow from operations (numerator in the formula) essentially excludes the interest paid which is an immediate and ongoing cash outlay by the Corporation. MPA elects to rely on the EBITDA interest coverage to determine the reasonableness of the 3.95% rate trajectory from a cash flow perspective. When comparing the results of Manitoba Hydro's uncertainty analysis, MPA makes the following observations:

On page 42,

> *At the P01 position of the EBITDA to Interest plot on the 3.95% rate path, the ratio is never below 1. It should be noted that a ratio of 1 means that operating income is just sufficient to cover finance expense costs. In the parlance of the Moody's and DBRS, as long as Manitoba Hydro is able to continue to cover all of its costs – including operating costs and interest – it will continue to be regarded as "self-supporting", and not a burden to the Province.*

MPA concludes that the 3.95% rate path is both adequate and robust from a cash flow perspective by relying on the modeling results of the EBITDA interest coverage ratio. These conclusions were made despite what MPA had to say about the EBITDA interest coverage ratio on page 9:

> *"This measure alone does not clarify whether the company's debt is increasing, **since there is no information captured in this metric about the size of capital expenditures** (if capital expenditures are greater than 0.8x Net Finance expense, then Manitoba Hydro will have to borrow additional funds, but if capital expenditures are less than 0.8x Net Finance Expense, then the corporation could actually retire some debt principal). By the same token, this ratio provides no information on whether the Debt : Equity Ratio is rising or falling."* (emphasis added)

EBITDA Interest Coverage is often regarded as a solvency metric in that it indicates a company's ability to service its interest costs out of operating earnings (before non-cash depreciation expense). However, as a test of financial durability and cash flow sufficiency, the metric has important shortcomings. It presumes that the cash interest requirements of the business can assert primacy over all the other cash burdens on the company such as capital reinvestment or payment of other contractual liabilities. In actual fact, other than under very short time frames, Manitoba Hydro must fund both its interest costs and its capital and other requirements. If Manitoba Hydro does not have sufficient cash flow after interest payments to fund its ongoing capital and other cash needs then it cannot support its revenue and meet its mandate without borrowing money.

Nonetheless, as shown in **Appendix 1.6**, under the 3.95% rate path with 20-year debt terming, the EBITDA interest coverage ratio minimum target of 1.8 is never met during the 10-year forecast period and generally falls 15% below the minimum threshold.

If, for illustration, Manitoba Hydro were to modify the EBITDA interest coverage ratio to include the fixed charges identified in Figure A above, the results would be as follows in **Figure 1.12** below:

Figure 1.12 – Modified EBITDA Interest Coverage Ratios under 3.95% rate path with 20-year debt terming

millions of dollars

	Forecast									
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Net Income	90	128	33	80	141	(66)	(222)	(176)	(226)	(160)
Net Finance Expense	573	677	753	839	925	1 179	1 251	1 263	1 263	1 283
Capitalized Interest	359	320	318	333	290	55	19	19	18	20
Depreciation and Amortization*	408	482	548	596	643	735	823	840	856	870
Corporate Allocation	8	8	8	8	7	7	7	7	7	7
EBITDA Numerator	**1 439**	**1 614**	**1 661**	**1 856**	**2 006**	**1 911**	**1 880**	**1 953**	**1 918**	**2 019**
Interest	939	1 003	1 078	1 178	1 221	1 241	1 277	1 288	1 287	1 309
Capital and Other Cash Needs	763	772	740	769	766	742	723	783	799	822
Cash Burdens (Denominator)	**1 703**	**1 775**	**1 819**	**1 947**	**1 987**	**1 983**	**2 000**	**2 071**	**2 087**	**2 131**
EBITDA / Ongoing Cash Burdens	**0.85**	**0.91**	**0.91**	**0.95**	**1.01**	**0.96**	**0.94**	**0.94**	**0.92**	**0.95**
Equity Ratio	**15%**	**14%**	**13%**	**13%**	**13%**	**12%**	**12%**	**11%**	**10%**	**10%**

*Including related items in Net Movement.

The results from **Figure 1.12** above demonstrates that also considering the ongoing annual cash charges of Manitoba Hydro reveals the true cash deficiency and the impacts the deficiency has on the capital structure of the corporation and vice versa. The ratios above are an indication of cash flow (and therefore rate revenue) insufficiency that stems from a financial plan (at 3.95% rate increases) that generates a cumulative cash shortfall of almost $1 billion over the next 10 years notwithstanding cumulative rate increases of 46.6%

In the response to MH-MIPUG (BOWMAN)-12, Bowman states the following:

> *On a normal basis, rate setting for a regulated utility should be set with the primary focus being on the income statement and net income sufficiency, not capital coverage which is a cash flow test. Rates should be set looking to costs and revenues as portrayed on an income statement. This is the normal regulatory basis for determining an annual Revenue Requirement. The best metric used by Manitoba Hydro to measure this is the previous EBIT Interest Coverage ratio. Achieving an EBIT Interest Coverage ratio above 1.0 means that debt costs for the year can be*

funded from revenues for the year. The previous EBIT Interest Coverage ratio targeted 1.2 or better, reflecting a cushion above break even.

Manitoba Hydro is not per se endorsing a return to its former EBIT to interest coverage ratio. However, Mr. Bowman's preferred ratio amply demonstrates the inadequacy of the 3.95% rate path. Under the 3.95% rate path with 20-year debt terming, **Figure 1.13** below shows the EBIT interest coverage ratio and net income over the 10-year forecast period. It should be noted that the previous EBIT Interest Coverage ratio target of 1.2 is never met and the ratio remains well below 1.0 in years 2023 to 2027.

Figure 1.13 – EBIT Interest Coverage Ratio and Net Income under 3.95% rate path with 20-year debt terming

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
EBIT Interest Coverage	1.10	1.13	1.03	1.07	1.12	0.95	0.83	0.86	0.82	0.88
Net Income	90	128	33	80	141	(66)	(222)	(176)	(226)	(160)

The overall debt level is inextricably linked to the cash flow of the corporation. Interest expense will be, by far, the largest cash flow burden on Manitoba Hydro's revenues. The pursuit of a 25% equity ratio target within a 10-year planning horizon triangulates with and reinforces generating the net income and cash flow sufficiency that lead to creation necessary reserves or a "cushion" against unforeseen events, contribute to overall debt reduction and support more stable and ultimately lower rates in the long-run than if the 3.95% rate path is pursued.

1.4. Capital Markets Observations

1.4.1. Self-Supporting Status

On pages 4-4 and 4-5 of Mr. Bowman's evidence he states "...they [the credit rating agencies] had reviewed the fact that Hydro planned 20 years to re-attain a 75:25 debt ratio, and that the rating agencies as well as the actual lenders viewed the capital plans (including the financing plans) very favorably particularly given the investment in assets that improved the system capabilities."

Rating agencies have not indicated that they viewed the 20 year plan very favourably. They have indicated that they will continue to monitor the progress on the capital projects, Manitoba Hydro's financial metrics and the financial outlook. Credit rating agencies monitor a variety of financial metrics as evidenced in this quote from DBRS in its credit rating report on the MHEB from November 26, 2015 (Page 2):

> *The Utility has forecast leverage (81.0% as at March 31, 2015) to increase to around 88% during this period of high capex. Additionally, due to the significant lag before electricity rates fully reflect the cost of the ongoing major projects, Manitoba Hydro has forecast weaker earnings, including two years of negative net income, and significant free cash flow deficits for the medium term in its 2015 Integrated Financial Forecast. This will result in further pressure on the Utility's key financial metrics, which could be exacerbated in the event of an adverse circumstance (i.e., severe drought).*

Manitoba Hydro agrees with MPA's evidence that all ratios should be examined together to get an appropriate appreciation of a utility's financial position. Manitoba Hydro has looked to MPA's evidence of Manitoba Hydro's cost recovery peer group to get a better appreciation of its comparative financial position.

1.4.2. The Manitoba Hydro Peer Group

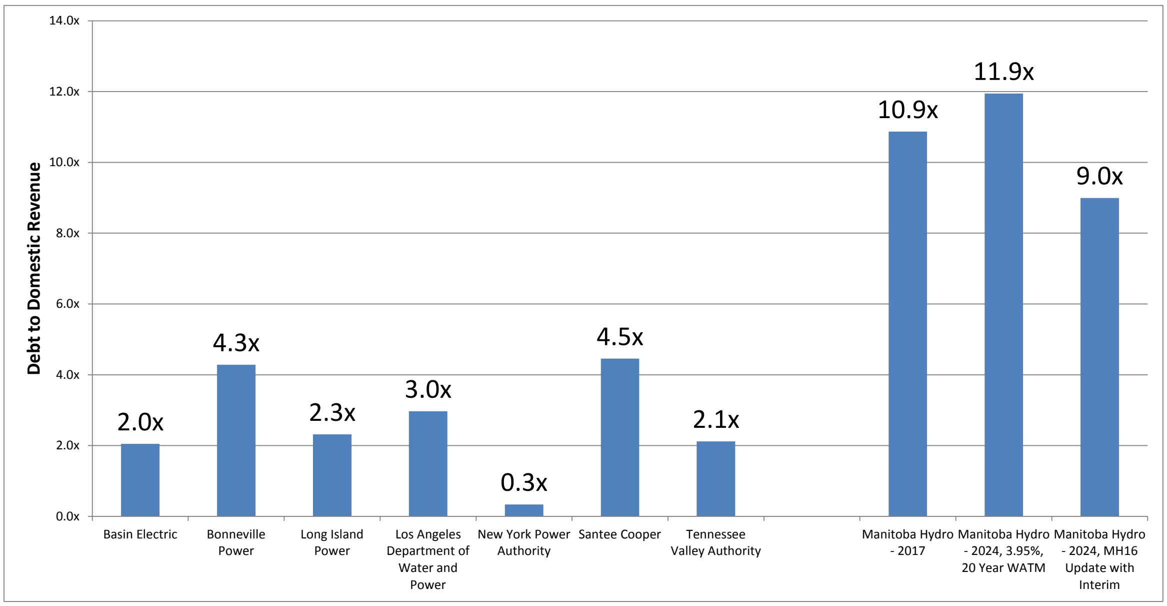
On page 23 lines 8-10, MPA's evidence states "In the United States, by contrast, a number of power authorities are explicitly structured as pure cost recovery enterprises, and pay no dividends to any government or other entity." MPA goes on, at page 34, to point out that several of the U.S.-based "Cost Recovery" peers have debt:equity and debt:PPE ratios at comparable or even higher levels than Manitoba Hydro.

The entities MPA considered as "peers" of Manitoba Hydro are of questionable comparative value. For example, Manitoba Hydro observes that:

a) Bonneville Power Administration (BPA) is a marketer of wholesale power produced, in the main, by dams owned and operated by the U.S. Army Corps of Engineers;
b) BPA's financial results also reflect the operations and maintenance costs of the U.S. Fish and Wildlife Service for the Columbia River Basin. Furthermore, almost 50% of BPA's borrowings are from the U.S. Treasury.

MPA's analysis also fails to consider any scaling of overall debt at these entities in relation to their operations. **Figure 1.14** below summarizes, using the latest year information provided by MPA at pages 87 to 93, the long term debt to revenue for each "cost recovery" peer identified by MPA. This is compared to Manitoba Hydro's long term debt to domestic revenue multiple as at March 31, 2017 and forecast at March 31, 2024.

Figure 1.14 Long Term Debt to Revenue



Debt to Revenue is a means to indicate how much capacity an entity has to afford interest costs and absorb interest rate volatility within its existing rates. At the same assumed interest rate, a lower Debt/Revenue ratio results in interest costs being a smaller proportion of revenue. Conversely, a higher Debt/Revenue ratio means proportionately more revenue dollars are consumed by debt service resulting in reduced financial flexibility.

For Manitoba Hydro, export revenues in the forecast are not impacted by different choices on rate increase profile, interest rate assumptions, or debt terming strategy. Therefore, the entirety of escalation in interest costs is borne by the domestic ratepayer and therefore the correct comparison is to its domestic revenue.

It is worth noting that in spite of potentially similar levels of Debt:Equity or Debt:PPE, Manitoba Hydro has (and will continue to hold under the 3.95% path) a Debt/Revenue ratio that is 3 to 5 TIMES higher than the peers MPA identifies. Notwithstanding similar capital structure ratios, Manitoba Hydro's interest burden, relative to its operations, is significantly higher than the peers MPA has selected. At an assumed 5% interest rate (for illustration), these peers would consume between 2% and 22% of their domestic revenue to meet interest costs. Per **Appendix 1.3**, in 2024 Manitoba Hydro will have $1.251 billion of net finance expense as compared to $2.071 billion of domestic revenue (including other and the non-cash amortization of the Bipole III reserve account). Therefore, Manitoba Hydro will be using over 60% of each dollar of domestic revenue to support interest expense. The suggestion that the capital structure of these entities, particularly given potentially significant structural, regulatory and operational differences, provides any guidepost as to the sustainability of Manitoba Hydro's pending debt load is not supported.

Manitoba Hydro presents two further perspectives on its debt load relative to its operations. By either (or any) measure, Manitoba Hydro's debt has and will continue to increase greatly beyond historical benchmarks for the Corporation. Even following the MH16 Update rate path it does not come close to restoring debt to relative levels consistent with past practice.

Figure 1.15

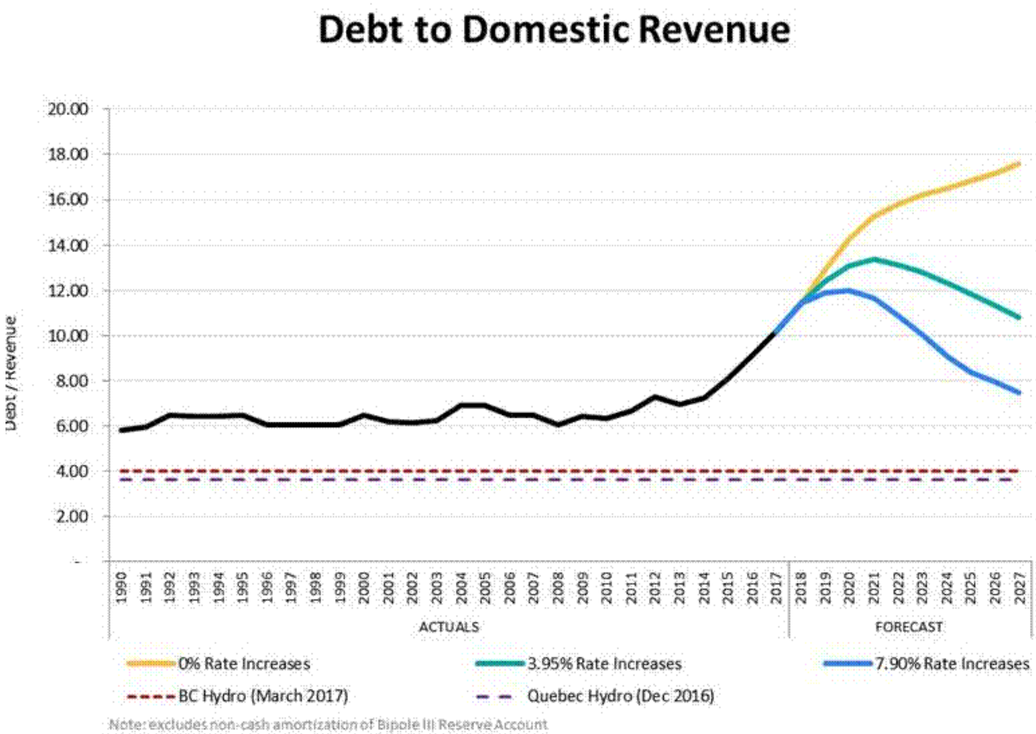
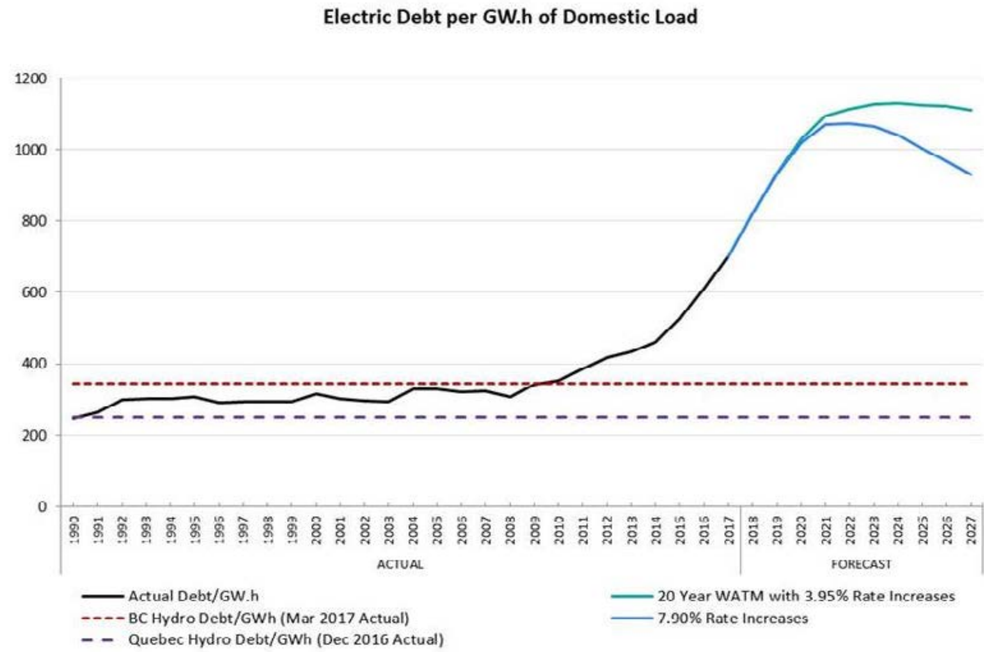

Debt to Domestic Revenue
Debt / Revenue
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
-
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027
ACTUALS
FORECAST
0% Rate Increases
3.95% Rate Increases
7.90% Rate Increases
BC Hydro (March 2017)
Quebec Hydro (Dec 2016)
Note: excludes non-cash amortization of Bipole III Reserve Account

Figure 1.16



1.4.3. Debt Repayment to Protect Provincial Government

On page 4-12 of Mr. Bowman's evidence he characterizes Manitoba Hydro's evidence regarding the benefits of debt reduction including to the Province of Manitoba as being "poorly supported or highly speculative."

In response, Manitoba Hydro notes the following comments of S&P which has downgraded the Province of Manitoba twice in the last two years: "These projected shortfalls will propel further growth in what is already the highest debt burden of any Canadian province. By our estimates, Manitoba's tax-supported debt (including debt on-lent to MHEB) will exceed 300% of operating revenues by fiscal 2020. Our assessment of the province's debt burden fully incorporates the debt on-lent to MHEB, which accounts for more than 40% of total tax-supported debt and for which the province expects to borrow heavily to finance capital projects over the next several years. We do not view MHEB as self-supporting due to its very high and rising leverage." (S&P Province of Manitoba Ratings Direct report dated July 21, 2017filed in PUB MFR 60).

While credit rating agencies differ in how they analyze and rate provinces and assess crown utilities, the pace at which Manitoba Hydro is borrowing and accumulating debt and the outlook for continued borrowing is troubling to all credit rating agencies:

“We note, however, that Manitoba Hydro's total reported debt net of sinking funds has risen considerably, doubling from CAD6.9 billion at March 31, 2008 to an estimated CAD14.2 billion as of March 31, 2016. We expect that its debt will continue to rise over the medium-term as the utility moves forward with construction projects, including the Keeyask hydroelectric station and the Bipole III transmission line, in anticipation of demand increases over the next few years and in order to boost electricity exports. The anticipated increase in debt continues to pressure the province’s rating since it raises the contingent liability of the province.” (Moody’s Credit Opinion, August 3, 2016 filed in PUB MFR 60).

1.4.4. Capital Markets in Practice

On page 27 of MPA’s evidence MPA states “Issuance of provincial bonds or debt notes is typically an auction process”. This is not the case in Manitoba; the Province does not utilize an auction process for long term borrowings. All domestic deals are underwritten by the syndicate with the exception of private one-off deals (for example ultra-long bonds) which are neither frequent nor large in size.

MPA states on page 29 “There is no direct relationship between the opinions of credit rating agencies and the actions of bond purchasers or traders. Bond purchasers participating in the bond market make decisions in real time, and cannot wait for the opinions of external advisors”. While it is true that many institutional investors will do research and analysis in-house, particularly domestic investors, many off-shore accounts still rely on rating reports to assist with investment decisions. In addition, investors have investment policy statements which include minimum credit ratings that bond issuers must maintain in order for investors to purchase their bonds. By S&P downgrading Manitoba to A+ from AA-, some investors can no longer purchase Manitoba bonds. Such investors don’t necessarily have to sell the bonds they are currently holding, but they can no longer participate in Manitoba bond issues. Most, but not all, investment policy statements indicate that where there is a split rating (such as Aa2 and A+ as Manitoba now has), the lowest of the ratings will be the one that dictates investment decisions.

On page 29 MPA indicates "The key issue for a bond buyer is the risk that the debt issuer will not fulfill the terms of the bond: either by failing to make interest payments that are required periodically, or by failing to redeem the bond when it comes due. The greater this risk of default, the higher the interest rate that will be required to entice a bond buyer to purchase a particular bond. At some point, bond buyers will simply refuse to purchase the bonds at any price, if too much risk of default is perceived." Given that Manitoba bonds are investment grade government bonds there is a very low risk of default. In reality, expected performance of the Manitoba credit is more of an issue in determining whether an investor will purchase (or sell) a Manitoba bond and at what price (i.e. interest rate) than is the concern about whether Manitoba will default on the bond. In other words, a bond buyer is far more concerned about the potential for increases or decreases in Manitoba's creditworthiness as this will impact the market value for the Manitoba bonds they hold. All else being equal, deterioration in credit standing would be expected to lead to higher spreads which lower the value of Manitoba bonds which affects the performance of an investor's portfolio. Bond buyers, particularly large institutional ones, would identify this as a "key issue".

1.5. Ratepayer Cost of Capital

1.5.1. Economic Efficiency

At page 47 of its evidence, MPA produces an analysis which compares the present value to customers of two alternate rate paths. The analysis concludes, at page 48, that at a "social discount rate" of above 4.93%, the 3.95% rate path is preferable at least by this measure.

Manitoba Hydro has reproduced at **Appendix 1.7** this analysis, using the scenario of 3.95% rate increases with 20 Year WATM (**Appendix 1.6**) for appropriate comparability. Under this scenario, 3.95% rate increases are required throughout the forecast period in order to restore the 25% equity ratio. On this basis, the "equalizing" discount rate of the two compared rate paths climbs to 6.4%, well above the 5% MPA asserts as the appropriate social discount rate. Below a 6.4% discount rate, the rate path assumed in PUB/MH II-21b produces present value benefits to ratepayers in addition to any advantages to Manitoba economic development that may stem from the prospect of lower, more stable rates sooner.

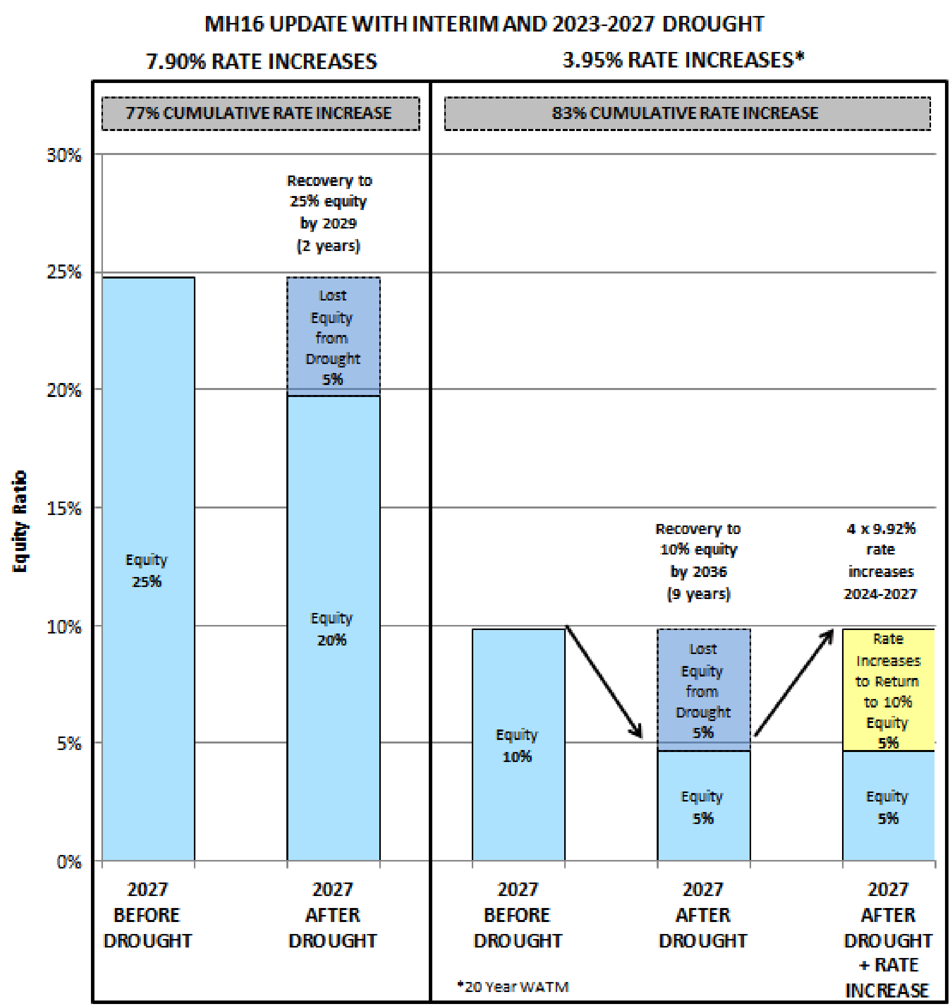
MPA's assertion is that today's ratepayer is largely indifferent, on a present value basis, between a higher rate path to restore Manitoba Hydro's financial health on an accelerated basis as compared to a longer but overall higher march of rate increases to achieve the same outcome. Manitoba Hydro would observe that this analysis presumes that today's ratepayer is already paying the full cost of operating the system, as is its duty. Manitoba Hydro has produced ample evidence that this is not the case. If the early years of rate increases are thought of as restoring rates to meet cost causality while the later years are dedicated to balance sheet restoration, then the picture dramatically changes. Considering the period from 2020 to 2036, the present value to Manitoba Hydro ratepayers of accelerated rate increases is significantly greater than under the 3.95% alternative.

Manitoba Hydro also questions whether the same discount rate should be used to discount two rate paths with a wholly different likelihood of occurring. MPA confirms in its response to MH/Coalition-(MPA)-20(a) that the 3.95% rate path has a higher likelihood of unexpected/unplanned rate action. Using the same discount rate to compare two scenarios with a different risk profile is inconsistent with financial theory.

The 3.95% rate scenario places increased risk on rate payers. Even in the base case, equity falls to a level of 10% and is maintained for years. The PUB has indicated in the past its discomfort with 10% equity levels as noted in Order 43/13, "The Board is concerned with the projected future deterioration of Manitoba Hydro's financial targets, in particular the debt-to-equity ratio that will fall from a current level of 75:25 to 90:10 by 2021, even with projected annual rate increases of approximately 4%, which is twice the projected level of inflation. This deterioration will put Manitoba Hydro in a weaker financial position given its planned capital spending over the next two decades." And "The Board is concerned that, by moving towards a 90:10 debt-to-equity ratio by the end of the decade, there will be an insufficient retained earnings reserve to deal with droughts and other risks such as infrastructure failure or rising interest rates."

Using the five-year drought (beginning in 2023 and ending in 2027) from PUB/MH I-48b, the following analysis (summarized in **Figure 1.17** below) demonstrates the stability and predictability of the 7.90% rate path (**Appendix 1.8**) and the potential risk of rate increases if an unforeseen event should occur under the 3.95% rate path. Under the MH16 Update with Interim rate path, Manitoba Hydro has sufficient cash flow and income to withstand the drought without mitigating rate action. The 25% equity target is not achieved until 2 years later. Under the 3.95% path, in order to restore even a bare minimum 10% equity by 2027, four significant annual rate increases of 9.92% are required (See **Appendix 1.9** and **Appendix 1.10**). Even annual rates after these rates would be an annual reduction of 0.9% which would bring equity levels back to 25% in 2036. On a present value basis, at a 5% discount rate, the Manitoba Hydro plan produces utility bills over the 2018-2036 timeframe that are 22% lower. The "breakeven" discount rate is 9.1%.

Figure 1.17



1.6. Bipole III Incremental Revenue Requirement

In the response to MH/MIPUG-6, Mr. Bowman attempts to calculate the rate increase necessary to recover all Bipole III costs over and above the portion already set aside in current rates by the PUB. **Figure 1.18** below recalculates the incremental Bipole III rate increases for two erroneous assumptions made by Mr. Bowman which understate the rate increase necessary to address the remaining Bipole III revenue requirement shortfall.

Firstly, Mr. Bowman correctly deducts a revenue requirement for the Riel 230/500 kV Station which is already in-service and in the current rate base. However, Mr. Bowman assumes the associated annual costs for this asset are $40 million, whereas PUB MFR 20 includes an annual depreciation amount on these assets of $20 million.

Secondly, Mr. Bowman includes $71 million in amortization of the Bipole III Deferral Account (based on MH16) in calculation of revenue requirement. Manitoba Hydro has updated the amortization to $80 million to reflect the inclusion of the interim 3.36% effective August 1, 2017 to be accrued to the Bipole III Deferral Account in accordance with PUB Order 80/17 in the Restated PUB MFR 20 column. However, Manitoba Hydro asserts that it is inappropriate to include the amortization in the determination of revenue requirement for Bipole III as:

1) it represents revenue that has already been collected from customers in previous periods and the amortization is non-cash in nature; and,
2) the amount, while non-cash, is determined by assuming a 5 year amortization of the reserve balance. It is therefore temporary in nature and not reflective of actual revenue requirement going forward. Manitoba Hydro would still require an additional rate increase to recover costs once the Bipole III Deferral Account has been depleted and fully recognized in Net Income and Retained Earnings.

Manitoba Hydro has accordingly excluded the Bipole III Deferral Account amortization in the Restated PUB MFR 20 column in **Figure 1.18** below.

Figure 1.18: Bipole III Rate Increases to Recover Revenue Requirement

$Millions		**MH/MIPUG-6 2022**	**Restated PUB MFR 20 2022**
Finance Expense		223	223
OM&A Costs		13	13
Depreciation		107	107
Amortization of BPIII Reserve		(71)	(80)
Capital Tax		24	24
		296	287
Add: Amort of Bipole III Deferral		71	80
		367	367
Less: Revenue assoc. with lower line losses		(15)	(15)
Less: Costs assoc. with Riel Stn.		(40)	(20)
Less: Amort of Bipole III Deferral		(71)	-
Annual Bipole III Revenue Requirement		241	332
Bipole III Total Rate Impact	1,595	**15.1%**	**20.8%**
Annual Bipole III Revenue Requirement in Current I	**11.12%**	(177)	(177)
Annual Bipole III Revenue Requirement Shortfall		64	155
Bipole III Revenue Requirement Shortfall to be Recovered in Rates		**4.0%**	**9.7%**

As can be seen in **Figure 1.18** above, Manitoba Hydro calculates the annual Bipole III revenue requirement to be $330 million (compared to Mr. Bowman's $240 million) representing a rate increase of approximately 21%. As there is 11.12% of Bipole III rate increases embedded in current rates, the additional rate increase required to recover the remaining Bipole III revenue requirement is nearly 10% as compared to the 4% set forth by Mr. Bowman in his response to MH/MIPUG-6.

1.7. MPA's Assessment of Manitoba Hydro's Fuel Risk

In commenting on Manitoba Hydro's fuel risk, MPA at page 37 and 38 of its evidence considers the results of the 104 historic water flow cases run on the 2017/18 forecast year using the MH16 underlying forecast that included a 7.90% interim rate increase effective August 1, 2017. MPA makes the following observation: "*Of the 104 water cases, only 18 result in net hydraulic revenues below $160 million, which means in only* *those 18 cases will Manitoba Hydro's net income be negative. Approximately 79% of the time, Manitoba Hydro will have a positive net income."*

There are three notable issues with MPA's assessment of Manitoba Hydro water flow risk in 2017/18:

i. MPA uses a net income for 2017/18 that assumes Manitoba Hydro was awarded a 7.9% rate increase on August 1, 2017. The difference between the interim 7.9% rate increase effective August 1, 2017 and Order 80/17 is an $88M reduction to net income in that year;
ii. Manitoba Hydro had record high reservoir levels at the beginning on fiscal 2017/18, which therefore amplifies the net export revenue in each of the 104 flow cases; and,
iii. MPA implies that anything above $0 net income should be acceptable for Manitoba Hydro.

By adjusting the analysis for Order 80/17 effective August 1, 2017, net income (before net movement in regulatory deferrals) becomes negative in 100% of the flow cases. Put another way, once adjusted for the impact of Order 80/17, there is <u>no</u> flow case in 2017/18 which generates positive net income (before net movement in regulatory deferrals in 2017/18) notwithstanding record reservoir levels boosting export revenues in each case. Further, the analysis of MPA is based on an export price forecast underpinning MH16 which deteriorated 7-10% in MH16 Update.

1.8. DSM Spending levels

Mr. Bowman argues Manitoba Hydro should assume a substantially lower DSM investment and projected energy savings in its Application and determination of future revenue requirements. He states at lines 8-10 that: "it is appropriate to consider the likelihood that Efficiency Manitoba, its Minister, or the PUB will make a finding that continuing large-scale DSM is not cost effective for at least the next 5 – 7 or so years. Hydro should take this likelihood into account in its planning and budgeting."

The Efficiency Manitoba Act received royal assent in June, 2017 and the Province specifically mentions the new Crown Corporation in its 2017 Climate and Green Plan[2], Manitoba Hydro has not, however received any indication from the new entity as to how, and to what extent, its planned activities will differ from those established in

[2] http://www.gov.mb.ca/asset_library/en/climatechange/climategreenplandiscussionpaper.pdf, page 11.

Manitoba Hydro's 2016/17 DSM Plan (Appendix 7.2). Manitoba Hydro notes that the Efficiency Manitoba Act requires cumulative 22.5% energy savings over 15 years; it does not mandate specific year over year savings. To arbitrarily reduce forecasted DSM in the face of a legislative mandate that exceeds Manitoba Hydro's current plan, which outlines 17.3% energy savings over 15 years, is poor planning practice.

Moreover, the reduction of DSM over the next "5 to 7 years", as recommended by Mr. Bowman, offers negligible relief for the deterioration in Manitoba Hydro's forecast. As noted in Section 1.1 above, the impacts of an arbitrary 50% reduction in DSM savings and expenditures will be negligible to the net costs to ratepayers and correspondingly to the net unit cost. The incremental impacts are slow to accrue and not substantially beneficial to Manitoba Hydro's cash flow deficiency in the early forecast years or supportive of reducing the proposed 7.90% rate increase in the test years.

2. <u>OPERATING & ADMINISTRATIVE COSTS</u>

2.1. Manitoba Hydro is Reducing its O&A Costs

Mr. Bowman states in his Evidence at lines 28-29 on page 1-5 that "*With an aggressive cost control program, it is entirely possible that O&A costs below those continued in MH16 may be achieved*." Mr. Bowman provides analysis (Figure 6-2) to support his position that Manitoba Hydro has not achieved a growth in the level of O&A that is at or below inflation since 2011/12. In addition, Mr. Bowman's Evidence on page 1-6, suggests that a further reduction in O&A costs provides an option to implement rates that are within recent ranges (3.36% to 3.95%).

Similarly, London Economics International LLC ("LEI") in its Evidence suggests that Manitoba Hydro could take further steps to reduce its operating costs. As stated on page 43 "*While Manitoba Hydro has announced steps to reduce its operating costs, further evidence is necessary to determine whether these steps are sufficient.*" LEI provides analysis using a number of key performance indicators in order to evaluate the efficiency of the Corporation's operations (Evidence of LEI, pages 44-50). Based on their analysis, LEI recommends that the request for the rate increase be held in abeyance pending an independent review of Manitoba Hydro costs, staffing and operating procedures (Evidence of LEI, page 52).

Manitoba Hydro has implemented effective cost reduction measures including an accelerated cost reduction plan to minimize growth in O&A. As demonstrated in **Figure 2.1** below, Manitoba Hydro's year over year growth since 2014/15 (under IFRS) has been well below Manitoba CPI, and when combined with the Corporation's accelerated cost reduction plan, will result in an overall reduction in O&A costs of approximately $17.5 million in 2017/18 as compared to the 2016/17 fiscal year, with a further reduction of $17.2 million in 2018/19. The average annual decrease in O&A costs over the 5 year period is 1.8% and is primarily the result of staff reductions combined with an overall focus on cost containment including savings achieved through the supply chain initiative. The 5 year average annual decrease in O&A costs of 1.8% compares to a 1.7% average annual increase in Manitoba CPI.

Figure 2.1 Operating & Administrative Expense (IFRS) 2014/15 – 2018/19

	IFRS					
	2014/15 Actual	2015/16 Actual	2016/17 Actual	2017/18 Forecast	2018/19 Forecast	2014-2019 Average Annual % Inc/(Dec)
O&A	538,404	542,729	535,826	518,340	501,183	
O&A % Change		0.8%	(1.3%)	(3.3%)	(3.3%)	(1.8%)
Manitoba CPI		1.3%	1.4%	2.0%	2.1%	1.7%

These savings in O&A expenditures have been achieved primarily through staffing reductions since 2014/15, as outlined in **Figure 2.2** below:

Figure 2.2

Workforce Reduction Plan

	Achieved 2014/15 - 2016/17	**Current Committed Reductions**	**Total Reductions**
President & CEO	4	1	5
General Counsel & Corporate Secretary	2	5	7
Human Resources & Corporate Services	77	147	224
Indigenous Relations	10	9	19
Finance & Strategy	13	33	46
Generation & Wholesale	105	157	262
Transmission	115	198	313
Marketing & Customer Service	103	267	370
Total	429	817	1 246

The O&A figures (referenced in MH-MIPUG (BOWMAN)-18), which are used as the basis for Mr. Bowman's evidence (Figure 6-2, page 6-4), do not take into consideration the impact of significant accounting changes. The changes were implemented over the period 2009/10 to 2013/14 in support of the Corporation's transition to IFRS. As shown in **Figure 2.3** below, Manitoba Hydro recognized approximately $37 million of accounting changes in 2011/12, which increased to $91 million by 2013/14. The majority of the changes were a result of aligning the Corporation's capitalization polices with other Canadian utilities.

Figure 2.3

Summary of Accounting Changes Under CGAAP
(in thousands of dollars)

	2009/10	2010/11	2011/12	2012/13	2013/14
Reduction to Overhead Costs Capitalized	9 100	28 727	29 302	60 180	61 384
Intangbile Assets - Costs Ineligible for Capitalization	4 080	4 162	4 245	4 330	4 416
Pension & Benefits - Discount Rate changes	0	0	3 032	13 835	25 355
Total	13 180	32 889	36 579	78 345	91 155

These changes are not indicative of a change in the costs to operate the Corporation; rather they are a change in the accounting treatment of such costs and should be excluded from any analysis of year over year growth in O&A expenditures.

Excluding the impact of accounting changes, Manitoba Hydro's growth in O&A prior to the transition to IFRS in 2014/15, has been at or below inflation for most years. As outlined in **Figure 2.4** below, the Corporation maintained an average annual growth in O&A over the 5 year period from 2009/10 to 2013/14, under Canadian GAAP (CGAAP) and excluding accounting changes, of 1.9% which was equal to Manitoba CPI.

Figure 2.4 Operating & Administrative Expense (CGAAP) 2009/10 – 2013/14

	CGAAP					
	2009/10 Actual	2010/11 Actual	2011/12 Actual	2012/13 Actual	2013/14 Actual	2009-2014 Average Annual % Inc/(Dec)
O&A, excluding Accounting Changes	364,371	364,057	375,457	384,607	389,562	
O&A % Change (excluding Accounting Changes)	2.7%	(0.1%)	3.1%	2.4%	1.3%	1.9%
Manitoba CPI	1.9%	0.6%	2.8%	1.6%	2.4%	1.9%

2.2. Operating Efficiencies and Service Quality

Mr. Bowman and LEI have both suggested in their evidence that Manitoba Hydro should seek further reductions in O&A expense.

In 2016/17, approximately 3,900 EFTs or 63% of the total workforce were identified as operational in nature and are the largest component of O&A expense. The O&A forecast included a reduction of 18% or 700 operational staff. Further reductions to O&A, as suggested by both Mr. Bowman and LEI, may place undue risk to service levels and reliability and only minimally serve to reduce the overall rate increases requested by Manitoba Hydro.

To analyze the impact on customer rates of further O&A reductions, **Appendix 2.1** incorporates a further reduction of 500 operational staff in 2018/19. This results in operational staffing levels being reduced by approximately 30% since 2016/17 and as such, would have a much higher likelihood of impacting service and reliability levels. The results of this analysis indicate that even with further aggressive operating cost reductions, Manitoba Hydro would still require rate increases of 7.41% per year over the 6 year period from 2018/19 through to 2023/24 as compared to the 7.9% requested in the current GRA. As staff reductions of less than 500 would result in a lower rate differential, the analysis demonstrates that further O&A reductions would have only a minimal impact on Manitoba Hydro's requested rate increases.

Manitoba Hydro is also concerned with the key performance indicators ("KPI") used by LEI (page 45) in their comparison of the Corporation's operational efficiency with other utilities. Each of the KPIs measure the output per employee; however there is no information as to whether the utilities' employee bases are comparable in nature to Manitoba Hydro. For example, Manitoba Hydro's employee count includes staff associated with the procurement and distribution of natural gas as well as approximately 400 staff associated with the construction of major new generation and transmission (Keeyask and Bipole III projects). In addition, some functions performed by Manitoba Hydro employees are currently outsourced by other utilities. For example, BC Hydro contracts with Accenture Business Services BC (ABSBC) to provide services considered outside its primary business of generating and delivering electricity. Reports indicate approximately 500 employees will be returning to BC Hydro following the termination of their contract in April 2018. [3]

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[3] BCUC Order G-20-17 references that on "On March 2, 2017 BC Hydro publically notified its employees that its contract with Accenture Business Services of British Columbia Limited Partnership (Accenture) for certain aspects of its customer services, human resources, finance, office services and temporary work would not be renewed and will therefore terminate on April 30, 2018;…". A news report discussing the contract termination can be found at: https://thetyee.ca/News/2017/04/04/BC-Hydro-Pulls-Plug-on-Outsourcing-Contract/

3. REGULATORY DEFERRAL ACCOUNTS

3.1. Depreciation & Overhead

Mr. Bowman recommends in his Evidence changes to the amortization period for the regulatory deferral accounts for overheads no longer eligible for capitalization and for the ELG/ASL depreciation difference, as follows:

- *Direct a $20 million capitalization of overheads/year indefinitely, amortized over 30 years.*
- *Direct the implementation of depreciation rates consistent with the ASL procedure, with no reversion to ELG procedure in the financial forecast, and no amortization of the difference in rates at any time.*
  (Evidence of Mr. Bowman, lines 10-13, page 1-7)

The recommendations are similar to the conclusions of Mr. Harper in his Evidence where he states:

> *In the case of the Ineligible Overheads account, the amounts should be amortized over at least 30 years and, pending clarification from the Board, the deferral should not be ceased after 2022/23. In the case of the ELG/ASL Differences account, the Board should not endorse any amortization of this account until,… a final decision has been made as to the appropriate depreciation method for regulatory purposes.* (Evidence of Mr. Harper, page 50).

The recommendations to extend the amortization periods of both the ineligible overhead and ELG/ASL differences result in an increase to net income and retained earnings, and, according to Mr. Bowman, provide an option to implement rates that are within recent ranges (3.36% to 3.95%).

While extending the amortization periods for the overhead and depreciation methodology deferrals will result in a reduction to amortization expense and a subsequent increase to net income and retained earnings, such increases are based on a reduction to a non-cash related expense (i.e. amortization expense). As such, increases to net income and retained earnings will not result in a corresponding improvement to the cash flow position of Manitoba Hydro, and would have only a minimal impact on reducing the rate increases of 7.9% requested by Manitoba Hydro in its Application.

Appendix 3.1 incorporates the recommendations of Mr. Bowman as outlined on page 1-7 including: i) continuation of both the overhead and ELG/ASL deferrals through the forecast period; ii) extension to the amortization period of the overhead deferral to 30 years; and iii) no amortization of the ELG/ASL depreciation deferral. The results of this analysis indicate that Manitoba Hydro would require rate increases of 7.64% per year over the 6 year period from 2018/19 through to 2023/24 as compared to the 7.9% requested in the current GRA. This is due to the fact that reductions to debt levels through improved cash flows from the 7.9% rate increases will have a much greater impact on the financial position of the Corporation as opposed to equivalent reductions to non-cash related expenses.

Appendix 3.2 provides projected financial statements (pages 1 to 6) and analyzes the cash flow impacts (page 7) of a 3.95% rate trajectory (per PUB/MH I-34 Attachment 2 which is based on MH16 Update with Interim, including the 3.36% interim rate approved by the PUB for 2017/18, followed by 3.95% rate increases in 2018/19-2028/29, and 2% thereafter), adjusted for Mr. Bowman's recommendations as noted above. As indicated in **Figure 3.1** below, while incorporating the recommendations of Mr. Bowman increases net income, these recommendations also result in a cumulative cash flow deficiency of $577 million through 2027, only a $7 million difference as compared to the results of PUB I-34 Attachment 2 as provided in **Appendix 3.3**.

Figure 3.1 CFO to Capex Impact of Extending the Amortization Period of Deferrals for Overhead and Depreciation

(In millions of dollars)

For the year ended March 31	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PUB/MH I-34 Attachment 2 Adjusted (Appendix 3.2)	(226)	(387)	(528)	(574)	(506)	(532)	(553)	(550)	(596)	(577)
PUB/MH I-34 Attachment 2 (Appendix 3.3)	(226)	(387)	(528)	(573)	(505)	(531)	(552)	(547)	(592)	(570)
Cumulative Difference	**(0)**	**(0)**	**(0)**	**(0)**	**(0)**	**(1)**	**(1)**	**(3)**	**(5)**	**(7)**

Consistent with Manitoba Hydro's responses to MIPUG MFR 5, PUB/MH I-1b and PUB/MH II-2a-c, the analysis demonstrates that 7.9% rate increases are required as a result of growing debt levels and deterioration in cash flows and are not resolved through accounting changes related to the amortization periods of regulatory deferral accounts.

4. ASSET MANAGEMENT, SUSTAINING CAPITAL EXPENDITURES AND MAJOR CAPITAL

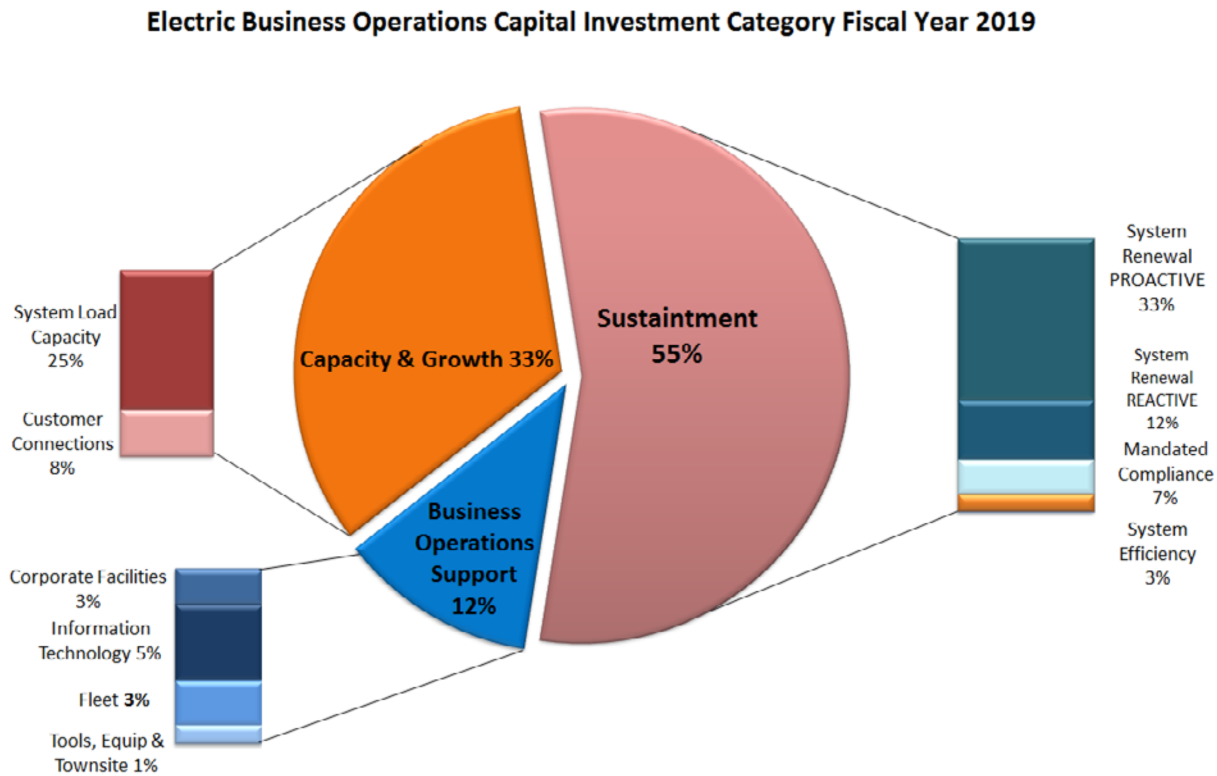
4.1 System Renewal Capital Budget

4.1.1 All Test Year Investments are Condition-Driven and Required for the Safe and Reliable Operation of the System

As indicated on Page v of its Evidence, the METSCO report focuses on Manitoba Hydro's System Renewal investments. Within the test years, Manitoba Hydro's System Renewal investment accounts for only 7.5% ($672M of $8,880M) of the total capital expenditure (CEF16).

Figure 4.1 below shows a typical distribution of Business Operations Capital by investment category, with System Renewal split into Reactive and Proactive. Proactive System Renewal investments account for approximately one third of the total Business Operations Capital investments or $168M for fiscal year 2019. These are investments to proactively mitigate the risk of in-service failure of deteriorated assets that are planned based on risk assessments made in consideration of asset condition and cannot be avoided. While the timing of these investments has limited flexibility up until the asset fails in-service, delaying these investments increases safety and operational risk.

Figure 4.1



The impact of reducing Business Operations Capital spending by $100 million every year does not have a material impact on the rate increases sought in this GRA and more importantly, would risk the safe and reliable operation of the system. All of the proactive interventions in the test years are justified by risk assessments performed by experienced operators and subject matter experts with professional expertise based on asset condition and criticality, with appropriate management oversight and approval.

Examples of the risk assessments performed in each of the operating groups are provided below.

Condition based risk assessments are used to justify and plan streetlight replacements, line refurbishments, wood pole replacements (identified through Integrated Pole Maintenance Inspections), duct line replacements, grounding improvements, and emergency cable replacement projects on the distribution system. These assets are necessary components of the system and are being replaced once deteriorated beyond acceptable limits.

In addition to condition-based replacements, a number of proactive interventions are also utilized on the distribution system to extend the life of distribution assets. These programs include the application of bandage wraps and chemical treatments to prolong wood pole life and the use of silicone injection technology to rehabilitate deteriorated insulation on cross-linked polyethylene (XLPE) underground cables.

An example of a specific project from the transmission system is the 13.2 kV Shunt Reactor Replacements which were approved for execution based on quantitative internal inspections and the results from dissolved gas analysis. These reactors are required to operate within acceptable voltage ranges to avoid excessively high voltages on the transmission system which could damage system and customer equipment. The likelihood of failure was assessed to be high by equipment specialists because the majority of the reactor insulating oil test samples contained acetylene and hydrogen, gases which indicate internal arcing, and because a similar type of reactor had already failed.

A further example from the transmission system is the spacer-damper replacement project for the Bipole I and II HVDC transmission lines. The spacer-dampers act as shock absorbers, protecting the conductors and steel tower members from damaging vibrations caused by wind. Recent condition assessments identified evidence of poor damper performance including loose steel members on the Bipole 1 & 2 towers, loose clamping arms on the spacer-dampers and broken conductor strands. Continued damper deterioration, if left unchecked, would result in a 50% chance of forced outage within the next five years (estimated 2-day outage at a cost of $2M), with accelerating forced outage rates as the condition of the conductors continues to degrade. The risk of outage combined with the increase cost to repair accumulating damage necessitated the replacement of the spacer-dampers.

An example of a dam safety risk on the generating system is the Slave Falls Creek Spillway, a concrete control structure built circa 1930. Freeze-thaw cycles had damaged the concrete to the point that a pier was in danger of failing. The consequences of a pier failure are an uncontrolled release of water and a full plant shutdown at the Slave Falls Generating Station as the failure would sever communication cables necessary for operations that run inside the spillway deck. A project was initiated to arrest freeze-thaw degradation and stabilize the piers at a fraction of the cost of rebuilding the spillway.

Another example is the modernizing of the Limestone Generator Supervisory Control and Data Acquisition (GSCADA) systems installed circa 1992. The systems are obsolete and have suffered multiple server and unit control failures. Availability of spare parts and vendor support are poor and the probability of a critical failure is increasing in time as the reliability and serviceability of the systems decline. These systems are critical to the operation of the Limestone Generating Station (1340 MW), which in turn is critical to Manitoba Hydro system operations.

In summary, all test year investments are fully justified, necessary and required to continue to operate the system in a safe and reliable manner.

4.2 Asset Management Policies, Processes and Capabilities

The METSCO report includes a review of Manitoba Hydro asset management policies, processes and capabilities, primarily reiterating gaps already identified as part of Manitoba Hydro's Corporate Asset Management initiative as included in Manitoba Hydro's evidence.

While the METSCO report recognizes many improvements already underway at Manitoba Hydro, it also includes several erroneous statements and assumptions regarding Manitoba Hydro's practices, which are itemized and addressed below.

From the outset, it should be noted that only one North American utility is currently ISO5500x compliant (Pacific Gas and Electric's Gas Operations as noted in the response to MH/METSCO I-2) and several years of concerted effort are required to achieve industry best practice (MH/METSCO I-1).

METSCO presents several distribution utilities as examples of advanced asset management practices and relies heavily on experience from the Ontario Energy Board's regulation of distribution utilities, but does not provide any examples of vertically integrated utilities in North America operating at this level of maturity.

Manitoba Hydro acknowledges that continuous improvement in its asset management maturity is desirable and has initiated a Corporate Asset Management framework to ensure that consistent practices are implemented across the entire organization.

With respect to Manitoba Hydro's capital expenditures under consideration within this GRA, the tangible outcomes are system renewal projects and programs to be executed in the test years and system renewal budgets beyond the test years.

4.2.1 METSCO's Opinion of Manitoba Hydro System Renewal Budgets Lacks a Factual Underpinning

METSCO opines that Manitoba Hydro System Renewal capital budgets are not adequately supported by evidence:

> *"Based on our observations detailed below, and subject to insights that may emerge through the remaining stages of this proceeding, we conclude that the Applicant's System Renewal capital budgets for the test years and beyond, as presented in Appendix 5.42, are not adequately supported by evidence. (page vi)*

METSCO's conclusion is based upon a number of incorrect or misleading premises as set forth and addressed below.

4.2.2 All Test Year System Renewal Investments are Justified by Risk Analyses

METSCO's assertion that *"On the balance of the above information, it is our interim conclusion that age – not condition – was a predominant factor in determining the work program."* (Page 41) is unfounded.

All proactive replacement of assets in the test years have been justified through asset condition assessments and have undergone risk analysis considering a multitude of factors including age to determine that the replacements were essential to the safe and reliable operation of the system.

Manitoba Hydro does not employ "age alone" as a unilateral trigger for replacement of assets. All of the test year investments are justified on a number of factors with an analysis of the risk to operations. In addition to the projects listed above, another example of condition-based risk assessment is the replacement of the step-up transformers at Slave Falls Generating Station which was not initiated until condition assessments detected early indication of failure despite the transformers being 69 to 89 years old. The most recent condition assessment found the transformers to be in very poor (5 transformers), poor (3 transformers), fair (1 transformer) and good (1 transformer) condition. The consequence of in-service failure of a transformer is estimated at $4M in lost revenue and the probability of failure assessed to be almost certain and therefore the risk to be unacceptable.

Deteriorating asset population health is a concern for Manitoba Hydro and one of the drivers of its Corporate Asset Management initiative. Large numbers of Manitoba Hydro assets are approaching end of life and will need to be addressed in the coming decades. For instance, during rural electrification between 1945 and 1960 over 250,000 wood poles were installed and are now 57 to 72 years old. Manitoba Hydro's wood pole population exceeds one million poles and condition-based replacements are averaging approximately 7000 poles a year. Assuming only that the poles might need to be replaced at a similar pace to which they were installed, pole replacements may need to increase to 16,000 or more a year.

There is a potential risk of coincident bulges in replacement demand creating an unmanageable backlog of replacements for many key distribution assets including wood poles. If unforeseen, such a backlog would overwhelm reactive capacity and significantly impact operations as failed assets would not be replaced in a reasonable time frame. This potential backlog would also create a significant spike in investment levels due to the sharp increase in the volume of replacements, but also the inefficiencies of large numbers of one-off emergency replacements as opposed to planned group replacements.

Manitoba Hydro is developing the asset management tools and processes needed to assess and manage this risk by using degradation curves calibrated to Manitoba Hydro's experience to forecast end of life for the asset classes of concern. Proactive acceleration of replacements to mitigate this risk will only be undertaken as part of a larger asset management plan that blends capital and maintenance interventions with operational risk mitigations to achieve the desired balance of cost, performance and risk.

4.2.3 Manitoba Hydro's Confidence in Test Years Sustainment Investments is High

METSCO alleges that:

> *"Although this indicates a modicum of continuous improvement, in aggregate, the current state of processes underlying Manitoba Hydro's asset management plans as presented in evidence does not enable METSCO to support the applicant's claim that its "confidence level in its proposed sustainment investments is high, in specific reference to that the right assets are being replaced at the right time, and by selecting the most efficient alternative".[38]"*
> (Page 22)

Manitoba Hydro confirms that it has a high confidence level in sustainment investments within the test years and that the right assets are being replaced at the right time. Manitoba Hydro's individual functional operating groups have implemented field-based condition assessment programs that follow a regular cycle and identify the state of health of its asset categories. These condition assessment programs include detailed physical inspections and track and monitor the condition of the assets from which the need for intervention is evaluated based on a risk evaluation. In many cases, the assessment is academic, such as in the case of technical failures. Technical failure refers to a functioning asset that is no longer suitable for its purpose, such as a standing wood pole that no longer meets minimum strength criteria and therefore must be replaced to maintain the reliability of the line as well as assure worker and public safety. These inspections and the corresponding analysis by subject matter and professional experts identify assets requiring intervention or replacement as well as assets that can be maintained to extend their service lives. By evaluating both the replacement as well as the refurbishment options available Manitoba Hydro is able to determine the minimum funding levels required to maintain system operation, and public and employee safety.

One example of inspection practices that yield quantitative results is the integrated pole maintenance testing program. During the 2017 program, 65,790 poles were inspected of which 1,879 poles required replacement due to inadequate remaining strength.

Another example from the 2016/17 fiscal year was the detailed feeder inspection program. Of 128,095 poles inspected, 2,005 high priority poles were identified as requiring replacement and 3,071 were identified as medium priority poles requiring replacement in the near future. These findings provide quantitative evidence of increasing numbers of poles requiring replacement and are representative of the total asset population.

Maintenance and replacement projects that are identified through this process are evaluated against each other to determine the greatest potential risk reduction and value within the established capital targets and available funding levels. This prioritization process ensures that Manitoba Hydro is replacing the right assets at the right time and selecting the most efficient alternative available at the time.

The asset replacements within the test years are predominantly non-discretionary as they are largely reactive or address assets that are in extremely poor condition and put significant risk on the electrical system. The risks and benefits of each investment are weighed against each other and all other proposed work and reviewed by management. The impacts of proceeding, deferring, adjusting scope and even cancelling work were considered within the review process for CEF16.

Manitoba Hydro has also undertaken investments and projects that proactively manage risks and allow for future investments to be deferred or minimized.

The Great Falls Stator Spare Project is an example of managing risks on the generating system to defer capital investments. The Great Falls stators (built circa 1928) have a known design flaw that cannot be fixed. Two of the six stators have already been replaced. It is expected that the remaining four stators will fail in time, but the failures are unlikely to be concurrent. Rather than proactively replace all four stators, a spare stator is being procured and held for use in reaction to an in-service failure. Having a replacement at hand will reduce the resulting outage duration from approximately three years to one year. The lost revenue associated with a unit outage over a year is estimated to be greater than $3M. The spare stator will allow Manitoba Hydro to run the existing stators to their full potential life while managing the risk of lost generation to achieve a reasonable balance between cost and risk.

Manitoba Hydro introduced Distribution Supply Centers (DSCs) in 2000, which utilize a compact “padmount” transformer and standardized equipment found on its underground systems as an alternative to traditional fenced substations. The key benefits of this technology include the fact that they are approximately 40% less expensive than constructing a traditional substation and they eliminate the need for a perimeter fence. The simple and robust design utilizes standardized components that can readily be replaced or repaired in the field, which has reduced construction as well as repair timelines. As of 2017, there are just under 100 Manitoba Hydro and customer-owned DSC's in service across the province which resulted in significant capital savings for Manitoba Hydro.

Manitoba Hydro's HVDC Power Reduction scheme is another example of how Manitoba Hydro has chosen to plan and operate our power system to optimize capital cost and export revenue. Manitoba Hydro's unique use of the Nelson River Bipole 1 & 2 HVDC System has allowed for an additional 1500 MW of Manitoba-to-U.S. transfer capability without the associated transmission line infrastructure additions. Firm transfer capability is achieved through a redundancy of tie-line capability. That is, if one tie-line is lost, the power carried by that line will attempt to flow through the remaining intact tie-lines which must not become overloaded. However, with the rapid control capability of the HVDC system, in the event that a tie-line is lost, the power supplied by the HVDC System can be rapidly reduced so as not to overload the remaining intact tie-lines. Post-disturbance power delivery obligations are met through the MISO contingency reserve sharing pool. The result is an increase in the secure (i.e. firm) transfer capability without the need for additional transmission redundancy.

4.2.4 The Benefits of Optimization and Forecasting Functionality are being Realized

METSCO asserts that *"Absent the investment optimization functionality, it is not clear to METSCO what value the Applicant can derive from this software in the interim, given that the functionality underlies the system's key purpose."* (Page 23)

The objectives of the Capital Portfolio Management Program and the C55 implementation are detailed in Section 5.1.3 Asset Investment Process Improvements of Tab 5 of the GRA, along with an anticipated timeline for achieving the objectives. This work is underway and producing results in all operating groups. The Generation & Wholesale Operating Group being the first to deploy the tools is already piloting common basis risk valuation, scenario analyses and portfolio optimization.

4.2.5 Renewal Budgets Beyond the Test Years are not Currently Driven by Asset End-of-Life Forecasts

METSCO incorrectly concludes that *"As such, and subject to further insights, we conclude that the average probability of failure underlying the Applicant's asset replacement plans is overstated."* (Page 40)

Manitoba Hydro's current asset management practices are targeted at sustaining the historic performance that has resulted in a balance of performance, cost and risk as evidenced by assets living longer than industry average and favourable reliability performance compared to industry.. Past practice has been to assume that past renewal investment requirements are indicative of future mid and long term renewal investment requirements.

While these practices have been successful in the past, it is acknowledged that asset management practices need to be enhanced to better support the mid and long term planning required to enable targeting of a prescribed balance of system performance, cost and risk. These are the processes required to set and optimize future System Renewal budgets based on forecasts of future assets condition, many of which are already under development as described in Tab 5 of the GRA.

Renewal investments beyond the test years will be budgeted based on forecasts of future performance, cost and risk once these planning processes are enhanced. Until then, past renewal investment requirements are the best indicator available of future investment requirements and are used for budgeting purposes outside the test years. By learning from past renewal investment requirements and setting organizational objectives regarding performance, cost and risk Manitoba Hydro will be able to more accurately forecast the appropriate budget levels of renewal investment outside of the test years

4.2.6 Acceleration of Asset Replacements is not Included in the Test Years

METSCO's erroneously assumes that the test years include pre-emptive asset replacements. To reiterate, the test years only include sufficient funding to address immediate priorities.

> *"Lack of Quantification of the Capital-Maintenance Relationship – given its plans for increasing its volumes of asset replacements (particularly in the context of the distribution system) it is a concern that Manitoba Hydro has not undertaken a quantitative assessment of potential maintenance savings associated with higher targeted replacement volumes,[30] in spite of the fact that performing this analysis was among the among the "Key Recommendations" provided by UMS Group.[31]"* (Page 20-21)

METSCO refers to Manitoba Hydro's "*plans for increasing its volumes of asset replacements*". As per Page 8 and 9 of Tab 5 of Manitoba Hydro's GRA "A significant portion of the assets are approaching the end of their expected lives and will require acceleration in replacement rates to maintain distribution system performance over the next twenty years." The acceleration in replacement rates has not yet been planned and the test years include only replacements that are required to maintain the immediate reliability and safety of the system. The acceleration of replacement rates will be considered in portfolio context using the tools and processes currently being deployed under the Capital Portfolio Management Program (as described in Tab 5).

4.2.7 Reliability Centered Maintenance has been Applied to Distribution System Assets

METSCO states *"However, it does not appear from the evidence that the framework is currently used on a consistent basis to drive further improvements, including potential application on the distribution system assets."* (Page 20)

Manitoba Hydro confirms that applicable distribution system assets were included in the T&D Reliability Centered Maintenance Project.

4.2.8 Sustainment Funding is Appropriately Stated

> *"Considering the timing of the report relative to the preparation of Manitoba Hydro's plan, it is reasonable to infer that the use of industry curves may have led Manitoba Hydro to overstate the probability of failure in its determination of asset volumes requiring replacement over the planning period…"* (Page 26)

Manitoba Hydro does not utilize asset failure curves to determine asset replacement requirements or approve asset replacement targets. Manitoba Hydro uses asset failure curves as one of many indicators to predict when an asset may be reaching end of life and identify when further analysis is required to determine the actual condition of an asset. Failure curves are used as a decision support tool as to when asset condition assessments should be done in order to make a determination if refurbishment or replacement of the asset is the best option.

Manitoba Hydro has worked with industry leading professional consultants including Kinectrics to develop failure curves for asset categories based on actual Manitoba Hydro data such as maintenance and failure records. Prior to the creation of these Manitoba Hydro specific failure curves, industry curves were used as a guide, but were adjusted to reflect Manitoba Hydro's specific asset experience, environmental conditions and subject matter expertise to more accurately assess the life time of Manitoba Hydro assets. This customization process resulted in the expected life time and therefore, failure curves of Manitoba Hydro assets being longer than the industry average. This process is discussed in COALITION/MH I-166a-h. In summary, the failure curves are used as a forecasting tool while the findings of the asset condition assessments and corresponding action plans determine the volume of assets that require replacement over the planning period.

4.2.9 Condition is the Primary Driver in Distribution Asset Replacement Planning

METSCO provides that "Lack of Condition-Based Data for Certain Key Distribution Asset Classes (the ultimate drive of this section is the lack of O&M optimization) - the Kinetrics 2016 Distribution Asset Condition Assessment (ACA) report findings rely to a significant degree on age-based data, as indicated by the fact that out of 23 asset classes, the Average Data Availability Index (a measure of the portion of the population for which asset health data was available) was 0% for seven asset classes, and below 50% for another nine types of assets. The lack of asset health data is of particular concern with respect to the Underground Cables (HV-Oil) distribution asset class, over 40% of which is deemed to be in Very Poor condition (and thus, presumably, expected to represent a material portion of replacement work over the coming years), and to a lesser degree for the Duct line and Overhead Switches." (Page 27)

Manitoba Hydro acknowledges that there are Distribution asset classes that did not have sufficient asset health data at the time of the Kinectrics 2016 Asset Condition Assessment report. However, it is important to clarify that the Kinectrics report is not being used to create the asset replacement plans in the test years. The Kinectrics report was initiated to develop condition assessment methodology. The identified gaps are important in understanding where greater asset health data is required and formulating plans for collecting and aggregating the data.

METSCO has misunderstood the findings of the Kinectrics report and the meaning of "flagged for action". Flagged for action does not represent asset replacement or future forecasts of required replacements as METSCO appears to believe. Rather, "flagged for action" means that further investigation is required and the information is being used to help forecast future expenditures beyond the test years including asset maintenance and inspection practices, additional diagnostic information, and required asset replacements.

METSCO's presumption that 40% of the Underground Cables (HV-Oil) distribution asset class being in Very Poor condition represents a material portion of the replacement work in the coming years is incorrect. To clarify this misunderstanding, there are three different classifications of underground cables (Distribution, Sub-Transmission, and High Voltage Oil-Filled Cables). During the test years, there are only projects involving distribution cables which include both rehabilitation and replacement projects. Those cables have an average Data Availability Index of 88%. (Reference PUB MFR 92, Page 14, Table 1).

Only duct lines that have deteriorated (e.g. duct collapse or shifting) are replaced. In 2017/18 one failed segment was replaced near Polo Park along Portage Avenue. Additional future projects are only initiated in the event of an in service failure.

There is no active overhead switch replacement program; however, a separate capital program has been initiated to address inadequate switch ratings on the 66 kV system.

4.2.10 METSCO's Observation of Capital Cost Being Materially Underestimated Is Unfounded

METSCO incorrectly concludes that *"Based on the above calculations, it appears that Manitoba Hydro's capital costs are on average materially underestimated relative to actuals."* (Page 29)

The projects considered by METSCO in this analysis were completed in the last five years (COALITION/MH-I-186). At the time these projects were conceived, the process required that the project budget be estimated and approved prior to any engineering or planning being done to define the project scope. Hence the initial budget estimate was created without a clear definition of scope.

As the project progressed and the scope fleshed out, the estimates were updated and an addendum was approved which is the basis for the "Completion Estimate". As a result, the scope assumed in creating the "Original Estimate" varied significantly from the established scope considered in the "Completion Estimate".

The two estimates therefore do not share a common scope and therefore comparing them is not indicative of estimating performance. This past process has been replaced with the scope development and approval processes described in Section 5.1.2 Asset Investment Planning of Tab 5 of the GRA, which allow for the scope of the project to be developed to a greater level of confidence before the cost is estimated and the investment considered for approval to execute.

4.2.11 Bipole 2 Valve Hall Bushing project is Justified by Mitigating the Operational Risks

METSCO claims that *"Finally, METSCO observes that opportunities may exist to reduce the planned capital expenditures associated with procurement of certain spare inventory parts, such as the Bipole 2 Valve Hall Bushing replacement units, which, based on METSCO's understanding, are being procured to replace the existing inventory of spare* *parts given that the company appears to be changing the equipment standard away from using porcelain oil-filled bushings. While porcelain bushings are indeed considered to be a legacy technology, METSCO sees no reason why the Applicant could not defer the complete conversion to the new technology until such time as the existing inventory of spare units has been used up, considering that the Applicant plans to install the existing spare units should a failure occur between now and the time when the new type of bushings are procured.[95]"* (Page 44)

METSCO's assertion that complete conversion of Bipole 2 Valve Hall Bushings be deferred until the existing inventories of spares are used up ignores the risks associated with failure of oil-filled wall bushings. Failure of one of the eight wall bushings in a pole (i.e. one half of the bi-pole) will result in the loss of the pole representing a loss of1000 MW, roughly equivalent to the loss of the Long Spruce Generating Station. While true that, should a failure occur today, Manitoba Hydro would replace the failed wall bushing with an existing spare, the existing porcelain oil-filled Bipole II wall bushings can and have failed catastrophically, resulting in fire, risking serious injury to staff and collateral damage to adjacent equipment (particularly, the Bipole 2 thyristor valve groups).

Employing a run-to-failure strategy is unacceptable and imprudent due to the associated reliability and loss of generation risk. Proactive replacement of the valve hall bushings is entirely appropriate and necessary given the circumstances. Furthermore, Manitoba Hydro has future plans to replace the Bipole 2 thyristor valves which represent a future investment of $235M. It would be very poor judgement to replace these high value assets by installing them within bushings that are near their end of life and represent a high risk of catastrophic failure and fire. The existing, porcelain oil-filled bushings, are reaching the end of their 35-yr life expectancy. This includes the inventory of spares which are of the same vintage. Although the spare units have not seen service, it is unreasonable to expect to get "like new" performance from a 35-year old organic oil-and-paper insulation system.

Manitoba Hydro reviewed the potential of performing high voltage diagnostic testing on the spare units but due to their age and organic components it was determined that high voltage testing would likely become destructive testing when the bushings were exposed to high voltage test scenarios. While these 35 year old spares would be used as a last resort to restore a lost pole (i.e. 1000 MW), they are not, and should not be considered as true “replacement” units.

4.3 Major Capital

4.3.1 Scope of the GRA with respect to the Review of the Keeyask Project

Manitoba Hydro does not believe that the issue with respect to cancellation of Keeyask falls within the scope of this hearing and will address this issue in Argument. However, for the purposes Rebuttal Evidence, Manitoba Hydro will clarify certain aspects discussed in the evidence submitted by London Economics International (LEI) that are incorrect.

Need Date of 2040 is for New Resources after Keeyask

In response to MH/LEI I-2 (f) LEI states “…that reduced demand has further delayed the need for the [Keeyask] project to 2040” and “Keeyask is not needed to meet Manitoba load until 2040”. These statements are not correct. LEI has misinterpreted the response to GSS-GSM/MH I 5a-b. The response states the need date for new resources of 2039/40 is based on the MH16 Update assumptions, which includes a Keeyask in-service date in 2021. Hence the referenced year of 2040 is for new resources after Keeyask, not the need date for Keeyask. The need date for new resources after Keeyask is further explained in PUB/MH II-45a-e-Attachement 1 (2017 Resource Planning Assumptions and Analysis document). In addition, the capacity and energy contributions for Keeyask are specifically shown as a line item in PUB/MH II-45d allowing for the approximation of need date without Keeyask.

Sunk Costs were Appropriately Considered as Sunk

LEI claims on page 36 of its evidence that sunk costs were “used in making a determination of whether to proceed with a project …”. This claim is incorrect and Manitoba Hydro did not include sunk costs in making a determination of whether or not to proceed with Keeyask. LEI has misinterpreted the response to GSS-GSM/MH I-4 which asks for a breakdown of cancellation costs. Sunk costs were also provided and clearly identified as such in this response to provide context and to clarify what was or was not included in the estimate. Nowhere in the response to GSS-GSM/MH I-4 does

Manitoba Hydro state it or BCG included the sunk costs in making a determination of whether to proceed with Keeyask.

<u>Manitoba Hydro Updated the BCG/ Keeyask Cancellation Analysis</u>

LEI states on page 40 of its evidence that "Manitoba Hydro should be required to perform additional analysis", similar to the BCG work, regarding the cancellation of Keeyask. Manitoba Hydro updated this analysis in 2017 and provided it in Tab 2, Section 2.5.4 of the GRA. This analysis incorporates updated assumptions and provides a Net Present Value comparison of a Project Shut Down scenario with the revised economics for the Keeyask Generating Station Project.

The updated analysis compared a range of real discount rates at both P50 and P90 levels to test for sensitivity. As explained in Tab 2 Section 2.5.4, "The analysis was prepared with a range of real discount rates (WACC) (4.4%, 5.4% and 7.5%) at both P50 and P90 levels to test for sensitivity. These discount rates infer a nominal cost of equity of 8.4%, 12% and 20%, respectively. … The results of this NPV analysis indicated a deterioration of the NPV for the completion of the Keeyask Project compared to the 2016 BCG analysis, but overall the project was still considered to the most economic to complete, compared to halting and building gas-fired generation. Evaluated at 4.4% real WACC, these Projects are positive at P50 (NPV $2.0 billion) and P90 (NPV $1.5 billion)." The Update included a control budget of $8.7 billion, a delayed ISD for the Keeyask Generating Station to 2021, lower Export Prices from previous forecasts, lower Natural Gas Prices from previous forecasts, and lower Domestic Load Growth.

<u>LEI's Statement that continuing with Keeyask is a questionable choice is based on flawed analysis</u>

In Sections 4.3 and 4.4 of their evidence, LEI makes flawed or inappropriate adjustments to the BCG analysis, and comes to the flawed conclusion, at page 41, that continuing with Keeyask is a questionable choice. One of the flaws in the LEI cancellation analysis is that LEI added an increase in the Keeyask project budget announced in February 2017 of $1.5 billion directly to their NPV analysis. The project estimate is in future in-service dollars, and is not a Net Present Value in today's dollars. In order for Figure 26 to be a fair comparison, interest and escalation needs to be removed from the $1.5 billion budget increase.

5. ECONOMIC IMPACTS OF RATE INCREASES

5.1. Macroeconomic impacts

In the responses to MH/Simpson-Compton I-1a, Dr. Simpson and Dr. Compton stated the following:

> *The primary limitations of the methodology are noted in footnote 7 of the report. First, to maintain tractability, the model imposes the assumption that the structure of the economy is constant throughout the time period considered. That is, the economy may shrink and grow but inputs rise and fall in proportion – there is no substitution among inputs. Second, the economy is assumed to operate under conditions of excess capacity – increases in sectoral demand can be met. Third, the model does not include relative price changes or behavioral responses – these we adjusted for manually by altering the price of hydro and maintaining fixed relative prices on all other goods.* (MH/Simpson-Compton I-1a, page 1)

In MH/Simpson-Compton I-6c it was stated that:

> *The model's assumptions (as outlined in the previous responses) require a stable structure in the economy. This assumption becomes less tenable with each additional year added to the analysis. We do not believe that applying the model to the years past seven years of the above inflationary price increases would be informative.* (MH/Simpson-Compton I-6c, page 9)

The limitations of the analysis hinge on the fact that long-term impacts cannot be assessed given the dynamic nature of the structure of the economy. However, the economic impact of any given path of rate increases cannot be compared over relatively short seven year periods. This is particularly the case given the sharply divergent rate path MH16 Update with Interim takes after 2024/25 in comparison to MH16 Update with Interim with MH15 Rates. Under Manitoba Hydro's proposed rate plan, rate increases return to inflationary levels after 2024/25. Per PUB/MH II-21(b), significant rate relief may be available beyond 2026/27 once Manitoba Hydro's balance sheet is restored. Under the MH15 rate plan, 3.95% rate increases continue until at least 2035/36. At this point, electricity rates will have increased by more than 100%. Dr. Simpson and Dr. Compton's analysis considers only the economic impact of the higher early year rate increases with no consideration whatsoever to the impact of sustained increases at double the rate of inflation as compared to the lower rate increase alternatives enabled under Manitoba Hydro's plan.

On page 3-4 of their evidence, Dr. Simpson and Dr. Compton make the following conclusions:

Our preferred estimates indicate that due to the proposed increase in real hydro prices, the Manitoba economy will be 3.4% smaller after seven years than it would have been in the absence of hydro price increases above the inflation rate. Moreover, the hydro price change will result in close to 3900 fewer jobs in the province after seven years than would exist without the price increases. (Evidence of Dr. Simpson & Dr. Compton, page 3-4)

Seven years is not a long enough time-frame to examine for the purposes of determining the full extent of economic impacts caused by electricity rate increases. Rather, a twenty year time-frame ought to be examined inclusive of the accumulated effect of the 3.95% rate path for upwards of 20 years as compared to Manitoba Hydro's plan, which sees a return to inflationary rate increases and the possibility of rate decreases by the end of the next decade. However, in failing to address longer term impacts of comparative rate paths, Dr. Simpson and Dr. Compton provide an incomplete picture.

Moreover, Dr. Simpson and Dr. Compton's analysis compares the Manitoba Hydro proposed rate path to inflationary levels of increase. This is not the appropriate comparison. Manitoba Hydro has provided ample evidence that the MH15 rate path (3.95%) is inadequate. Inflationary rate increases would be more so. In response to MH/Simpson-Compton I-6d, Dr. Simpson and Dr. Compton undertook an analysis to compare the impact of three alternative electricity rate increase trajectories on the level of GDP and employment loss in Manitoba over 7 years. As alternative 1, they use a rate trajectory of 7.9% annual rate increases from 2018/19 to 2024/25. As alternative 2, they use a rate trajectory of 4.14% over 7 years. As alternative 3, they use a rate trajectory of 3.95% annual rate increases from 2018/19 to 2024/25. The difference between alternative rate trajectories 1 and 3 (electricity rate increases of 7.9% and 3.95%, respectively) was a 1.95% reduction in GDP and a loss of 2,209 jobs within the Manitoba economy over 7 years, as demonstrated by the input-output tables used by Dr. Simpson and Dr. Compton. However, as noted above, 7 years is an inadequate timeframe and ignores potential longer term benefits.

5.2. Impact of Rate Increases on the City of Winnipeg

The City of Winnipeg filed intervener evidence prepared by its City Economist, Tyler Markowsky. In his evidence, Mr. Markowsky attempts to quantify the impacts to the City of Winnipeg over the next 20 year period in terms of increased electric utility costs, both direct and indirect, expected to be experienced by the municipal government. He also provides an analysis of the incremental City Tax revenues to be obtained from residential electricity accounts over the same time period.

Unfortunately, Mr. Markowsky's evidence is seriously flawed on several counts. Manitoba Hydro asked several information requests of Mr. Markowsky to ascertain the underlying source data used in his analysis, but the witness declined to provide adequate responses. The Information Requests include:

- MH/Markowsky I-2
- MH/Markowsky I-3 b, c & d
- MH/Markowsky I-6

Notwithstanding the lack of underlying data to support Mr. Markowsky's evidence, observations and conclusions, Manitoba Hydro rebuts several areas of his evidence, as follows.

Mr. Markowsky states that the direct electricity costs to the City of Winnipeg have increased from $22.5 million in 2009 to $29 million in 2016. By interpolating between these two figures, and attempting to adjust these values for the level of rate increase, he attributes a growth in real electricity consumption of 0.5% per year. He then extrapolates the annual bill from 2017 to 2037 at the proposed and indicative rate increases in this Application, to arrive at an annual bill of approximately $75 million by 2037. He calculates the present value of the increase to be $162,349,160 (page 5).

The City of Winnipeg has declined to provide details of annual billing and energy consumption information for 2009 and 2016 which would verify the calculations. Manitoba Hydro notes that billings to the City of Winnipeg include bills for Area and Roadway Lighting for streetlights and for city facilities billed as General Service Small, Medium and Large customer accounts. In addition to changes in consumption, annual bills will be impacted by variables such as customer mix and rate increases affecting various components of the total bill, such as changes in the Basic Monthly Charge and demand charges over the time periods used by Mr. Markowsky in his analysis. Without analysis of the underlying data requested in the above-noted Information Requests, the assumption of 0.5% consumption growth relied upon in Mr. Markowsky's evidence cannot be supported.

Mr. Markowsky also extrapolated the growth in consumption from 2017 to 2037 without consideration for the effects of price elasticity, or for the effects of energy conservation. In response to MH/Markowsky I-2, Mr. Markowsky states:

> *"A price response at the City of Winnipeg would be a choice between incurring incremental costs to reduce consumption and or a reduction of service. Therefore, given that a 0.29% elasticity scenario would need to be balanced by costs or service reduction, which may be larger than the offset in electricity consumption, which are in turn borne by citizens and businesses, the City of Winnipeg chose to produce a non-elasticity scenario for all direct, indirect and revenue cash flows."*

Such an assumption is unrealistic and results in potentially a significant overestimate of future costs to be borne by the City of Winnipeg. Manitoba Hydro has provided technical and financial assistance to the City of Winnipeg for approximately 100 Power Smart projects between 2007 and 2017 and currently there are approximately 50 more projects still in progress. These Power Smart projects are related to energy efficiency improvements in the construction of new civic facilities and in the retrofit of existing buildings. Furthermore, Manitoba Hydro has embarked on a program to replace all streetlights with new high efficiency LED luminaires to retrofit the street lights in the City of Winnipeg with more energy efficient LED technologies.

Power Smart projects, the replacement and retrofitting of aging building stock and replacement of existing street lamps with high efficiency LED luminaires are factors which impact consumption and consumption patterns. It is therefore not reasonable to disregard the effects of energy conservation on electricity costs over the period of 2017 to 2037.

Mr. Markowsky also makes an over-simplified assumption in his calculation of City Tax revenues associated with base load electricity usage by customers in the City of Winnipeg. Manitoba Hydro collects and remits the amounts applied to customer's bills for the City Tax on the base load portion of their monthly bill. The base load portion of the bill is calculated on the sum of the basic charge and the deemed base load, or non-heating related consumption of customers. As noted on page 8 of his evidence, the City Tax is 2.5% for domestic purposes and 5.0% for other than domestic purposes.

In his analysis on page 8, Mr. Markowsky states:

> *"For the purposes of this report, the City of Winnipeg will increase the 2016 taxation revenue first by the forecasted Gross Firm Energy including demand side management (DSM) percentage amount of 0.8% per year (held constant) and then by the projected rate increases."*

Manitoba Hydro verified in the Attachment to MH/Markowsky I-4 that the growth inflator of 0.8% was used for the calculation for the 20 year period from 2017 to 2037.

However, Manitoba Hydro notes that such an inflator understates the growth in taxation revenues, as the City Tax also applies to the Basic Charge on customer's bills. Manitoba Hydro notes in the Attachment to Coalition/COW I-1, the Conference Board of Canada forecasts that housing starts in the City of Winnipeg will continue at a rate of between 4,270 and 4,610 new dwellings per year during the forecast period of 2017 to 2021. ("Total Housing Starts in Economic Indicators on Page 110 of Conference Board of Canada Metropolitan Outlook – Autumn 2017).

Each new dwelling will represent a new electricity account which will be billed, in addition to energy consumed, a basic monthly charge. Therefore, the amount of City Tax forecast strictly by net growth in energy consumption alone will understate the incremental revenues over the 20 year period due to the number of new accounts added and related basic charge revenues to be subject to taxation.

6. COST OF SERVICE

6.1. Implementation of PUB Order 164/16

6.1.1. Manitoba Hydro has reviewed all transmission facilities to identify Generation Outlet Transmission

Mr. Harper's evidence on Cost of Service includes a comprehensive comparison of the methodology used in PCOSS18 to the findings and directives provided by the Public Utilities Board in Order 164/16. His evidence demonstrates that the study is essentially fully compliant with the directives in that Order, while noting the few minor items that remain to be addressed in the study (PUB/Coalition 17).

One area flagged for potential further work is the identification of additional transmission facilities that could be functionalized as Generation Outlet Transmission in the study. In his written evidence, Mr. Harper has provided his understanding of how Manitoba Hydro identified the additional Generation Outlet Transmission during the recent Cost of Service Study ("COSS") methodology review:

> *The actual facilities included are based on recommendations made by GAC and its consultant during the recent COSS Review. What is not clear and has not been confirmed is whether or not there are other generation outlet transmission facilities that meet the Board's criteria and should be functionalized as generation. The Board should direct Manitoba Hydro to review the connection facilities associated with it generating facilities to confirm whether or not there are any other such connection facilities that would meet the "generation outlet transmission" criterion.* (Evidence of Mr. Harper, pages 69-70).

While all the facilities that were added to the Generation Outlet Transmission function were included in the larger group of facilities identified by GAC, Manitoba Hydro has in fact already conducted a review of all transmission facilities to identify those eligible to be functionalized as Generation Outlet Transmission. The list of the facilities functionalized as Generation Outlet Transmission in PCOSS18 has been provided in the response to PUB/MH I-144.

Additionally, the Transmission Service & Compliance Department performs an annual review of transmission lines each summer, as well as during preparation of a tariff study, which would identify any further changes or additional Generation Outlet Transmission facilities in future cost of service studies.

6.1.2. Manitoba Hydro has followed direction regarding Customer Service - General costs

Mr. Bowman in his Evidence asserts that Manitoba Hydro has failed to comply with the direction in Order 164/16 regarding Customer Service – General costs:

> *Hydro has not followed the PUB direction from 164/16 regarding costs in C10. There is no information provided that explains why these costs apply to GSL and why these costs are not already subsumed within the costs categorized in C23 – Industrial & Commercial Solutions.* (Evidence of Mr. Bowman, page 7-11, lines 21-23).

Neither of these assertions is valid.

The PUB's original concerns that GSL customers may have been assigned costs for duplicative services appears to stem from a misunderstanding of the approach used by Manitoba Hydro to functionalize customer service costs in the study. The customer service categories used in PCOSS14 reflected the nature of the different customer services provided by the utility, and were not intended to indicate the department responsible for providing that service. PCOSS14 did not include a specific Industrial & Commercial Solutions subfunction, but rather these costs were distributed between the multiple activities that comprised the C10 Customer Service – General function.

In PCOSS18 the general customer services have now been separated into three distinct categories in order to clearly identify the costs of services provided by: 1) Industrial and Commercial Solutions to GSL customers, 2) the costs of comparable services provided to smaller customers, and finally 3) the remaining general customer services. This revised presentation provides clear evidence that there is no overlap in the allocation of customer service costs.

The generic services in greatest dispute appear to be the Lines Locates and Building Moves & Safety Watches activities included in the revised C10 General Customer Service function.

These activities are not limited to the Distribution facilities used by GSL 0-30kV, but that these activities also include the Subtransmission facilities used by GSL 30-100kV, as well as Transmission voltage facilities required to serve all GSL customers (MIPUG/MH I-11b). These services are provided for the overall protection of Manitoba Hydro's infrastructure for the benefit of the GSL customer class, as well as all other customer classes.

Further, while Mr. Bowman is generally in agreement with the allocation of Education & Safety costs to all customers, he has raised concerns about a potential over assignment of these costs to the GSL customers.

> *This would be an overstatement to GSL, however, as the Education and Safety category is listed to include District Office costs which would appear to include functions such as payment windows which are not of relevance to major customers. However, on bulk, the cost allocation for these categories is likely reasonable.* (Evidence of Mr. Bowman, page 7-9, lines 20-23).

Only the specific costs of district office staff related to education and safety services are included in this subcategory. As previously discussed, with the exception of the recent addition of a separate Industrial & Commercial Solutions subfunction, customer service costs are functionalized based on the nature of the work being performed and not the department/area providing the service. Costs of district staff processing payments are included in C11 Customer Service Billings, and are not part of the Education & Safety costs. Similarly other services provided by district staff are functionalized based on the nature of the activity, such as those included in C12 Collections, or C14 Meter Reading for example.

6.1.3. Non-grid diesel rates are not determined based on results of the PCOSS

In his response to MIPUG/AMC-1 Mr. Raphals has made several observations about the summary of revenue cost coverage ratios provided in PCOSS18 and rate adjustments for the Diesel class.

> *I am not aware of any proposal in this GRA to move the Diesel class to a RCC between 95% and 105%...*
>
> *It is interesting to note that Table 8.12 of Tab 8, which provides the RCC of each rate class, excluding export revenues, does not include the diesel zone.* (MIPUG/AMC – 1, page 2)

Manitoba Hydro believes these statements need to be clarified in the context of this Application.

In this Application Manitoba Hydro is applying for increases only for the grid equivalent portion of the rates applicable to Residential and General Service customers in the diesel rate zone (Tab 9, page 5, line 5-11). The bulk of the revenue for the Diesel class is related to the non-grid rates charged to General Service customers for usage greater than 2,000 kWh per month and to Government and First Nations Education customers. These non-grid rates are determined using a separate diesel cost of service study, which has generally been reviewed as part of a separate regulatory process.

Excluding the Diesel class from summary results shown in Figure 8.12 is a reasonable approach to limit the summary to those classes whose rates may be determined based on the results of this PCOSS18.

Additionally, Figure 8.12 provide the RCC results incorporating each class' share of net export revenue, rather than excluding export revenues as noted by Mr. Raphals. In the case of the Diesel class there is no difference between the ratios pre or post allocation of net export revenues, since this class does not receive a share of exports under the Order 164/16 methodology.

6.2. The Application of Export Revenues to Fund Affordability Programs

6.2.1. Exports are not the appropriate mechanism to broadly share the cost of affordability programs

Mr. Raphals' evidence recommends that the 'cost' of affordability programs should not be recovered solely from Residential customers, and suggests the use of export revenues as a method of ensuring this cost is shared widely by all customer classes (Evidence of Mr. Raphals, page 17).

On pages 16 and 31-33 of his Evidence, Mr. Raphals notes the PUB's recent findings from Order 164/16, which directs that export revenues are to be shared using methods that reflect cost causation in the cost of service study. Mr. Raphals reaches the conclusion that:

> *The Board's finding that "export revenues are not a 'dividend' that can be assigned or based on considerations other than cost causation" refers*

> *specifically to the COSS, and not to the ratemaking process.* ***The GRA is thus the appropriate forum for exploring the application of export revenues to support affordability programs****.* (Evidence of Mr. Raphals, page 33).

This conclusion appears to be based on a misunderstanding of the role that the cost of service study plays in setting rates at Manitoba Hydro. The assignment of costs to exports, and the sharing of the resulting net export revenue between customer classes only occurs within the realm of a cost of service study. Notionally earmarking export revenues to fund bill affordability during the GRA will not change who bears the 'cost' of the programs through a reduction in class RCC ratios, unless this funding is also reflected in the cost of service study.

While Manitoba Hydro is not endorsing a rate payer funded bill affordability program or the specific mechanics of funding, it would suggest that approaches such as a policy of an expanded zone of reasonableness for the affected customer classes would be a much more pragmatic approach than seeking an explicit application of export revenues.

7. <u>BILL AFFORDABILITY & RATE DESIGN</u>

7.1. Bill Affordability, Energy Poverty and Arrears

In this section, Manitoba Hydro clarifies a number of issues related to energy poverty, bill affordability and the Manitoba Hydro led collaborative effort undertaken in accordance with Order 73/15.

7.1.1. Definition of Energy Poverty

Dr. Wayne Simpson in his Evidence (page 4) raises an issue regarding the definition of energy poverty included in the Bill Affordability Working Group's ("Working Group") Report and opines on what he believes would be appropriate to defining energy poverty for Manitobans.

The consensus of the Working Group as to the definition of energy poverty in a Manitoba context was:

> *"Energy Poverty refers to circumstances in which a household is, or would be, required to make sacrifices or trade-offs that would be considered unacceptable by most Manitobans in order to procure sufficient energy from Manitoba Hydro."* (Appendix 10.5, page 15 of 242).

Along with this more conceptual definition, the consultant assisting the Working Group, Prairie Research Associates ("PRA"), recommended some common benchmarks used in other jurisdictions against which Manitoba results could be evaluated. The intent was not to adopt either a 6% energy burden or 10% energy burden as a defining characteristic of energy poverty, but rather to use these benchmarks as a guide to understand the Manitoba data and provide context. These benchmarks were then used as potential qualification criteria when hypothetical program designs were identified, examined and modeled.

Ultimately, any program design might select these or other criteria deemed appropriate within a Manitoba context. Similarly, the use of the LICO 125 measure (as defined by Manitoba Hydro's Affordable Energy Program) was selected for simplicity because this measure was previously adopted by Manitoba Hydro to determine eligibility for its Affordable Energy Program. The Working Group supported the approach Manitoba Hydro had taken in the past and for simplicity adopted it for analysis going forward. If the goal was to restrict participation or target more precisely, a different measure could be adopted.

In terms of discussing the rate increases and the impact on consumers, Dr. Simpson calculates Manitoba Hydro's revised forecast for required rate increases at page 2 of his Evidence as follows, *"Under the new proposal, rates would increase by 6% through 2023-24 followed by an increase of 4.54% in 2024-25, a 48.3% increase over the seven year period."* It appears as though Dr. Simpson has mixed nominal and real increases in this statement. If the intent is to present the increases in real terms under the new indicative rate increases, Manitoba Hydro notes that rates would increase by 6% through 2023-24 followed by an increase of 2.64% in 2024-25, a 45.6% compound increase over the seven year period.

7.1.2. DSM and Bill Affordability programs currently offered by Manitoba Hydro

Indigenous Power Smart

While Mr. Raphals commends the effort of Manitoba Hydro regarding the participation in the Indigenous Power Smart Program, on page 27 of his evidence he indicates that *"…these results testify to a serious effort on the part of Manitoba Hydro to reach First Nations communities"*, he goes on to state *"…there is clearly a long way to go…"*. Mr. Raphals statement appears to be based on limited knowledge of the Indigenous Power Smart Program and the achievements to date.

Through the Indigenous Power Smart Program, Manitoba Hydro works with each community to assess the energy efficiency of the housing in that community and to offer free basic energy saving items and free insulation upgrades, with funding provided for local labour to install all upgrades. The number of estimated on-reserve homes which qualify for insulation upgrades is approximately 3,900 as not all 16,344 on-reserve homes meet the qualifying insulation values (Manitoba Hydro has provided the qualifying insulation values in response to PUB/MH I-126). As of June 30, 2017, 3,051 of those 3,900 homes have received insulation upgrades representing 78% of the available market and not 18.7% as Mr. Raphals indicates on page 27 of his evidence. Manitoba Hydro's serious effort continues to reach on-reserve homes with 3,254 homes having received insulation as of October 31, 2017, thus achieving 83% of the qualifying market.

Launched in December 2014, Manitoba Hydro began the Direct Install of basic energy efficiency measures for on-reserve homes and as of June 30, 2017, 3,298 homes have received upgrades representing 20% market penetration in less than 3 years.

On page 27 of Mr. Raphals' Evidence, he notes his surprise that Manitoba Hydro has one dedicated Indigenous Energy Advisor, however the serious effort he notes on the part of Manitoba Hydro is the result of having only one Indigenous Energy Advisor who is completely dedicated and focused on solely administering the Program to First Nations. The Indigenous Energy Advisor has successfully worked with all 63 First Nations Communities since program launch in the summer of 2008.

In section 4.3 of his Evidence, Mr. Raphals asserts that there is some confusion about programs offered in First Nations Communities. Mr. Raphals correctly notes the Indigenous Power Smart Program is separate from and superior to the Home Insulation Program, however he incorrectly states on page 27 that the Home Insulation Program is part of the Affordable Energy Program. The Home Insulation Program is in fact separate from the Affordable Energy Program and Indigenous Power Smart Program. The Home Insulation Program is a mass market program where a rebate is provided once insulation work is complete and generally the rebate covers the cost of insulation material, not labour. While Mr. Raphals further notes on page 28 of his evidence that under the Home Insulation Program, 49 on-reserve homes have been retrofitted with insulation, he fails to recognize the majority, 38 homes to be exact, were completed prior to the launch of the Indigenous Power Smart Program. Mr. Raphals is also unclear as to how many geothermal systems have been installed in Indigenous communities; however, Manitoba Hydro, working with Aki Energy and the local Indigenous community, has installed geothermal systems in 322 community homes under the Community Geothermal program as of June 30, 2017.

Mr. Raphals states on page 34 of his evidence, *"…Manitoba Hydro has made a real effort to promote energy efficiency in First Nations communities…"* however he alleges that only a small minority of households have benefitted. As of October 31, 2017, Manitoba Hydro has achieved over 30% market participation. With insulation upgrades alone the participation is 83%. Since its inception, the Indigenous Power Smart Program has achieved 1% to 16% participation annually. In its review of the Affordable Energy Program, Dunsky Energy Consulting considers the best in class programs to be those who achieve participation rates of 1% to 4% annually (AMC/MH I-37).

Neighbours Helping Neighbours

Dr. Simpson states on page 8 of his evidence that although Manitoba Hydro provides programs that assist households in budgeting, these are not directed at those who are the energy poor. Dr. Simpson goes on to comment that *"The Neighbours Helping Neighbours program… does provide emergency rate relief through community agencies and private donations…"* Manitoba Hydro is in fact involved in the Neighbours Helping Neighbours program which provides assistance to the energy poor. Through the Neighbours Helping Neighbours program, Manitoba Hydro matches all donations, provides funding for the administration of the program and covers the difference required to meet needs of the program (this was discussed at the 2015/16 & 2016/17 General Rate Application, see GAC/MH I-34f) . As private donations typically average $35,000, Manitoba Hydro is funding the majority of the Neighbours Helping Neighbours (NHN) program.

Affordable Energy Program

Dr. Simpson's comments on page 11 of his evidence, *"Manitoba Hydro's Affordable Energy Program (AEP) seems to be a modest starting point…"* understates the achievements of the program to date and the continued efforts on the part of Manitoba Hydro. In addition, Dr. Simpson mischaracterizes the Report when he states that *"… the Report identifies concerns that program uptake remains modest and that significant barriers to participation may exist…".* While the report states that a variety of factors may be limiting uptake, (such as awareness could be improved, customers not perceiving an immediate need or believing they are eligible or that the benefits are as advertised), Manitoba Hydro aggressively markets its Affordable Energy Program to educate customers on the benefits of the program with mass media efforts as noted further below. Manitoba Hydro's continued efforts have attributed to the success of providing over 20 000 lower income customers with energy efficiency upgrades as of June 30, 2017. Manitoba Hydro is also currently in the midst of creating a video which includes several segments that will provide customers a better visual explanation to minimize language barriers of the benefits and process for a potential or participating Affordable Energy Program customer. This video is expected to be available to customers in early December 2017.

Dr. Simpson has also failed to recognize that the Working Group identified key strengths of the Affordable Energy Program including, participation and savings, accessibility, eligibility, savings and outreach which can be found on page 23 of the Bill Affordability Working Report. Dr. Simpson also appears to ignore the conclusions of the Bill Affordability Working Group Report, at page 24, "*Recent evaluations and studies conducted by other researchers generally reflect positively on the design of the AEP and the results it has achieved to date."*

Dr. Simpson indicates better coordination could be in place to direct customers to initiatives which would assist in managing energy bills, however according to an independent review of Customer Billing Assistance Initiatives by Dunsky Energy Consulting, it notes *"There is significant coordination between the Affordable Energy Program and Bill Assistance program…"* (AMC/MH I-37 Attachment). Since that review, Manitoba Hydro has further enhanced the coordination between programs in March 2017 to ensure increased participation by creating a joint Affordable Energy Program and Neighbours Helping Neighbours application form and continually following up with landlords on behalf of their tenants. Manitoba Hydro is continually looking to increase participation for lower income customers who are struggling with payment of their energy bill such as increased awareness through various media, bill inserts, canvassing, energy advocates, community groups and centres, tradeshows, targeted calling of customers in arrears by the Affordable Energy Program and frontline staff in the Contact Centre and Credit department promoting the AEP. Dr. Simpson's recommendation on page 14 of his evidence is in fact what Manitoba Hydro already has in place.

7.2. Rate design for industrial customers

In his evidence at pages 7-14 to 7-16, Mr. Patrick Bowman for MIPUG discusses the RCC outcomes for the GSL>100 class and proposes that Manitoba Hydro implement a TOU rate structure on an "optional" basis for that customer class. His optional TOU rate design references the illustrative TOU rate scenarios previously prepared by Manitoba Hydro which was based upon revenues and billing determinants for August 1, 2016 rates, and uses those to calculate the revenue loss to Manitoba Hydro. In his proposal, both standard and TOU rates would be designed for the GSL>100 class and each of the 14 customers in the class would have the option to choose from either the standard rate design or the TOU rate design.

The revenues and billing determinants for August 1, 2016 rates are not part of the current GRA and have not been revised or updated for this current rate application. Manitoba Hydro expressed its concerns with introducing a TOU proposal in "Rate Design Policy Issues" on pages 3 to 4 of Tab 9 of this Application. Furthermore, Manitoba Hydro notes the necessity to revisit such a rate design proposal, in light of the changes to Cost of Service arising from Order 164/16 and discussed in the response to MIPUG/MH I-5b. Please also refer to Manitoba Hydro's response to MIPUG/MH I-5a for the source and limitations of the illustrative rate scenario provided.

Manitoba Hydro notes that the potential impact to individual customers of a TOU rate design varies significantly, depending upon their energy usage patterns and the degree to which they may be able to shift energy usage between time periods during the day. For example, the range of bill impacts by each of the fourteen customers in the GSL>100 class under the illustrative August 1, 2016 rate design scenario was shown in the response to MIPUG/MH I-5c, and is provided in more detail below.

	Bill Impact of TOU vs Standard GSL > 100 Rate Design ($)	Customer under TOU rate design
Customer 1	900,200	Higher bill
Customer 2	438,500	Higher bill
Customer 3	140,300	Higher bill
Customer 4	114,700	Higher bill
Customer 5	39,500	Higher bill
Customer 6	36,800	Higher bill
Customer 7	400	Higher bill
Customer 8	(29,700)	Lower bill
Customer 9	(70,800)	Lower bill
Customer 10	(96,900)	Lower bill
Customer 11	(103,800)	Lower bill
Customer 12	(221,500)	Lower bill
Customer 13	(294,400)	Lower bill
Customer 14	(711,000)	Lower bill
7 customers	$ (1,528,100)	Lower revenues - TOU
7 customers	$ 1,670,400	Higher revenues - TOU

Therefore, in the illustrative rates in the scenario shown above, one half of the GSL > 100 customers would have an economic incentive to choose the TOU rate option and the other half would benefit from remaining on the standard rate design. This situation opens the door to self-selection by customers, based solely on their potential to benefit from one rate design or the other.

The result of the potential self-selection by GSL > 100 customers is that only customers whose bills could be lower under the TOU option would switch rates and therefore Manitoba Hydro would see a revenue shortfall of approximately $1.5 million for the GSL > 100 class.

Mr. Bowman acknowledges that Manitoba Hydro, in this scenario, may experience revenue losses of approximately $1.5 million based on the 2016 TOU rate design proposal due to the self-selection of customers favored by such a rate design (Page 7-15 line 20 to

Page 7-16 line 2). It appears that Mr. Bowman is suggesting that Manitoba Hydro should simply absorb such a revenue shortfall.

On page 7-16, Mr. Bowman suggests that the current RCC of the GSL>100 kV class is 112.3%, and could drop to 111.4% with the implementation of optional TOU rates. Manitoba Hydro notes that Mr. Bowman has chosen to refer to RCC's derived by an alternative calculation of RCC in his proposal that generates a more extreme set of RCC outcomes. Mr. Bowman's calculation of an RCC of 112.3% for GSL>100kV corresponds to an RCC of 108.6% as determined by Manitoba Hydro in PCOSS18 using its traditionally accepted methodology. As noted in the response to GSS-GSM/MH I-9, Manitoba Hydro has historically treated net export revenues as additional revenue, rather than as an offset of costs when calculating RCC ratios.

In order to address the RCC outcomes of the GSL>100 kV class there should be a transparent and deliberate determination of the appropriate level of revenue to be collected from the GSL > 100 class, and that any reduced level of revenue must be then recovered from other customers in order to keep Manitoba Hydro whole in the recovery of its total revenue requirement. Unfortunately, Mr. Bowman is attempting to use a rate design proposal to pursue an outcome of reducing the overall level of revenue responsibility for the GSL > 100 class instead of addressing it properly at the class level. The appropriate level of revenues should be explicitly dealt with by viewing the class by class RCC outcomes of PCOSS18 and determining whether there should be any deliberate shift in revenue responsibility between rate classes, prior to designing tariffs at the rate design stage.

In other words, if the likely outcome of an optional TOU rate offering is a net reduction of revenues of $1.5 million, that revenue must be made up either from other non-participating GSL>100 kV customers, by increasing the level of the standard rate, or it must be made up from customers in other rate classes.

7.3. Demand Charges in Rate Design

Mr. Chernick, at pages 39 to 42 of his evidence, advises the PUB to consider reducing or eliminating demand charges in the design of rates for general service customers.

Contrary to Mr. Chernick's opinion, demand charges do provide a meaningful price signal to general service customers, in that electricity service consists of both the supply of energy and the provision of capacity to meet those customers' peak load requirements.

Distribution feeders, substations, sub-transmission and transmission facilities are designed to accommodate the planned peak loads on the system, and the Corporation is contractually obligated to serve customers to the level of their required peak demand.

In addition, demand charges also provide the Corporation with a greater degree of revenue stability, which is also an important rate making consideration.

Demand charges give customers a price signal as to the cost of the capacity requirements that they impose on the system, the information to make better decisions around the management of peak demand, and an incentive to manage these peak demands. Without such an incentive, customers may place greater demand on the system than they would otherwise, which can result in increased capacity requirements on the system and increased costs to be borne by all customers.

7.3.1. Determination of Monthly Billing Demand

On pages 42 and 43 of his evidence, Mr. Chernick expresses his view that Manitoba Hydro should eliminate demand ratchets or minimum billing demand provisions from its GSM and GSL tariffs.

The monthly billing demand for General Service Medium (over 200 kVA) and General Service Large customers is the greater of either:

1. measured demand; or
2. 25% of the contract demand; or
3. 25% of the highest measured demand in the previous 12 months.

Mr. Chernick has several criticisms of demand charges on page 43 of his evidence. He suggests that demand ratchets and contract demand provisions provide no incentive to reduce energy usage in low demand months (under 25% of the highest measured demand in the previous 12 months) and excessively penalize customers for marginal usage in the highest demand months, which in his view provides confusing and misleading price signals.

However, minimum billing demand and contract demand provisions reinforce the price signal to customers of the cost of demand that they impose on the Manitoba Hydro system. The cost of capacity and energy are shown separately on bills and customers can assess these costs in making their electricity usage decisions. In addition, contract demand provisions also encourage customers to more carefully assess their capacity requirements when adding load to the system. Without contract demand provisions, customers may contract for excess capacity "just in case" it may be needed in the future. This capacity must then be constructed and reserved for that customer, and a contract demand provision provides for some level of ongoing revenue recovery for that additional capacity.

Lastly, Mr. Chernick suggests that demand bill impacts may arise for customers who unintentionally establish a new maximum contract demand. Manitoba Hydro notes that customers that inadvertently set a new maximum demand level may contact a customer representative to explain their specific circumstances and potentially have their billing demand level reviewed and adjusted.

7.4. Appropriateness of G, T & D marginal cost estimates

7.4.1. Generation Marginal Cost Component Details are Commercially Sensitive Information

On September 21, 2017, Manitoba Hydro filed a Motion with the PUB seeking confidential treatment for a number of Manitoba Hydro's Information Requests responses, including PUB/MH I-131b-c which requested generation marginal cost component details. The PUB subsequently issued Order 112/17 in which the PUB found that it would receive the information contained in PUB/MH I-131b-c in confidence under Rule 13(2) of its Rules of Practice & Procedure as it is derived from or closely related to the electricity export price forecast.

Despite this ruling, Mr. Chernick, in his October 31, 2017 Direct Testimony, continues to object to the confidential treatment of the detailed information on the generation component of marginal cost and spends a portion of his report discussing why he believes the information should be disclosed. Manitoba Hydro will not be addressing this portion of Mr. Chernick's evidence as the PUB has already determined that generation marginal cost component details are commercially sensitive information.

7.4.2. Mr. Chernick's Assessment of Transmission and Distribution Marginal Costs

Mr. Chernick raises several general objections to Manitoba Hydro's method of calculating transmission and distribution marginal costs (also referred to as avoided costs) at pages 12 - 21.

While differing approaches can be taken, many of Mr. Chernick's objections seem to be based on factual misunderstandings of Manitoba Hydro's methodology. Manitoba Hydro uses a One Year Deferral (OYD) method to calculate a $/kW/yr marginal (avoided) cost; that is, the value of deferring one kW of installed capacity for one year (GAC/MH II-18a-b Attachment 2, page 12). The method involves identifying the load-growth related capital expenditures within a 10-year planning horizon, levelizing those expenses for uniform annual investment, and comparing the value of a one-year deferral of those levelized annual investments to the forecasted average annual load growth (over the same 10-year period) to arrive at the $/kW/yr marginal cost.

In this avoided cost calculation, it is important to only include those costs that can indeed be deferred. For this reason, Manitoba Hydro does not include projects in the current fiscal year (i.e. "year zero") which typically cannot be deferred, nor does Manitoba Hydro include sunk costs from previous years. While Manitoba Hydro considers projects that began prior to the 10-year planning horizon, Manitoba Hydro considers only the future expenditures in the avoided cost calculation (i.e. beyond year-zero). Mr. Chernick's opinion on pages 14, 18, and 24 of his evidence that sunk costs ought to be included in an avoided cost calculation is not shared by Manitoba Hydro as only what can truly be avoided should be included.

On page 15 of his evidence, Mr. Chernick expresses concern that transmission and distribution marginal costs may be underestimated due a "lack" of committed projects in the later test years. Manitoba Hydro acknowledges that fewer committed projects are identified in the later years of the 10-year planning horizon than are identified in the early years. Manitoba Hydro has appropriately remedied this "drop off" by extending the average spend to the end of the planning horizon. This approach recognizes both the need for future projects (whose scope may not yet be fully defined) and Manitoba Hydro's resource capacity to perform that capital work. As such, it is a reasonable extrapolation of the data.

Mr. Chernick disagrees with Manitoba Hydro's categorization of load-growth related expenses (i.e. which projects to include in the avoided cost analysis). He cites several examples of projects that he feels ought to have been included in the analysis, which are discussed below. However, in each and every case, these are projects that would not be deferred as a result of a reduction in load growth; that is, projects that address current issues serving existing load (e.g. Transmission Line Upgrades for NERC Alert on page 19, or the St. Vital Station, McPhillips Station and Anola DSC on pages 22-23), or spending that is clearly categorized as something other than load related (such as the domestic capital categories of "Reliability: Outage" or "Reliability: Imports/Exports" on page 20). In the broadest sense, any expense can be considered "load related" since Manitoba Hydro's mission is to deliver electricity to customers; however, for the purpose of calculating marginal or avoided transmission and distribution costs, the "litmus test" is whether or not these expenses could be avoided/deferred by a reduction in load growth. Where projects are not 100% load growth related, Manitoba Hydro has identified the appropriate percentage. Furthermore, with regards to the division between transmission and distribution marginal costs, Mr. Chernick mistakenly assumes that transmission level loads have been included in the calculation of distribution marginal cost, thus understating the distribution marginal cost (Mr. Chernick's Evidence, page 25). Specifically, Mr. Chernick assumes that transmission voltages begin at 30 kV and up. This assumption is incorrect. Distribution loads are served up to 66 kV; this includes major industrial load served at 66 kV.

On page 14 of his evidence, Mr. Chernick objects to Manitoba Hydro's application of a 100% load factor to transmission and distribution marginal costs rather than applying a "load shape" by class. What Mr. Chernick may not understand is that transmission and distribution load-growth related capacity projects are planned, by necessity, to accommodate peak load, not a percentage of peak load. The result is the marginal cost of incremental capacity additions in $/kW/yr. Load shapes and load factors are applied later when Transmission and Distribution's capacity based marginal costs are combined, on an energy basis, with Generation's marginal costs to arrive at a ¢/kW.hr figure. As noted in the response to COALITION/MH II-27a-b, the all-In marginal costs utilizing a 100% load factor are provided for year to year comparison purposes.

Mr. Chernick claims that Manitoba Hydro fails to recognize that O&M costs associated with load-related projects are also load-related (Mr. Chernick's evidence page 17). Manitoba Hydro has never failed to recognize that O&M costs associated with load-related projects are also load related. Rather, these incremental O&M costs are excluded from the analysis because they amount to only 1% to 2% of the capital costs of the capacity addition. As well, Mr. Chernick's parenthetical statement that increased loading leads to increased failures is generally incorrect. Manitoba Hydro's system is planned for contingency operation, meaning that there is sufficient redundancy such that equipment would only be operated to its maximum capability following an equipment outage. In a "system intact" state, equipment is operated well below its maximum rating.

Mr. Chernick claims that he is unable to confirm Manitoba Hydro's calculations due to the complexity of Manitoba Hydro's analysis and incompleteness of information provided (Mr. Chernick's Evidence page 13). Manitoba Hydro's Transmission and Distribution marginal cost methodology, based on a one-year deferral method, is simple to understand and to apply, and has been summarized in a single equation in response to GAC/MH I-39 Attachments, page 8. The supplied reports are transparent and complete, and even provide a "computational map" to guide the reader in the calculation of Manitoba Hydro's marginal cost from the tabulated data provided in response to GAC/MH I-39 Attachments, page 27. The transmission marginal cost report includes a complete project list; the distribution project list was supplied in response to GAC/MH II-22a-i. All the information needed to reproduce Manitoba Hydro's results has been provided.

7.5. Supplementary regressions to explore the determinants of energy burden

Manitoba Hydro notes that Mr. Raphals footnote #20 on page 12 of his evidence states that there appears to be a contradiction with respect to Table 6 Estimated Electricity Revenue Losses Associated with Affordability Measures and PRA's restated conclusions in AMC/MH II-29. Mr. Raphals appears to have overlooked that the restated PRA conclusions in AMC/MH II-29 include both gas and electric revenue losses whereas Table 6 deals solely with electric revenues.

Dr. Simpson makes the following comments on page 12 of his evidence in response to the analysis undertaken by PRA:

> *The Report also presents regression analysis to explain energy poverty. In my view, these results are not particularly useful, since the dependent variable is whether a household is energy poor or not… A more informative exercise would have been one that used the threshold share of income spent on energy (6% and 10%) as the dependent variable and*

then investigated how income affected the likelihood of rising above this threshold in conjunction with other variables (household characteristics).

In response to these comments, PRA conducted the following additional statistical analysis:

- Logit – energy poverty as dependent variable (6% threshold) – from original PRA report
- Logit – energy burden as dependent variable (6% threshold) with income included on RHS
- Logit – energy burden as dependent variable (6% threshold) with income excluded on RHS
- OLS – energy burden as dependent variable (continuous) with income excluded on RHS
- GMM – energy burden as dependent variable (continuous) with income included on RHS

The results of this analysis can be found in Appendix 7.1 to this Rebuttal. As noted by PRA in the Appendix, PRA's conclusion after having completed the analysis is that neither the original nor the additional analysis is useful in shedding light on the determinants of energy burden.

It is important to stress that the low reliability of these statistical models in no way affects the simulations of how increased Hydro rates will affect the energy burden experienced by Manitoba households. The simulations use no results from these statistical models.

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update w/ Interim with Bowman and 20-Year WATM at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	116	181	247	319	392	469	552	641	735
BPIII Reserve Account	(96)	(151)	3	79	79	79	79	26	-	-	-
Extraprovincial	460	514	469	420	567	693	779	788	805	667	671
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 184	2 263	2 463	2 670	2 826	2 859	2 944	2 909	3 024
EXPENSES											
Operating and Administrative	536	518	501	511	513	524	536	548	559	571	583
Finance Expense	608	590	698	782	874	959	1 216	1 265	1 277	1 276	1 298
Finance Income	(17)	(17)	(21)	(29)	(35)	(34)	(37)	(14)	(14)	(13)	(15)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	739	752
Water Rentals and Assessments	131	130	120	110	113	117	127	128	131	131	131
Fuel and Power Purchased	132	124	140	158	165	156	140	135	138	127	129
Capital and Other Taxes	119	132	145	154	161	166	174	175	176	177	177
Other Expenses	60	116	109	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 998	2 171	2 692	2 449	2 584	2 925	3 023	3 068	3 086	3 139
Net Income before Net Movement in Reg. Deferral	(46)	10	13	(429)	14	85	(99)	(164)	(124)	(177)	(115)
Net Movement in Regulatory Deferral	66	72	115	473	82	78	59	50	50	51	55
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	82	128	44	97	163	(40)	(114)	(74)	(126)	(59)
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	90	129	41	91	154	(50)	(125)	(78)	(128)	(63)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**90**	**129**	**41**	**91**	**154**	**(50)**	**(125)**	**(78)**	**(128)**	**(63)**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	82	128	44	97	163	(40)	(114)	(74)	(126)	(59)
* Additional Domestic Revenue											
Percent Increase		3.36%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%
Cumulative Percent Increase		3.36%	7.44%	11.69%	16.10%	20.68%	25.45%	30.41%	35.56%	40.91%	46.48%
Financial Ratios											
Equity	16%	15%	14%	13%	13%	13%	12%	12%	12%	11%	11%
EBITDA Interest Coverage	1.51	1.53	1.61	1.54	1.57	1.64	1.54	1.49	1.53	1.50	1.56
Capital Coverage	1.53	1.39	1.33	1.15	1.36	1.59	1.30	1.25	1.23	1.13	1.21

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update w/ Interim with Bowman and 20-Year WATM at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	835	940	1 001	1 065	1 137	1 213	1 291	1 374	1 460
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	662	677	697	709	705	701	696	694	602
Other	36	37	38	38	39	40	40	40	41
	3 133	3 269	3 366	3 460	3 555	3 654	3 756	3 865	3 889
EXPENSES									
Operating and Administrative	595	607	620	633	646	660	674	688	702
Finance Expense	1 306	1 307	1 293	1 266	1 227	1 212	1 192	1 170	1 130
Finance Income	(14)	(18)	(21)	(18)	(20)	(23)	(29)	(36)	(28)
Depreciation and Amortization	765	776	790	805	822	840	856	872	888
Water Rentals and Assessments	132	132	132	133	133	133	134	134	134
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	179	180	181	183	185	186	188	190	196
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	6	4	4	4	4	4	4
	3 179	3 210	3 227	3 240	3 215	3 231	3 246	3 259	3 255
Net Income before Net Movement in Reg. Deferral	(46)	59	139	220	340	423	510	606	634
Net Movement in Regulatory Deferral	57	61	67	69	72	75	76	76	75
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	11	120	206	289	411	498	586	682	709
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	7	114	198	279	400	485	571	666	692
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**7**	**114**	**198**	**279**	**400**	**485**	**571**	**666**	**692**
Non-controlling Interest	4	6	8	10	11	13	14	16	16
	11	120	206	289	411	498	586	682	709
* Additional Domestic Revenue									
Percent Increase	3.95%	3.95%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Percent Increase	52.26%	58.28%	61.44%	64.67%	67.97%	71.33%	74.75%	78.25%	81.81%
Financial Ratios									
Equity	11%	12%	12%	13%	15%	17%	19%	21%	23%
EBITDA Interest Coverage	1.62	1.71	1.79	1.88	2.02	2.12	2.23	2.36	2.43
Capital Coverage	1.32	1.44	1.59	1.63	1.81	1.91	2.02	1.98	1.99

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update w/ Interim with Bowman and 20-Year WATM at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 166	30 501	31 031	31 667	32 331	32 942
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 705)	(4 328)	(4 942)	(5 607)	(6 212)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 042	26 796	26 703	26 724	26 725	26 730
Construction in Progress	7 079	9 471	6 745	7 523	8 012	3 837	370	457	421	417	414
Current and Other Assets	1 773	1 913	2 186	2 447	2 655	1 845	1 589	1 576	1 519	1 868	1 690
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 304	27 045	28 402	30 147	30 025	30 010	29 947	29 831	30 132	29 915
Regulatory Deferral Balance	462	534	649	1 121	1 204	1 281	1 340	1 390	1 440	1 491	1 546
	21 733	24 838	27 694	29 523	31 350	31 306	31 351	31 337	31 271	31 624	31 461
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 389	23 594	23 639	24 864	24 740	24 452	24 391	25 233
Current and Other Liabilities	3 204	3 644	3 052	3 823	4 369	4 158	3 040	3 199	3 488	4 019	3 068
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	344	265	185	106	26	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 839	2 968	3 010	3 101	3 255	3 206	3 081	3 003	2 875	2 812
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(496)	(439)	(344)	(343)	(343)	(343)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 789	27 645	29 474	31 302	31 257	31 302	31 288	31 222	31 575	31 413
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 838	27 694	29 523	31 350	31 306	31 351	31 337	31 271	31 624	31 461
Net Debt	15 427	18 474	20 825	22 657	23 809	24 496	24 761	24 812	24 880	24 999	25 066
Total Equity	2 856	3 160	3 425	3 521	3 638	3 798	3 441	3 406	3 343	3 229	3 181
Equity Ratio	16%	15%	14%	13%	13%	13%	12%	12%	12%	11%	11%

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update w/ Interim with Bowman and 20-Year WATM at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
ASSETS									
Plant in Service	33 550	34 296	34 956	35 787	36 563	37 358	38 102	38 904	39 972
Accumulated Depreciation	(6 906)	(7 602)	(8 311)	(9 040)	(9 788)	(10 576)	(11 365)	(12 168)	(12 975)
Net Plant in Service	26 644	26 693	26 645	26 747	26 776	26 782	26 737	26 737	26 997
Construction in Progress	495	457	493	403	377	369	409	464	260
Current and Other Assets	2 136	2 404	2 764	2 230	2 825	3 277	3 864	4 457	4 817
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	30 316	30 556	30 864	30 303	30 863	31 275	31 819	32 430	32 810
Regulatory Deferral Balance	1 603	1 664	1 731	1 800	1 871	1 947	2 022	2 098	2 174
	31 919	32 220	32 595	32 103	32 734	33 222	33 841	34 529	34 983
LIABILITIES AND EQUITY									
Long-Term Debt	25 765	25 908	25 295	25 265	25 489	25 452	25 456	25 095	24 979
Current and Other Liabilities	2 976	3 011	3 793	3 043	3 041	3 071	3 105	3 478	3 345
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	2 819	2 933	3 131	3 410	3 810	4 295	4 866	5 532	6 224
Accumulated Other Comprehensive Income	(343)	(343)	(343)	(343)	(343)	(343)	(343)	(343)	(343)
Total Liabilities and Equity before Regulatory Deferral	31 871	32 171	32 546	32 054	32 685	33 173	33 793	34 480	34 935
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	31 919	32 220	32 595	32 103	32 734	33 222	33 841	34 529	34 983
Net Debt	25 052	24 950	24 748	24 495	24 103	23 630	23 060	22 452	21 823
Total Equity	3 202	3 322	3 527	3 814	4 222	4 715	5 295	5 970	6 673
Equity Ratio	11%	12%	12%	13%	15%	17%	19%	21%	23%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update w/ Interim with Bowman and 20-Year WATM at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 170	2 173	2 371	2 577	2 734	2 821	2 931	2 897	3 011
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(870)	(885)	(894)	(904)	(916)	(934)	(934)	(948)
Interest Paid	(553)	(532)	(652)	(734)	(814)	(909)	(1 161)	(1 233)	(1 246)	(1 246)	(1 274)
Interest Received	17	5	12	22	26	19	7	6	7	6	8
	810	733	686	591	698	794	676	678	759	722	797
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 360	2 590	1 180	1 570	390	390	1 150	990
Sinking Fund Withdrawals	146	0	0	120	318	813	182	54	350	156	254
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(248)	(261)	(271)	(267)	(275)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(10)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 861	1 308	263	374	(112)	52	318	(214)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 659)	(3 002)	(2 391)	(1 760)	(1 368)	(898)	(720)	(724)	(752)	(776)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 748)	(3 059)	(2 438)	(1 850)	(1 476)	(997)	(816)	(820)	(834)	(858)
Net Increase (Decrease) in Cash	(309)	(147)	(7)	14	156	(420)	53	(249)	(9)	206	(274)
Cash at Beginning of Year	943	634	487	480	494	650	230	283	33	24	231
Cash at End of Year	634	487	480	494	650	230	283	33	24	231	(44)

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update w/ Interim with Bowman and 20-Year WATM at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 120	3 255	3 352	3 446	3 540	3 640	3 741	3 851	3 874
Cash Paid to Suppliers and Employees	(962)	(979)	(996)	(1 019)	(1 015)	(1 028)	(1 049)	(1 073)	(1 083)
Interest Paid	(1 282)	(1 303)	(1 300)	(1 288)	(1 217)	(1 220)	(1 213)	(1 206)	(1 178)
Interest Received	14	29	39	47	24	40	58	80	78
	889	1 002	1 095	1 186	1 333	1 432	1 538	1 651	1 691
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	590	190	210	(20)	190	(50)	(30)	(60)	(20)
Sinking Fund Withdrawals	150	60	110	796	13	30	0	10	275
Sinking Fund Payment	(276)	(283)	(291)	(300)	(275)	(287)	(297)	(309)	(321)
Retirement of Long-Term Debt	(150)	(60)	(80)	(796)	(13)	0	20	20	(275)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(5)	(5)
	309	(98)	(57)	(325)	(90)	(314)	(311)	(343)	(345)
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(787)	(818)	(813)	(852)	(860)	(877)	(890)	(968)	(986)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(867)	(893)	(884)	(925)	(933)	(948)	(960)	(1 036)	(1 053)
Net Increase (Decrease) in Cash	331	11	154	(64)	310	170	267	273	293
Cash at Beginning of Year	(44)	287	299	453	389	699	869	1 136	1 408
Cash at End of Year	287	299	453	389	699	869	1 136	1 408	1 701

ELECTRIC OPERATIONS (MH16)
PROJECTED OPERATING STATEMENT
MFR77i - 50% of proposed DSM & 50% of expected savings
(In Millions of Dollars)

For the year ended March 31	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
REVENUES											
General Consumers											
at approved rates	1 517	1 569	1 572	1 577	1 585	1 594	1 607	1 620	1 634	1 646	1 659
additional*	0	88	257	404	563	737	790	845	902	959	1 019
BPIII Reserve Account	(96)	(119)	8	71	71	71	71	24	0	0	0
Extraprovincial	468	454	426	444	565	679	769	789	811	665	668
Other	27	30	31	31	33	33	34	34	35	35	36
	1 915	2 022	2 294	2 527	2 816	3 114	3 270	3 311	3 381	3 306	3 382
EXPENSES											
Operating and Administrative	535	518	502	512	513	524	536	548	559	571	583
Finance Expense	613	574	662	719	768	821	1 036	1 064	1 049	1 025	978
Finance Income	(18)	(16)	(20)	(27)	(26)	(32)	(39)	(22)	(29)	(32)	(22)
Depreciation and Amortization	384	396	471	515	554	597	689	714	725	739	751
Water Rentals and Assessments	131	124	112	113	114	118	127	128	131	131	131
Fuel and Power Purchased	130	135	169	151	171	157	146	145	150	134	136
Capital and Other Taxes	118	132	144	153	160	164	173	173	173	173	173
Other Expenses	60	115	59	434	50	48	38	34	36	37	40
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 962	1 987	2 107	2 579	2 312	2 404	2 714	2 791	2 803	2 786	2 779
Net Income before Net Movement in Reg. Deferral	(47)	35	188	(53)	504	709	556	520	579	520	603
Net Movement in Regulatory Deferral	69	68	57	420	34	32	25	(57)	(56)	(54)	(49)
Net Income	22	102	244	367	538	742	582	462	523	467	554
Net Income Attributable to:											
Manitoba Hydro	**34**	**111**	**245**	**365**	**533**	**733**	**572**	**451**	**520**	**465**	**551**
Non-controlling Interest	(12)	(9)	(1)	2	5	8	9	11	3	2	3
* Additional General Consumers Revenue											
Percent Increase	0.00%	7.90%	7.90%	7.90%	7.90%	7.90%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Percent Increase	0.00%	7.90%	16.42%	25.62%	35.55%	46.25%	49.18%	52.16%	55.21%	58.31%	61.48%
Financial Ratios											
Equity	15%	15%	14%	15%	16%	19%	20%	21%	23%	25%	27%
EBITDA Interest Coverage	1.50	1.57	1.77	1.90	2.04	2.26	2.22	2.18	2.28	2.27	2.42
Capital Coverage	1.08	1.31	1.50	1.71	2.16	2.69	2.43	2.41	2.28	2.11	2.21

ELECTRIC OPERATIONS (MH16)
PROJECTED OPERATING STATEMENT
MFR77i - 50% of proposed DSM & 50% of expected savings
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
REVENUES									
General Consumers									
at approved rates	1 671	1 683	1 704	1 725	1 754	1 785	1 818	1 851	1 886
additional*	1 080	1 144	1 215	1 289	1 372	1 460	1 553	1 650	1 753
BPIII Reserve Account	0	0	0	0	0	0	0	0	0
Extraprovincial	655	662	668	674	673	667	658	652	550
Other	36	37	38	38	39	40	40	40	41
	3 442	3 527	3 625	3 727	3 837	3 952	4 069	4 193	4 230
EXPENSES									
Operating and Administrative	595	608	620	633	647	660	674	688	703
Finance Expense	960	945	900	852	801	758	706	667	625
Finance Income	(32)	(47)	(32)	(16)	(19)	(20)	(26)	(44)	(59)
Depreciation and Amortization	764	775	790	804	822	840	856	871	887
Water Rentals and Assessments	131	132	132	132	133	133	133	133	132
Fuel and Power Purchased	136	140	145	157	166	177	193	209	205
Capital and Other Taxes	173	174	175	176	177	178	179	180	186
Other Expenses	42	44	46	46	47	48	48	50	50
Corporate Allocation	8	8	5	2	2	2	2	2	2
	2 778	2 778	2 780	2 786	2 774	2 776	2 765	2 757	2 732
Net Income before Net Movement in Reg. Deferral	664	749	845	941	1 063	1 177	1 304	1 437	1 498
Net Movement in Regulatory Deferral	(46)	(41)	(39)	(37)	(36)	(34)	(35)	(34)	(35)
Net Income	618	707	806	904	1 027	1 143	1 270	1 403	1 463
Net Income Attributable to:									
Manitoba Hydro	**615**	**703**	**799**	**894**	**1 016**	**1 130**	**1 256**	**1 388**	**1 448**
Non-controlling Interest	4	5	7	9	11	12	14	15	15
* Additional General Consumers Revenue									
Percent Increase	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Percent Increase	64.71%	68.00%	71.36%	74.79%	78.28%	81.85%	85.49%	89.19%	92.98%
Financial Ratios									
Equity	30%	32%	35%	39%	43%	47%	52%	57%	63%
EBITDA Interest Coverage	2.54	2.68	2.87	3.07	3.40	3.71	4.14	4.63	5.10
Capital Coverage	2.28	2.33	2.51	2.53	2.70	2.83	2.99	2.89	2.92

ELECTRIC OPERATIONS (MH16)
PROJECTED BALANCE SHEET
MFR77i - 50% of proposed DSM & 50% of expected savings
(In Millions of Dollars)

For the year ended March 31	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
ASSETS											
Plant in Service	13 256	13 881	19 254	19 876	20 938	26 363	30 693	31 222	31 858	32 522	33 133
Accumulated Depreciation	(985)	(1 319)	(1 749)	(2 197)	(2 634)	(3 143)	(3 724)	(4 347)	(4 961)	(5 625)	(6 231)
Net Plant in Service	12 272	12 562	17 505	17 679	18 304	23 219	26 969	26 876	26 897	26 897	26 902
Construction in Progress	6 943	9 308	6 596	7 378	7 870	3 693	224	312	276	272	269
Current and Other Assets	1 721	1 909	2 328	2 564	2 224	1 990	1 884	2 165	2 414	2 248	2 143
Goodwill and Intangible Assets	270	485	725	869	1 271	1 225	1 180	1 135	1 092	1 049	1 007
Total Assets before Regulatory Deferral	21 206	24 264	27 154	28 490	29 669	30 128	30 256	30 489	30 679	30 466	30 321
Regulatory Deferral Balance	459	526	583	1 003	1 037	1 069	1 094	1 037	981	928	879
	21 665	24 790	27 737	29 493	30 705	31 197	31 350	31 526	31 661	31 394	31 200
LIABILITIES AND EQUITY											
Long-Term Debt	15 578	17 920	21 157	21 782	22 354	22 682	22 708	22 277	21 589	20 328	20 570
Current and Other Liabilities	3 415	3 905	3 302	4 063	4 204	3 660	3 239	3 407	3 698	4 216	3 218
Provisions	19	19	19	18	17	16	16	15	14	14	14
Deferred Revenue	444	460	486	515	537	546	556	566	577	588	599
BPIII Reserve Account	196	316	307	236	165	95	24	(0)	(0)	(0)	(0)
Retained Earnings	2 730	2 841	3 087	3 451	3 984	4 718	5 290	5 741	6 261	6 726	7 277
Accumulated Other Comprehensive Income	(761)	(714)	(665)	(616)	(600)	(563)	(525)	(524)	(523)	(523)	(523)
Total Liabilities and Equity before Regulatory Deferral	21 621	24 747	27 694	29 449	30 662	31 154	31 307	31 482	31 617	31 350	31 156
Regulatory Deferral Balance	44	44	44	44	44	44	44	44	44	44	44
	21 665	24 790	27 737	29 493	30 705	31 197	31 350	31 526	31 661	31 394	31 200
Net Debt	15 349	18 248	20 474	21 914	22 650	22 695	22 316	21 765	21 127	20 562	19 913
Total Equity	2 778	3 104	3 469	3 887	4 427	5 170	5 430	5 880	6 414	6 892	7 457
Equity Ratio	15%	15%	14%	15%	16%	19%	20%	21%	23%	25%	27%

ELECTRIC OPERATIONS (MH16)
PROJECTED BALANCE SHEET
MFR77i - 50% of proposed DSM & 50% of expected savings
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
ASSETS									
Plant in Service	33 741	34 487	35 147	35 978	36 754	37 549	38 293	39 095	40 163
Accumulated Depreciation	(6 924)	(7 621)	(8 329)	(9 059)	(9 806)	(10 595)	(11 384)	(12 186)	(12 993)
Net Plant in Service	26 817	26 866	26 817	26 919	26 948	26 955	26 909	26 909	27 170
Construction in Progress	351	313	348	258	232	224	264	319	115
Current and Other Assets	2 732	3 488	2 151	2 142	2 456	2 479	3 476	4 513	5 739
Goodwill and Intangible Assets	967	928	890	852	814	777	740	703	667
Total Assets before Regulatory Deferral	30 867	31 594	30 206	30 171	30 450	30 434	31 389	32 444	33 691
Regulatory Deferral Balance	833	792	753	716	680	646	611	577	542
	31 699	32 386	30 959	30 887	31 130	31 080	32 000	33 021	34 233
LIABILITIES AND EQUITY									
Long-Term Debt	20 523	17 105	13 852	15 273	14 880	14 464	14 518	14 107	13 991
Current and Other Liabilities	3 140	6 531	7 549	5 152	4 760	3 986	3 585	3 618	3 486
Provisions	14	14	14	14	14	14	14	14	14
Deferred Revenue	610	619	629	639	649	660	671	682	694
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	7 892	8 595	9 394	10 288	11 305	12 435	13 691	15 079	16 526
Accumulated Other Comprehensive Income	(523)	(523)	(523)	(523)	(523)	(523)	(523)	(523)	(523)
Total Liabilities and Equity before Regulatory Deferral	31 656	32 342	30 915	30 844	31 086	31 037	31 956	32 977	34 189
Regulatory Deferral Balance	44	44	44	44	44	44	44	44	44
	31 699	32 386	30 959	30 887	31 130	31 080	32 000	33 021	34 233
Net Debt	19 199	18 410	17 511	16 541	15 433	14 212	12 844	11 404	9 909
Total Equity	8 086	8 799	9 605	10 507	11 531	12 671	13 935	15 332	16 790
Equity Ratio	30%	32%	35%	39%	43%	47%	52%	57%	63%

ELECTRIC OPERATIONS (MH16)
PROJECTED CASH FLOW STATEMENT

MFR77i - 50% of proposed DSM & 50% of expected savings

(In Millions of Dollars)

For the year ended March 31	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
OPERATING ACTIVITIES											
Cash Receipts from Customers	2 007	2 131	2 275	2 444	2 733	3 030	3 187	3 275	3 369	3 293	3 369
Cash Paid to Suppliers and Employees	(876)	(917)	(884)	(886)	(911)	(915)	(928)	(944)	(963)	(957)	(971)
Interest Paid	(569)	(529)	(629)	(695)	(734)	(789)	(1 004)	(1 035)	(1 027)	(1 009)	(957)
Interest Received	7	5	12	21	16	17	9	14	22	24	15
	569	689	773	885	1 104	1 344	1 264	1 310	1 401	1 351	1 456
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 743	3 370	3 590	1 970	1 590	790	360	(10)	(10)	(50)	390
Sinking Fund Withdrawals	146	0	0	182	303	767	173	48	328	129	222
Retirement of Long-Term Debt	(1 030)	(330)	(1 002)	(336)	(1 278)	(1 020)	(449)	(290)	(412)	(715)	(1 178)
Other	10	(10)	(10)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 868	3 029	2 578	1 805	604	525	95	(257)	(99)	(641)	(571)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 609)	(3 553)	(2 965)	(2 304)	(1 698)	(1 308)	(847)	(670)	(673)	(699)	(721)
Sinking Fund Payment	(146)	(246)	(210)	(244)	(282)	(334)	(233)	(239)	(244)	(236)	(233)
Other	(68)	(51)	(55)	(44)	(128)	(91)	(84)	(83)	(83)	(80)	(79)
	(2 822)	(3 850)	(3 230)	(2 592)	(2 108)	(1 733)	(1 164)	(992)	(1 000)	(1 015)	(1 033)
Net Increase (Decrease) in Cash	(384)	(131)	121	98	(400)	136	196	61	303	(305)	(148)
Cash at Beginning of Year	944	559	428	549	647	247	382	578	639	942	637
Cash at End of Year	559	428	549	647	247	382	578	639	942	637	489

ELECTRIC OPERATIONS (MH16)
PROJECTED CASH FLOW STATEMENT
MFR77i - 50% of proposed DSM & 50% of expected savings
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 429	3 513	3 611	3 713	3 823	3 938	4 055	4 179	4 216
Cash Paid to Suppliers and Employees	(983)	(998)	(1 016)	(1 041)	(1 064)	(1 088)	(1 118)	(1 148)	(1 163)
Interest Paid	(945)	(937)	(893)	(842)	(787)	(757)	(700)	(673)	(636)
Interest Received	28	50	26	9	13	22	34	59	73
	1 530	1 628	1 729	1 839	1 986	2 114	2 271	2 417	2 490
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	(10)	(20)	1 180	3 380	1 160	340	350	(90)	(30)
Sinking Fund Withdrawals	150	60	431	342	0	30	0	10	275
Retirement of Long-Term Debt	(150)	(50)	(3 450)	(4 386)	(1 982)	(1 566)	(750)	(340)	(265)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(4)	(5)
	(15)	(15)	(1 844)	(669)	(828)	(1 203)	(404)	(424)	(25)
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(730)	(759)	(751)	(791)	(799)	(814)	(826)	(903)	(921)
Sinking Fund Payment	(226)	(227)	(233)	(203)	(187)	(186)	(182)	(184)	(187)
Other	(78)	(72)	(70)	(71)	(70)	(69)	(68)	(66)	(65)
	(1 033)	(1 058)	(1 054)	(1 064)	(1 056)	(1 070)	(1 076)	(1 153)	(1 173)
Net Increase (Decrease) in Cash	481	554	(1 170)	106	102	(158)	791	839	1 292
Cash at Beginning of Year	489	970	1 524	354	460	563	404	1 195	2 035
Cash at End of Year	970	1 524	354	460	563	404	1 195	2 035	3 327

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with 20 Year Debt at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	116	181	247	319	392	469	552	641	735
BPIII Reserve Account	(96)	(151)	3	79	79	79	79	26	-	-	-
Extraprovincial	460	514	469	420	567	693	779	788	805	667	671
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 184	2 263	2 463	2 670	2 826	2 859	2 944	2 909	3 024
EXPENSES											
Operating and Administrative	536	518	501	511	513	524	536	548	559	571	583
Finance Expense	608	590	698	782	874	959	1 216	1 265	1 277	1 276	1 297
Finance Income	(17)	(17)	(21)	(29)	(35)	(34)	(37)	(14)	(14)	(13)	(15)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	739	752
Water Rentals and Assessments	131	130	120	110	113	117	127	128	131	131	131
Fuel and Power Purchased	132	124	140	158	165	156	140	135	138	127	129
Capital and Other Taxes	119	132	145	154	161	165	174	174	175	175	175
Other Expenses	60	116	109	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 998	2 171	2 692	2 449	2 584	2 925	3 022	3 067	3 085	3 136
Net Income before Net Movement in Reg. Deferral	(46)	10	13	(429)	14	86	(99)	(163)	(123)	(175)	(112)
Net Movement in Regulatory Deferral	66	72	114	464	71	64	43	(48)	(50)	(49)	(45)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	82	127	36	85	149	(56)	(211)	(172)	(224)	(157)
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	90	128	33	80	141	(66)	(222)	(176)	(226)	(160)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**90**	**128**	**33**	**80**	**141**	**(66)**	**(222)**	**(176)**	**(226)**	**(160)**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	82	127	36	85	149	(56)	(211)	(172)	(224)	(157)
* Additional Domestic Revenue											
Percent Increase		3.36%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%
Cumulative Percent Increase		3.36%	7.44%	11.69%	16.10%	20.68%	25.45%	30.41%	35.56%	40.91%	46.48%
Financial Ratios											
Equity	16%	15%	14%	13%	13%	13%	12%	12%	11%	10%	10%
EBITDA Interest Coverage	1.51	1.53	1.61	1.54	1.58	1.64	1.54	1.47	1.52	1.49	1.54
Capital Coverage	1.53	1.39	1.33	1.15	1.36	1.59	1.30	1.21	1.20	1.10	1.18

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with 20 Year Debt at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	835	940	1 001	1 065	1 137	1 213	1 291	1 374	1 460
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	662	677	697	709	705	701	696	694	602
Other	36	37	38	38	39	40	40	40	41
	3 133	3 269	3 366	3 460	3 555	3 654	3 756	3 865	3 889
EXPENSES									
Operating and Administrative	595	607	620	633	646	660	674	688	702
Finance Expense	1 305	1 307	1 293	1 265	1 226	1 212	1 192	1 170	1 130
Finance Income	(14)	(19)	(21)	(18)	(20)	(24)	(30)	(37)	(30)
Depreciation and Amortization	765	776	790	805	822	840	856	872	888
Water Rentals and Assessments	132	132	132	133	133	133	134	134	134
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	176	177	178	179	180	181	182	183	189
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	6	4	4	4	4	4	4
	3 176	3 206	3 223	3 235	3 209	3 225	3 239	3 252	3 247
Net Income before Net Movement in Reg. Deferral	(43)	63	143	225	346	429	517	613	642
Net Movement in Regulatory Deferral	(44)	(40)	(35)	(33)	(31)	(28)	(28)	(28)	(30)
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	(87)	23	108	192	315	401	489	585	612
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	(91)	17	100	182	303	388	474	569	596
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**(91)**	**17**	**100**	**182**	**303**	**388**	**474**	**569**	**596**
Non-controlling Interest	4	6	8	10	11	13	14	16	16
	(87)	23	108	192	315	401	489	585	612
* Additional Domestic Revenue									
Percent Increase	3.95%	3.95%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Percent Increase	52.26%	58.28%	61.44%	64.67%	67.97%	71.33%	74.75%	78.25%	81.81%
Financial Ratios									
Equity	10%	10%	10%	11%	12%	14%	15%	18%	20%
EBITDA Interest Coverage	1.60	1.69	1.78	1.87	2.01	2.11	2.22	2.35	2.43
Capital Coverage	1.30	1.42	1.57	1.61	1.80	1.90	2.01	1.96	1.97

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim with 20 Year Debt at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 166	30 501	31 031	31 667	32 331	32 942
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 705)	(4 328)	(4 942)	(5 607)	(6 212)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 042	26 796	26 703	26 724	26 725	26 730
Construction in Progress	7 079	9 471	6 745	7 523	8 012	3 837	370	457	421	417	414
Current and Other Assets	1 773	1 913	2 186	2 447	2 655	1 845	1 590	1 577	1 521	1 872	1 690
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 304	27 045	28 402	30 147	30 025	30 011	29 948	29 833	30 137	29 915
Regulatory Deferral Balance	462	533	647	1 111	1 182	1 246	1 289	1 241	1 192	1 143	1 098
	21 733	24 837	27 692	29 513	31 329	31 272	31 300	31 189	31 025	31 280	31 013
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 389	23 594	23 639	24 864	24 740	24 452	24 391	25 233
Current and Other Liabilities	3 204	3 644	3 052	3 823	4 369	4 158	3 040	3 199	3 488	4 019	3 061
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	344	265	185	106	26	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 839	2 967	3 000	3 080	3 221	3 155	2 933	2 757	2 531	2 371
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(496)	(439)	(344)	(343)	(343)	(343)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 788	27 643	29 465	31 281	31 223	31 251	31 140	30 976	31 231	30 964
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 837	27 692	29 513	31 329	31 272	31 300	31 189	31 025	31 280	31 013
Net Debt	15 427	18 474	20 825	22 657	23 809	24 496	24 761	24 811	24 877	24 994	25 060
Total Equity	2 856	3 160	3 424	3 511	3 617	3 763	3 390	3 258	3 098	2 885	2 739
Equity Ratio	16%	15%	14%	13%	13%	13%	12%	12%	11%	10%	10%

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim with 20 Year Debt at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
ASSETS									
Plant in Service	33 550	34 296	34 956	35 787	36 563	37 358	38 102	38 904	39 972
Accumulated Depreciation	(6 906)	(7 602)	(8 311)	(9 040)	(9 788)	(10 576)	(11 365)	(12 168)	(12 975)
Net Plant in Service	26 644	26 693	26 645	26 747	26 776	26 782	26 737	26 737	26 997
Construction in Progress	495	457	493	403	377	369	409	464	260
Current and Other Assets	1 946	2 422	2 786	2 257	2 858	3 315	3 909	4 510	4 878
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	30 126	30 573	30 886	30 330	30 895	31 314	31 865	32 483	32 871
Regulatory Deferral Balance	1 055	1 014	980	947	916	888	860	832	802
	31 180	31 588	31 866	31 277	31 811	32 202	32 725	33 315	33 673
LIABILITIES AND EQUITY									
Long-Term Debt	25 565	25 908	25 295	25 265	25 489	25 452	25 456	25 095	24 979
Current and Other Liabilities	2 976	3 015	3 797	3 047	3 045	3 075	3 109	3 482	3 349
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	2 280	2 297	2 398	2 580	2 883	3 271	3 745	4 314	4 910
Accumulated Other Comprehensive Income	(343)	(343)	(343)	(343)	(343)	(343)	(343)	(343)	(343)
Total Liabilities and Equity before Regulatory Deferral	31 132	31 539	31 817	31 228	31 763	32 153	32 676	33 266	33 624
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	31 180	31 588	31 866	31 277	31 811	32 202	32 725	33 315	33 673
Net Debt	25 043	24 932	24 726	24 468	24 071	23 591	23 014	22 399	21 762
Total Equity	2 663	2 686	2 794	2 984	3 295	3 692	4 174	4 753	5 358
Equity Ratio	10%	10%	10%	11%	12%	14%	15%	18%	20%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with 20 Year Debt at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 170	2 173	2 371	2 577	2 734	2 821	2 931	2 897	3 011
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(870)	(885)	(894)	(903)	(935)	(953)	(952)	(966)
Interest Paid	(553)	(532)	(652)	(734)	(814)	(909)	(1 161)	(1 233)	(1 246)	(1 246)	(1 274)
Interest Received	17	5	12	22	26	19	7	6	7	6	8
	810	733	686	592	698	794	676	658	740	704	780
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 360	2 590	1 180	1 570	390	390	1 150	990
Sinking Fund Withdrawals	146	0	0	120	318	813	182	54	350	156	254
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(248)	(261)	(271)	(267)	(275)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(10)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 861	1 308	263	374	(112)	52	318	(214)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 659)	(3 002)	(2 391)	(1 760)	(1 368)	(898)	(700)	(704)	(732)	(756)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 748)	(3 059)	(2 438)	(1 850)	(1 477)	(997)	(796)	(800)	(814)	(838)
Net Increase (Decrease) in Cash	(309)	(147)	(7)	14	156	(420)	53	(249)	(7)	208	(272)
Cash at Beginning of Year	943	634	487	480	494	650	230	283	34	27	235
Cash at End of Year	634	487	480	494	650	230	283	34	27	235	(37)

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with 20 Year Debt at MH15 Rates
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 120	3 255	3 352	3 446	3 540	3 640	3 741	3 851	3 874
Cash Paid to Suppliers and Employees	(980)	(995)	(1 012)	(1 035)	(1 030)	(1 043)	(1 063)	(1 087)	(1 096)
Interest Paid	(1 282)	(1 298)	(1 300)	(1 288)	(1 216)	(1 220)	(1 213)	(1 206)	(1 178)
Interest Received	14	29	39	48	25	41	60	81	79
	872	990	1 079	1 171	1 319	1 418	1 524	1 639	1 680
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	390	390	210	(20)	190	(50)	(30)	(60)	(20)
Sinking Fund Withdrawals	150	60	110	796	13	30	0	10	275
Sinking Fund Payment	(275)	(283)	(291)	(300)	(275)	(287)	(297)	(309)	(321)
Retirement of Long-Term Debt	(150)	(60)	(80)	(796)	(13)	0	20	20	(275)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(5)	(5)
	110	102	(57)	(325)	(90)	(314)	(311)	(343)	(345)
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(767)	(798)	(793)	(832)	(840)	(857)	(870)	(948)	(966)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(847)	(873)	(864)	(905)	(913)	(928)	(940)	(1 016)	(1 033)
Net Increase (Decrease) in Cash	134	219	158	(59)	316	176	274	280	301
Cash at Beginning of Year	(37)	97	317	475	416	732	908	1 182	1 462
Cash at End of Year	97	317	475	416	732	908	1 182	1 462	1 763

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim and 20 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	179	315	458	619	789	973	1 094	1 158	1 224
BPIII Reserve Account	(96)	(151)	1	80	80	80	80	27	-	-	-
Extraprovincial	460	514	469	420	567	693	779	788	805	667	671
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 246	2 398	2 674	2 970	3 223	3 364	3 487	3 426	3 513
EXPENSES											
Operating and Administrative	536	518	501	511	513	524	536	548	559	571	583
Finance Expense	608	590	700	783	870	944	1 187	1 214	1 192	1 165	1 138
Finance Income	(17)	(17)	(21)	(29)	(35)	(34)	(38)	(16)	(19)	(21)	(18)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	740	752
Water Rentals and Assessments	131	130	120	110	113	117	127	128	131	131	131
Fuel and Power Purchased	132	124	140	158	165	156	141	135	138	127	129
Capital and Other Taxes	119	132	145	154	161	165	174	175	175	175	175
Other Expenses	60	116	109	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 999	2 173	2 693	2 445	2 569	2 895	2 969	2 977	2 967	2 975
Net Income before Net Movement in Reg. Deferral	(46)	10	72	(295)	230	400	328	394	510	460	539
Net Movement in Regulatory Deferral	66	72	114	464	71	64	43	(48)	(50)	(49)	(45)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	81	186	169	301	464	370	347	460	411	494
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	90	187	167	296	456	361	335	457	409	491
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**90**	**187**	**167**	**296**	**456**	**361**	**335**	**457**	**409**	**491**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	81	186	169	301	464	370	347	460	411	494
* Additional Domestic Revenue											
Percent Increase		3.36%	7.90%	7.90%	7.90%	7.90%	7.90%	7.90%	4.54%	2.00%	2.00%
Cumulative Percent Increase		3.36%	11.53%	20.34%	29.84%	40.10%	51.17%	63.11%	70.52%	73.93%	77.40%
Financial Ratios											
Equity	16%	15%	14%	14%	15%	16%	16%	18%	19%	21%	23%
EBITDA Interest Coverage	1.51	1.53	1.67	1.66	1.76	1.91	1.91	1.95	2.08	2.08	2.19
Capital Coverage	1.53	1.39	1.45	1.41	1.79	2.22	2.11	2.23	2.22	2.07	2.17

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim and 20 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	1 294	1 364	1 438	1 515	1 603	1 696	1 793	1 894	1 999
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	662	677	697	709	705	701	696	694	602
Other	36	37	38	38	39	40	40	40	41
	3 591	3 693	3 803	3 910	4 021	4 138	4 257	4 385	4 428
EXPENSES									
Operating and Administrative	595	607	620	633	646	660	674	688	702
Finance Expense	1 122	1 103	1 085	1 059	1 015	1 000	983	963	926
Finance Income	(23)	(38)	(58)	(77)	(98)	(126)	(158)	(192)	(214)
Depreciation and Amortization	765	776	791	805	822	840	857	872	888
Water Rentals and Assessments	132	132	132	133	133	133	134	134	134
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	176	177	179	180	181	183	184	185	192
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	6	4	4	4	4	4	4
	2 984	2 983	2 979	2 971	2 922	2 914	2 904	2 892	2 862
Net Income before Net Movement in Reg. Deferral	608	710	824	939	1 099	1 224	1 353	1 493	1 566
Net Movement in Regulatory Deferral	(44)	(40)	(35)	(33)	(31)	(28)	(28)	(28)	(30)
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	564	670	790	906	1 069	1 196	1 325	1 465	1 536
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	560	664	782	896	1 057	1 183	1 310	1 449	1 519
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**560**	**664**	**782**	**896**	**1 057**	**1 183**	**1 310**	**1 449**	**1 519**
Non-controlling Interest	4	6	8	10	12	13	15	16	17
	564	670	790	906	1 069	1 196	1 325	1 465	1 536
* Additional Domestic Revenue									
Percent Increase	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Percent Increase	80.95%	84.57%	88.26%	92.03%	95.87%	99.79%	103.78%	107.86%	112.01%
Financial Ratios									
Equity	25%	27%	30%	34%	38%	42%	47%	53%	58%
EBITDA Interest Coverage	2.28	2.43	2.61	2.81	3.13	3.39	3.70	4.07	4.43
Capital Coverage	2.26	2.34	2.56	2.59	2.82	2.96	3.11	3.02	3.06

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim and 20 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 175	30 517	31 047	31 683	32 347	32 958
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 706)	(4 328)	(4 943)	(5 607)	(6 213)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 051	26 812	26 718	26 740	26 740	26 745
Construction in Progress	7 079	9 472	6 747	7 528	8 023	3 844	370	457	421	417	414
Current and Other Assets	1 773	1 913	2 245	2 437	2 658	1 958	1 725	1 865	2 028	1 810	2 040
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 304	27 106	28 397	30 160	30 153	30 162	30 252	30 356	30 090	30 280
Regulatory Deferral Balance	462	533	647	1 111	1 182	1 246	1 289	1 241	1 192	1 143	1 098
	21 733	24 837	27 753	29 509	31 342	31 399	31 451	31 493	31 547	31 233	31 378
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 189	23 194	23 039	23 871	23 366	22 668	21 417	22 059
Current and Other Liabilities	3 204	3 645	3 052	3 825	4 373	4 162	3 042	3 196	3 481	3 998	3 000
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	346	266	186	106	27	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 839	3 026	3 192	3 488	3 944	4 304	4 640	5 097	5 505	5 996
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(496)	(446)	(371)	(370)	(369)	(369)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 789	27 704	29 460	31 293	31 350	31 402	31 444	31 499	31 184	31 329
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 837	27 753	29 509	31 342	31 399	31 451	31 493	31 547	31 233	31 378
Net Debt	15 427	18 474	20 766	22 468	23 408	23 784	23 632	23 149	22 587	22 083	21 500
Total Equity	2 856	3 160	3 485	3 705	4 026	4 487	4 533	4 939	5 411	5 833	6 338
Equity Ratio	16%	15%	14%	14%	15%	16%	16%	18%	19%	21%	23%

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim and 20 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
ASSETS									
Plant in Service	33 566	34 312	34 972	35 803	36 579	37 374	38 118	38 920	39 988
Accumulated Depreciation	(6 907)	(7 604)	(8 312)	(9 042)	(9 790)	(10 579)	(11 368)	(12 171)	(12 978)
Net Plant in Service	26 659	26 708	26 659	26 761	26 789	26 796	26 750	26 750	27 010
Construction in Progress	495	457	493	403	377	369	409	464	260
Current and Other Assets	2 577	3 291	4 327	4 523	5 664	6 927	8 347	9 838	11 120
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	30 771	31 457	32 441	32 610	33 715	34 939	36 316	37 824	39 126
Regulatory Deferral Balance	1 055	1 014	980	947	916	888	860	832	802
	31 826	32 472	33 421	33 557	34 631	35 827	37 176	38 656	39 928
LIABILITIES AND EQUITY									
Long-Term Debt	21 992	21 934	21 311	21 292	21 305	21 279	21 272	20 921	20 796
Current and Other Liabilities	2 946	2 976	3 758	3 008	3 003	3 032	3 067	3 439	3 307
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	6 556	7 220	8 002	8 898	9 955	11 138	12 449	13 897	15 417
Accumulated Other Comprehensive Income	(369)	(369)	(369)	(369)	(369)	(369)	(369)	(369)	(369)
Total Liabilities and Equity before Regulatory Deferral	31 777	32 423	33 372	33 508	34 582	35 778	37 127	38 607	39 879
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	31 826	32 472	33 421	33 557	34 631	35 827	37 176	38 656	39 928
Net Debt	20 839	20 090	19 202	18 229	17 082	15 806	14 393	12 898	11 336
Total Equity	6 913	7 582	8 372	9 276	10 341	11 533	12 852	14 310	15 839
Equity Ratio	25%	27%	30%	34%	38%	42%	47%	53%	58%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim and 20 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 233	2 307	2 582	2 877	3 130	3 325	3 474	3 414	3 500
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(870)	(885)	(894)	(904)	(935)	(953)	(952)	(966)
Interest Paid	(553)	(532)	(655)	(734)	(808)	(894)	(1 134)	(1 186)	(1 165)	(1 150)	(1 117)
Interest Received	17	5	11	23	26	20	7	8	13	13	11
	810	733	747	725	915	1 109	1 100	1 211	1 369	1 324	1 429
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 160	2 390	980	1 170	(10)	(20)	(40)	790
Sinking Fund Withdrawals	146	0	0	120	318	813	182	48	340	140	234
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(242)	(251)	(255)	(247)	(244)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(11)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 661	1 108	62	(20)	(507)	(352)	(867)	(403)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 660)	(3 004)	(2 395)	(1 765)	(1 373)	(898)	(700)	(704)	(732)	(756)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 749)	(3 061)	(2 441)	(1 855)	(1 481)	(997)	(796)	(800)	(814)	(838)
Net Increase (Decrease) in Cash	(309)	(147)	52	(55)	169	(310)	83	(92)	217	(357)	188
Cash at Beginning of Year	943	634	487	539	483	652	342	424	332	550	193
Cash at End of Year	634	487	539	483	652	342	424	332	550	193	380

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim and 20 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 578	3 679	3 789	3 896	4 007	4 123	4 243	4 370	4 413
Cash Paid to Suppliers and Employees	(980)	(996)	(1 013)	(1 036)	(1 031)	(1 045)	(1 065)	(1 088)	(1 099)
Interest Paid	(1 104)	(1 100)	(1 088)	(1 075)	(1 002)	(999)	(993)	(986)	(959)
Interest Received	22	46	72	100	95	134	177	223	248
	1 516	1 629	1 761	1 886	2 069	2 214	2 361	2 519	2 604
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	(10)	(10)	200	(10)	(20)	(40)	(40)	(50)	(30)
Sinking Fund Withdrawals	150	60	110	776	0	30	0	10	275
Sinking Fund Payment	(241)	(243)	(250)	(257)	(228)	(237)	(245)	(255)	(264)
Retirement of Long-Term Debt	(150)	(60)	(80)	(796)	(13)	0	20	20	(275)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(5)	(5)
	(256)	(258)	(25)	(292)	(266)	(254)	(269)	(279)	(299)
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(767)	(798)	(793)	(832)	(840)	(857)	(870)	(948)	(966)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(847)	(873)	(864)	(905)	(913)	(928)	(940)	(1 016)	(1 033)
Net Increase (Decrease) in Cash	412	498	871	689	890	1 032	1 152	1 224	1 271
Cash at Beginning of Year	380	793	1 291	2 162	2 851	3 741	4 773	5 926	7 150
Cash at End of Year	793	1 291	2 162	2 851	3 741	4 773	5 926	7 150	8 421

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim and 12 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	179	315	458	619	789	973	1 094	1 158	1 224
BPIII Reserve Account	(96)	(151)	1	80	80	80	80	27	-	-	-
Extraprovincial	460	514	469	420	567	693	779	788	805	667	671
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 246	2 398	2 674	2 970	3 223	3 364	3 487	3 426	3 513
EXPENSES											
Operating and Administrative	536	518	501	511	513	524	536	548	559	571	583
Finance Expense	608	589	690	767	848	917	1 158	1 187	1 165	1 139	1 103
Finance Income	(17)	(17)	(21)	(29)	(35)	(33)	(39)	(19)	(24)	(26)	(19)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	740	752
Water Rentals and Assessments	131	130	120	110	113	117	127	128	131	131	131
Fuel and Power Purchased	132	124	140	158	165	156	141	135	138	127	129
Capital and Other Taxes	119	132	145	154	161	165	174	175	175	175	175
Other Expenses	60	116	109	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 997	2 163	2 677	2 423	2 543	2 865	2 939	2 946	2 935	2 938
Net Income before Net Movement in Reg. Deferral	(46)	11	82	(279)	252	427	357	424	541	492	575
Net Movement in Regulatory Deferral	66	72	114	464	71	64	43	(48)	(50)	(49)	(45)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	83	196	185	323	491	400	377	491	443	530
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	91	197	183	318	482	390	365	488	441	527
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**91**	**197**	**183**	**318**	**482**	**390**	**365**	**488**	**441**	**527**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	83	196	185	323	491	400	377	491	443	530
* Additional Domestic Revenue											
Percent Increase		3.36%	7.90%	7.90%	7.90%	7.90%	7.90%	7.90%	4.54%	2.00%	2.00%
Cumulative Percent Increase		3.36%	11.53%	20.34%	29.84%	40.10%	51.17%	63.11%	70.52%	73.93%	77.40%
Financial Ratios											
Equity	16%	15%	14%	14%	15%	16%	16%	18%	20%	22%	24%
EBITDA Interest Coverage	1.51	1.53	1.68	1.69	1.79	1.95	1.95	2.00	2.14	2.14	2.26
Capital Coverage	1.53	1.40	1.46	1.43	1.83	2.27	2.17	2.28	2.27	2.12	2.22

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim and 12 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	1 294	1 364	1 438	1 515	1 603	1 696	1 793	1 894	1 999
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	662	677	697	709	705	701	696	694	602
Other	36	37	38	38	39	40	40	40	41
	3 591	3 693	3 803	3 910	4 021	4 138	4 257	4 385	4 428
EXPENSES									
Operating and Administrative	595	607	620	633	646	660	674	688	702
Finance Expense	1 083	1 065	1 034	955	889	834	781	695	632
Finance Income	(25)	(41)	(47)	(18)	(18)	(20)	(28)	(25)	(40)
Depreciation and Amortization	765	776	791	805	822	840	857	872	888
Water Rentals and Assessments	132	132	132	133	133	133	134	134	134
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	177	177	178	179	180	181	182	183	190
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	5	3	3	3	3	3	3
	2 944	2 942	2 937	2 924	2 873	2 851	2 828	2 789	2 739
Net Income before Net Movement in Reg. Deferral	648	750	866	986	1 148	1 286	1 429	1 596	1 689
Net Movement in Regulatory Deferral	(44)	(40)	(35)	(33)	(31)	(28)	(28)	(28)	(30)
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	604	710	831	953	1 118	1 259	1 401	1 568	1 659
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	600	705	823	943	1 106	1 246	1 387	1 552	1 643
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**600**	**705**	**823**	**943**	**1 106**	**1 246**	**1 387**	**1 552**	**1 643**
Non-controlling Interest	4	6	8	10	11	13	14	16	16
	604	710	831	953	1 118	1 259	1 401	1 568	1 659
* Additional Domestic Revenue									
Percent Increase	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Percent Increase	80.95%	84.57%	88.26%	92.03%	95.87%	99.79%	103.78%	107.86%	112.01%
Financial Ratios									
Equity	26%	29%	32%	35%	39%	44%	49%	55%	61%
EBITDA Interest Coverage	2.37	2.52	2.71	2.94	3.30	3.64	4.06	4.67	5.30
Capital Coverage	2.32	2.39	2.61	2.65	2.87	3.04	3.20	3.12	3.20

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim and 12 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 175	30 517	31 047	31 683	32 347	32 958
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 706)	(4 328)	(4 943)	(5 607)	(6 213)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 051	26 812	26 718	26 740	26 740	26 745
Construction in Progress	7 079	9 472	6 747	7 528	8 023	3 844	370	457	421	417	414
Current and Other Assets	1 773	1 914	2 255	2 461	2 501	1 828	1 827	1 997	2 201	2 004	2 068
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 305	27 115	28 421	30 004	30 024	30 263	30 383	30 528	30 284	30 308
Regulatory Deferral Balance	462	533	647	1 111	1 182	1 246	1 289	1 241	1 192	1 143	1 098
	21 733	24 838	27 762	29 533	31 186	31 270	31 552	31 624	31 720	31 427	31 406
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 189	22 994	22 840	23 874	23 366	22 678	21 417	21 859
Current and Other Liabilities	3 204	3 644	3 050	3 822	4 368	4 156	3 037	3 191	3 476	3 993	2 993
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	346	266	186	106	27	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 840	3 037	3 220	3 538	4 020	4 410	4 776	5 263	5 704	6 231
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(497)	(449)	(370)	(369)	(368)	(368)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 789	27 714	29 484	31 137	31 221	31 503	31 576	31 671	31 378	31 357
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 838	27 762	29 533	31 186	31 270	31 552	31 624	31 720	31 427	31 406
Net Debt	15 427	18 474	20 757	22 444	23 364	23 715	23 534	23 017	22 424	21 889	21 271
Total Equity	2 856	3 161	3 496	3 732	4 075	4 562	4 636	5 075	5 578	6 032	6 574
Equity Ratio	16%	15%	14%	14%	15%	16%	16%	18%	20%	22%	24%

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim and 12 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
ASSETS									
Plant in Service	33 566	34 312	34 972	35 803	36 579	37 374	38 118	38 920	39 988
Accumulated Depreciation	(6 907)	(7 604)	(8 312)	(9 042)	(9 790)	(10 579)	(11 368)	(12 171)	(12 978)
Net Plant in Service	26 659	26 708	26 659	26 761	26 789	26 796	26 750	26 750	27 010
Construction in Progress	495	457	493	403	377	369	409	464	260
Current and Other Assets	2 645	3 400	2 279	2 106	2 299	2 813	3 379	3 596	5 011
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	30 839	31 566	30 393	30 194	30 350	30 825	31 348	31 582	33 017
Regulatory Deferral Balance	1 055	1 014	980	947	916	888	860	832	802
	31 894	32 580	31 373	31 141	31 266	31 713	32 208	32 413	33 819
LIABILITIES AND EQUITY									
Long-Term Debt	21 791	19 414	15 321	16 371	15 335	15 780	14 450	14 049	13 933
Current and Other Liabilities	2 938	5 289	7 342	5 108	5 154	3 901	4 329	3 373	3 241
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	6 831	7 536	8 359	9 302	10 408	11 654	13 041	14 592	16 235
Accumulated Other Comprehensive Income	(368)	(368)	(368)	(368)	(368)	(368)	(368)	(368)	(368)
Total Liabilities and Equity before Regulatory Deferral	31 845	32 532	31 324	31 092	31 218	31 664	32 159	32 365	33 770
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	31 894	32 580	31 373	31 141	31 266	31 713	32 208	32 413	33 819
Net Debt	20 570	19 781	18 860	17 845	16 657	15 321	13 833	12 249	10 564
Total Equity	7 188	7 899	8 730	9 680	10 795	12 049	13 444	15 005	16 658
Equity Ratio	26%	29%	32%	35%	39%	44%	49%	55%	61%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim and 12 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 233	2 307	2 582	2 877	3 130	3 325	3 474	3 414	3 500
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(870)	(885)	(894)	(904)	(935)	(953)	(952)	(966)
Interest Paid	(553)	(531)	(646)	(719)	(789)	(867)	(1 104)	(1 159)	(1 138)	(1 124)	(1 085)
Interest Received	17	5	11	23	26	19	8	11	17	19	12
	810	734	756	740	935	1 135	1 131	1 241	1 400	1 356	1 462
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 160	2 190	980	1 370	(10)	(10)	(50)	590
Sinking Fund Withdrawals	146	0	0	120	318	813	182	46	339	140	234
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(240)	(251)	(255)	(247)	(244)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(11)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 661	908	62	182	(509)	(342)	(877)	(603)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 660)	(3 004)	(2 395)	(1 765)	(1 373)	(898)	(700)	(704)	(732)	(756)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 749)	(3 061)	(2 441)	(1 855)	(1 481)	(997)	(796)	(800)	(814)	(838)
Net Increase (Decrease) in Cash	(309)	(146)	60	(40)	(12)	(284)	316	(64)	258	(335)	21
Cash at Beginning of Year	943	634	487	548	507	496	212	528	464	722	387
Cash at End of Year	634	487	548	507	496	212	528	464	722	387	408

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim and 12 Year WATM with Flattened Yield Curve
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 578	3 679	3 789	3 896	4 007	4 123	4 243	4 370	4 413
Cash Paid to Suppliers and Employees	(980)	(996)	(1 012)	(1 035)	(1 030)	(1 043)	(1 063)	(1 087)	(1 097)
Interest Paid	(1 065)	(1 061)	(1 039)	(955)	(881)	(831)	(777)	(713)	(643)
Interest Received	22	47	56	22	14	25	32	38	53
	1 556	1 670	1 793	1 928	2 110	2 274	2 435	2 608	2 727
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	(10)	(10)	370	3 180	1 150	1 340	(50)	(90)	(30)
Sinking Fund Withdrawals	150	60	310	538	0	230	0	10	188
Sinking Fund Payment	(239)	(241)	(248)	(225)	(200)	(198)	(188)	(186)	(180)
Retirement of Long-Term Debt	(150)	(60)	(2 440)	(4 396)	(2 173)	(2 190)	(898)	(1 304)	(265)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(4)	(5)
	(254)	(256)	(2 013)	(908)	(1 228)	(825)	(1 141)	(1 575)	(291)
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(767)	(798)	(793)	(832)	(840)	(857)	(870)	(948)	(966)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(847)	(873)	(864)	(905)	(913)	(928)	(940)	(1 016)	(1 033)
Net Increase (Decrease) in Cash	455	541	(1 084)	115	(31)	521	355	18	1 402
Cash at Beginning of Year	408	863	1 404	320	435	404	925	1 280	1 298
Cash at End of Year	863	1 404	320	435	404	925	1 280	1 298	2 700

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with 20 Year Debt with 3.95% Until 25% Equity
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	116	181	247	319	392	469	552	641	735
BPIII Reserve Account	(96)	(151)	3	79	79	79	79	26	-	-	-
Extraprovincial	460	514	469	420	567	693	779	788	805	667	671
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 184	2 263	2 463	2 670	2 826	2 859	2 944	2 909	3 024
EXPENSES											
Operating and Administrative	536	518	501	511	513	524	536	548	559	571	583
Finance Expense	608	590	698	782	874	959	1 216	1 265	1 277	1 276	1 297
Finance Income	(17)	(17)	(21)	(29)	(35)	(34)	(37)	(14)	(14)	(13)	(15)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	739	752
Water Rentals and Assessments	131	130	120	110	113	117	127	128	131	131	131
Fuel and Power Purchased	132	124	140	158	165	156	140	135	138	127	129
Capital and Other Taxes	119	132	145	154	161	165	174	174	175	175	175
Other Expenses	60	116	109	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 998	2 171	2 692	2 449	2 584	2 925	3 022	3 067	3 085	3 136
Net Income before Net Movement in Reg. Deferral	(46)	10	13	(429)	14	86	(99)	(163)	(123)	(175)	(112)
Net Movement in Regulatory Deferral	66	72	114	464	71	64	43	(48)	(50)	(49)	(45)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	82	127	36	85	149	(56)	(211)	(172)	(224)	(157)
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	90	128	33	80	141	(66)	(222)	(176)	(226)	(160)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**90**	**128**	**33**	**80**	**141**	**(66)**	**(222)**	**(176)**	**(226)**	**(160)**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	82	127	36	85	149	(56)	(211)	(172)	(224)	(157)
* Additional Domestic Revenue											
Percent Increase		3.36%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%
Cumulative Percent Increase		3.36%	7.44%	11.69%	16.10%	20.68%	25.45%	30.41%	35.56%	40.91%	46.48%
Financial Ratios											
Equity	16%	15%	14%	13%	13%	13%	12%	12%	11%	10%	10%
EBITDA Interest Coverage	1.51	1.53	1.61	1.54	1.58	1.64	1.54	1.47	1.52	1.49	1.54
Capital Coverage	1.53	1.39	1.33	1.15	1.36	1.59	1.30	1.21	1.20	1.10	1.18

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with 20 Year Debt with 3.95% Until 25% Equity
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	835	940	1 052	1 169	1 301	1 442	1 591	1 751	1 920
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	662	677	697	709	705	701	696	694	602
Other	36	37	38	38	39	40	40	40	41
	3 133	3 269	3 416	3 564	3 719	3 883	4 056	4 241	4 349
EXPENSES									
Operating and Administrative	595	607	620	633	646	660	674	688	702
Finance Expense	1 305	1 307	1 293	1 265	1 218	1 201	1 181	1 159	1 119
Finance Income	(14)	(19)	(22)	(21)	(22)	(31)	(45)	(64)	(70)
Depreciation and Amortization	765	776	790	805	822	840	856	872	888
Water Rentals and Assessments	132	132	132	133	133	133	134	134	134
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	176	177	178	179	180	181	183	184	190
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	6	4	4	4	4	4	4
	3 176	3 206	3 223	3 232	3 199	3 207	3 213	3 214	3 197
Net Income before Net Movement in Reg. Deferral	(43)	63	194	332	520	676	843	1 027	1 152
Net Movement in Regulatory Deferral	(44)	(40)	(35)	(33)	(31)	(28)	(28)	(28)	(30)
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	(87)	23	159	299	489	648	815	999	1 122
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	(91)	17	151	289	477	635	800	983	1 106
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**(91)**	**17**	**151**	**289**	**477**	**635**	**800**	**983**	**1 106**
Non-controlling Interest	4	6	8	10	11	13	14	16	16
	(87)	23	159	299	489	648	815	999	1 122
* Additional Domestic Revenue									
Percent Increase	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%
Cumulative Percent Increase	52.26%	58.28%	64.53%	71.03%	77.79%	84.81%	92.11%	99.70%	107.58%
Financial Ratios									
Equity	10%	10%	10%	11%	13%	16%	19%	22%	27%
EBITDA Interest Coverage	1.60	1.69	1.82	1.95	2.16	2.34	2.53	2.76	2.97
Capital Coverage	1.30	1.42	1.64	1.76	2.03	2.23	2.44	2.46	2.57

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim with 20 Year Debt with 3.95% Until 25% Equity
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 166	30 501	31 031	31 667	32 331	32 942
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 705)	(4 328)	(4 942)	(5 607)	(6 212)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 042	26 796	26 703	26 724	26 725	26 730
Construction in Progress	7 079	9 471	6 745	7 523	8 012	3 837	370	457	421	417	414
Current and Other Assets	1 773	1 913	2 186	2 447	2 655	1 845	1 590	1 577	1 521	1 872	1 690
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 304	27 045	28 402	30 147	30 025	30 011	29 948	29 833	30 137	29 915
Regulatory Deferral Balance	462	533	647	1 111	1 182	1 246	1 289	1 241	1 192	1 143	1 098
	21 733	24 837	27 692	29 513	31 329	31 272	31 300	31 189	31 025	31 280	31 013
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 389	23 594	23 639	24 864	24 740	24 452	24 391	25 233
Current and Other Liabilities	3 204	3 644	3 052	3 823	4 369	4 158	3 040	3 199	3 488	4 019	3 061
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	344	265	185	106	26	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 839	2 967	3 000	3 080	3 221	3 155	2 933	2 757	2 531	2 371
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(496)	(439)	(344)	(343)	(343)	(343)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 788	27 643	29 465	31 281	31 223	31 251	31 140	30 976	31 231	30 964
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 837	27 692	29 513	31 329	31 272	31 300	31 189	31 025	31 280	31 013
Net Debt	15 427	18 474	20 825	22 657	23 809	24 496	24 761	24 811	24 877	24 994	25 060
Total Equity	2 856	3 160	3 424	3 511	3 617	3 763	3 390	3 258	3 098	2 885	2 739
Equity Ratio	16%	15%	14%	13%	13%	13%	12%	12%	11%	10%	10%

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim with 20 Year Debt with 3.95% Until 25% Equity
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
ASSETS									
Plant in Service	33 550	34 296	34 956	35 787	36 563	37 358	38 102	38 904	39 972
Accumulated Depreciation	(6 906)	(7 602)	(8 311)	(9 040)	(9 788)	(10 576)	(11 365)	(12 168)	(12 975)
Net Plant in Service	26 644	26 693	26 645	26 747	26 776	26 782	26 737	26 737	26 997
Construction in Progress	495	457	493	403	377	369	409	464	260
Current and Other Assets	1 946	2 422	2 837	2 415	2 986	3 691	4 612	5 626	6 505
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	30 126	30 573	30 937	30 489	31 024	31 690	32 567	33 599	34 498
Regulatory Deferral Balance	1 055	1 014	980	947	916	888	860	832	802
	31 180	31 588	31 917	31 436	31 940	32 578	33 427	34 431	35 299
LIABILITIES AND EQUITY									
Long-Term Debt	25 565	25 908	25 295	25 265	25 289	25 252	25 256	24 895	24 779
Current and Other Liabilities	2 976	3 015	3 797	3 047	3 041	3 071	3 106	3 478	3 345
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	2 280	2 297	2 449	2 738	3 215	3 851	4 651	5 634	6 740
Accumulated Other Comprehensive Income	(343)	(343)	(343)	(343)	(343)	(343)	(343)	(343)	(343)
Total Liabilities and Equity before Regulatory Deferral	31 132	31 539	31 868	31 387	31 891	32 529	33 378	34 382	35 251
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	31 180	31 588	31 917	31 436	31 940	32 578	33 427	34 431	35 299
Net Debt	25 043	24 932	24 675	24 309	23 742	23 015	22 112	21 083	19 935
Total Equity	2 663	2 686	2 845	3 142	3 627	4 272	5 080	6 073	7 188
Equity Ratio	10%	10%	10%	11%	13%	16%	19%	22%	27%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with 20 Year Debt with 3.95% Until 25% Equity
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 170	2 173	2 371	2 577	2 734	2 821	2 931	2 897	3 011
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(870)	(885)	(894)	(903)	(935)	(953)	(952)	(966)
Interest Paid	(553)	(532)	(652)	(734)	(814)	(909)	(1 161)	(1 233)	(1 246)	(1 246)	(1 274)
Interest Received	17	5	12	22	26	19	7	6	7	6	8
	810	733	686	592	698	794	676	658	740	704	780
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 360	2 590	1 180	1 570	390	390	1 150	990
Sinking Fund Withdrawals	146	0	0	120	318	813	182	54	350	156	254
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(248)	(261)	(271)	(267)	(275)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(10)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 861	1 308	263	374	(112)	52	318	(214)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 659)	(3 002)	(2 391)	(1 760)	(1 368)	(898)	(700)	(704)	(732)	(756)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 748)	(3 059)	(2 438)	(1 850)	(1 477)	(997)	(796)	(800)	(814)	(838)
Net Increase (Decrease) in Cash	(309)	(147)	(7)	14	156	(420)	53	(249)	(7)	208	(272)
Cash at Beginning of Year	943	634	487	480	494	650	230	283	34	27	235
Cash at End of Year	634	487	480	494	650	230	283	34	27	235	(37)

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with 20 Year Debt with 3.95% Until 25% Equity
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 120	3 255	3 403	3 550	3 704	3 869	4 041	4 227	4 334
Cash Paid to Suppliers and Employees	(980)	(995)	(1 012)	(1 035)	(1 030)	(1 043)	(1 064)	(1 087)	(1 097)
Interest Paid	(1 282)	(1 298)	(1 300)	(1 287)	(1 212)	(1 208)	(1 202)	(1 195)	(1 167)
Interest Received	14	29	40	50	26	48	75	107	119
	872	990	1 130	1 278	1 489	1 665	1 851	2 053	2 190
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	390	390	210	(20)	(10)	(50)	(30)	(60)	(20)
Sinking Fund Withdrawals	150	60	110	796	13	30	0	10	275
Sinking Fund Payment	(275)	(283)	(291)	(300)	(275)	(285)	(295)	(307)	(318)
Retirement of Long-Term Debt	(150)	(60)	(80)	(796)	(13)	0	20	20	(275)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(5)	(5)
	110	102	(57)	(325)	(290)	(312)	(309)	(341)	(343)
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(767)	(798)	(793)	(832)	(840)	(857)	(870)	(948)	(966)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(847)	(873)	(864)	(905)	(913)	(928)	(940)	(1 016)	(1 033)
Net Increase (Decrease) in Cash	134	219	209	49	286	426	602	696	814
Cash at Beginning of Year	(37)	97	317	526	574	861	1 286	1 888	2 585
Cash at End of Year	97	317	526	574	861	1 286	1 888	2 585	3 398

Comparison of Rate Paths - 2017-2036

Manitoba Hydro Proposed Rate Path, PUB 21-b Post 2027																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Year Ended March	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Units	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Price Increase		3.4%	7.9%	7.9%	7.9%	7.9%	7.9%	7.9%	4.5%	2.0%	2.0%	-19.8%	-3.1%	-1.1%	1.8%	-1.1%	0.6%	0.4%	0.7%	3.3%
Nominal Price	$1.00	$1.03	$1.12	$1.20	$1.30	$1.40	$1.51	$1.63	$1.71	$1.74	$1.77	$1.42	$1.38	$1.36	$1.39	$1.37	$1.38	$1.39	$1.40	$1.44
Inflation		2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Inflation Adjusted Price		1.4%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	2.5%	0.0%	0.0%	-21.8%	-5.1%	-3.1%	-0.2%	-3.1%	-1.4%	-1.6%	-1.3%	1.3%
	$1.00	$1.01	$1.07	$1.14	$1.20	$1.27	$1.35	$1.43	$1.47	$1.47	$1.47	$1.15	$1.09	$1.05	$1.05	$1.02	$1.01	$0.99	$0.98	$0.99
Cumulative Real Rate Increase		*1.4%*	*7.3%*	*13.7%*	*20.4%*	*27.5%*	*35.0%*	*43.0%*	*46.6%*	*46.6%*	*46.6%*	*14.7%*	*8.8%*	*5.5%*	*5.3%*	*2.0%*	*0.6%*	*-1.0%*	*-2.3%*	*-1.1%*
Annual Nominal Cost of Power		$1 034	$1 115	$1 203	$1 298	$1 401	$1 512	$1 631	$1 705	$1 739	$1 774	$1 424	$1 379	$1 364	$1 389	$1 374	$1 382	$1 387	$1 397	$1 443
Cumulative Nominal Cost of Power		$1 034	$2 149	$3 352	$4 651	$6 052	$7 563	$9 194	$10 900	$12 639	$14 413	$15 837	$17 216	$18 580	$19 968	$21 342	$22 724	$24 112	$25 509	$26 952
Annual Real Cost of Power		$1 014	$1 073	$1 137	$1 204	$1 275	$1 350	$1 430	$1 466	$1 466	$1 466	$1 147	$1 088	$1 055	$1 053	$1 020	$1 006	$990	$977	$989
Cumulative Real Cost of Power		$1 014	$2 087	$3 224	$4 428	$5 702	$7 052	$8 482	$9 948	$11 414	$12 880	$14 027	$15 116	$16 170	$17 223	$18 243	$19 249	$20 239	$21 216	$22 205
Present Value Cost of Power	5.0%	$1 034	$1 062	$1 091	$1 122	$1 153	$1 184	$1 217	$1 212	$1 177	$1 144	$874	$806	$759	$736	$694	$665	$636	$610	$600
Cumulative PV Cost of Power		$1 034	$2 096	$3 187	$4 309	$5 461	$6 646	$7 863	$9 075	$10 252	$11 396	$12 270	$13 076	$13 836	$14 572	$15 266	$15 931	$16 566	$17 176	$17 776

3.95% Path																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Year Ended March	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Units	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Price Increase		3.36%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%
Nominal Price	$1.00	$1.03	$1.07	$1.12	$1.16	$1.21	$1.25	$1.30	$1.36	$1.41	$1.46	$1.52	$1.58	$1.65	$1.71	$1.78	$1.85	$1.92	$2.00	$2.08
Inflation		2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Inflation Adjusted Price		1.4%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
	$1.00	$1.01	$1.03	$1.05	$1.07	$1.10	$1.12	$1.14	$1.16	$1.18	$1.21	$1.23	$1.25	$1.28	$1.30	$1.33	$1.35	$1.38	$1.41	$1.43
Cumulative Real Rate Increase		*1.4%*	*3.3%*	*5.4%*	*7.4%*	*9.5%*	*11.6%*	*13.8%*	*16.0%*	*18.3%*	*20.6%*	*23.0%*	*25.4%*	*27.8%*	*30.3%*	*32.8%*	*35.4%*	*38.1%*	*40.8%*	*43.5%*
Annual Nominal Cost of Power		$1 034	$1 074	$1 117	$1 161	$1 207	$1 255	$1 304	$1 356	$1 409	$1 465	$1 523	$1 583	$1 645	$1 710	$1 778	$1 848	$1 921	$1 997	$2 076
Cumulative Nominal Cost of Power		$1 034	$2 108	$3 225	$4 386	$5 593	$6 847	$8 151	$9 507	$10 916	$12 381	$13 903	$15 486	$17 132	$18 842	$20 620	$22 468	$24 389	$26 386	$28 462
Annual Real Cost of Power		$1 014	$1 033	$1 054	$1 074	$1 095	$1 116	$1 138	$1 160	$1 183	$1 206	$1 230	$1 254	$1 278	$1 303	$1 328	$1 354	$1 381	$1 408	$1 435
Cumulative Real Cost of Power		$1 014	$2 047	$3 100	$4 175	$5 270	$6 386	$7 524	$8 684	$9 867	$11 073	$12 303	$13 556	$14 834	$16 137	$17 465	$18 820	$20 200	$21 608	$23 043
Present Value Cost of Power	5.0%	$1 034	$1 023	$1 013	$1 003	$993	$983	$973	$963	$954	$944	$935	$925	$916	$907	$898	$889	$880	$871	$863
Cumulative PV Cost of Power		$1 034	$2 057	$3 070	$4 073	$5 066	$6 049	$7 022	$7 985	$8 939	$9 883	$10 818	$11 743	$12 659	$13 566	$14 464	$15 353	$16 233	$17 105	$17 967

Comparison of Rate Paths - 2017-2036

Comparison of Two Plans	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Difference in:																				
Annual Nominal Cost of Power		$0	($41)	($86)	($137)	($194)	($257)	($327)	($350)	($330)	($309)	$99	$204	$281	$322	$404	$466	$534	$600	$633
Annual Real Cost of Power		$0	($40)	($83)	($130)	($180)	($234)	($292)	($306)	($283)	($260)	$82	$165	$223	$250	$308	$348	$391	$430	$446
Annual Present Value Cost of Power		$0	($39)	($78)	($119)	($160)	($201)	($244)	($248)	($223)	($199)	$61	$119	$157	$171	$204	$224	$244	$262	$263
Difference in:																				
Cumulative Nominal Cost of Power		$0	($41)	($127)	($265)	($459)	($716)	($1 043)	($1 393)	($1 723)	($2 032)	($1 933)	($1 730)	($1 448)	($1 127)	($723)	($257)	$277	$877	$1 510
Cumulative Real Cost of Power		$0	($40)	($123)	($253)	($433)	($666)	($958)	($1 264)	($1 547)	($1 807)	($1 724)	($1 559)	($1 336)	($1 086)	($778)	($430)	($39)	$392	$837
Cumulative Present Value Cost of Power		$0	($39)	($117)	($236)	($396)	($597)	($841)	($1 090)	($1 313)	($1 513)	($1 452)	($1 333)	($1 176)	($1 006)	($802)	($577)	($333)	($71)	$192
Cumulative Real Rate Increase in %		0.0%	-4.0%	-8.3%	-13.0%	-18.0%	-23.4%	-29.2%	-30.6%	-28.3%	-26.0%	8.2%	16.5%	22.3%	25.0%	30.8%	34.8%	39.1%	43.0%	44.6%
Equalizing Discount Rate		6.4%																		

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
5-Year Drought Starting in 2022/23 with Rates to Maintain 25% Equity in 2030 On
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	179	315	458	619	789	973	1 094	1 158	1 224
BPIII Reserve Account	(96)	(151)	1	80	80	80	80	27	-	-	-
Extraprovincial	460	514	469	421	568	694	562	525	630	439	483
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 246	2 398	2 675	2 970	3 006	3 101	3 312	3 198	3 326
EXPENSES											
Operating and Administrative	536	518	501	511	513	524	536	547	559	571	583
Finance Expense	608	587	677	744	817	881	1 119	1 155	1 146	1 122	1 113
Finance Income	(17)	(17)	(21)	(28)	(35)	(34)	(38)	(14)	(14)	(15)	(17)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	739	752
Water Rentals and Assessments	131	130	120	110	113	117	94	85	111	106	111
Fuel and Power Purchased	132	124	140	158	165	156	229	302	154	159	149
Capital and Other Taxes	119	132	145	154	161	165	174	175	175	175	175
Other Expenses	60	116	109	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 995	2 150	2 654	2 391	2 506	2 883	3 036	2 931	2 935	2 949
Net Income before Net Movement in Reg. Deferral	(46)	13	96	(256)	284	464	123	64	380	262	377
Net Movement in Regulatory Deferral	66	72	114	464	71	64	43	(48)	(50)	(49)	(45)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	85	209	209	355	528	166	17	331	214	332
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	93	211	206	350	519	156	5	328	212	329
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**93**	**211**	**206**	**350**	**519**	**156**	**5**	**328**	**212**	**329**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	85	209	209	355	528	166	17	331	214	332
* Additional Domestic Revenue											
Percent Increase		3.36%	7.90%	7.90%	7.90%	7.90%	7.90%	7.90%	4.54%	2.00%	2.00%
Cumulative Percent Increase		3.36%	11.53%	20.34%	29.84%	40.10%	51.17%	63.11%	70.52%	73.93%	77.40%
Financial Ratios											
Equity	16%	15%	14%	14%	15%	17%	16%	16%	18%	18%	20%
EBITDA Interest Coverage	1.51	1.54	1.71	1.73	1.84	2.02	1.78	1.71	2.01	1.94	2.07
Capital Coverage	1.53	1.40	1.48	1.47	1.88	2.35	1.72	1.62	2.01	1.77	1.92

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
5-Year Drought Starting in 2022/23 with Rates to Maintain 25% Equity in 2030 On
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	1 294	1 364	751	639	624	647	667	694	787
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	663	678	697	710	706	701	696	694	603
Other	36	37	38	38	39	40	40	40	41
	3 592	3 694	3 117	3 034	3 042	3 090	3 132	3 186	3 217
EXPENSES									
Operating and Administrative	595	607	620	633	646	660	674	688	702
Finance Expense	1 100	1 082	1 056	1 046	1 047	1 061	1 065	1 064	1 062
Finance Income	(22)	(36)	(36)	(16)	(18)	(17)	(17)	(19)	(17)
Depreciation and Amortization	765	776	790	805	822	840	857	872	888
Water Rentals and Assessments	131	131	132	132	132	133	133	133	133
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	177	177	178	179	180	181	182	183	189
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	5	3	3	3	3	3	3
	2 964	2 964	2 971	3 017	3 030	3 079	3 122	3 162	3 190
Net Income before Net Movement in Reg. Deferral	628	730	146	17	12	10	10	24	27
Net Movement in Regulatory Deferral	(44)	(40)	(35)	(33)	(31)	(28)	(28)	(28)	(30)
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	585	690	111	(15)	(18)	(18)	(18)	(4)	(2)
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	581	684	103	(25)	(30)	(30)	(32)	(20)	(19)
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**581**	**684**	**103**	**(25)**	**(30)**	**(30)**	**(32)**	**(20)**	**(19)**
Non-controlling Interest	4	5	8	10	11	13	14	15	16
	585	690	111	(15)	(18)	(18)	(18)	(4)	(2)
* Additional Domestic Revenue									
Percent Increase	2.00%	2.00%	-20.85%	-4.99%	-1.07%	0.56%	0.38%	0.67%	3.28%
Cumulative Percent Increase	80.95%	84.57%	46.08%	38.79%	37.31%	38.09%	38.62%	39.54%	44.13%
Financial Ratios									
Equity	22%	25%	25%	25%	25%	25%	25%	25%	25%
EBITDA Interest Coverage	2.33	2.47	1.97	1.85	1.87	1.87	1.88	1.91	1.93
Capital Coverage	2.29	2.36	1.56	1.33	1.34	1.34	1.34	1.26	1.25

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
5-Year Drought Starting in 2022/23 with Rates to Maintain 25% Equity in 2030 On
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 168	30 504	31 034	31 670	32 334	32 945
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 705)	(4 328)	(4 942)	(5 607)	(6 212)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 043	26 799	26 706	26 727	26 727	26 732
Construction in Progress	7 079	9 471	6 745	7 522	8 012	3 836	367	454	418	414	411
Current and Other Assets	1 773	1 915	2 269	2 499	2 571	1 950	1 702	1 712	1 751	1 730	2 000
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 305	27 127	28 453	30 062	30 130	30 123	30 083	30 063	29 994	30 224
Regulatory Deferral Balance	462	533	647	1 111	1 182	1 246	1 289	1 241	1 192	1 143	1 098
	21 733	24 839	27 774	29 564	31 245	31 376	31 412	31 324	31 255	31 137	31 322
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 189	22 994	22 850	23 874	23 566	22 878	22 017	22 859
Current and Other Liabilities	3 204	3 643	3 046	3 815	4 356	4 145	3 024	3 178	3 459	3 980	2 984
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	346	266	186	106	27	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 842	3 053	3 259	3 608	4 127	4 283	4 289	4 616	4 828	5 157
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(497)	(449)	(370)	(369)	(368)	(368)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 790	27 725	29 516	31 196	31 328	31 363	31 275	31 206	31 088	31 273
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 839	27 774	29 564	31 245	31 376	31 412	31 324	31 255	31 137	31 322
Net Debt	15 427	18 473	20 743	22 406	23 294	23 602	23 658	23 502	23 073	22 763	22 339
Total Equity	2 856	3 163	3 511	3 771	4 146	4 670	4 509	4 588	4 931	5 156	5 499
Equity Ratio	16%	15%	14%	14%	15%	17%	16%	16%	18%	18%	20%

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
5-Year Drought Starting in 2022/23 with Rates to Maintain 25% Equity in 2030 On
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
ASSETS									
Plant in Service	33 553	34 299	34 958	35 790	36 566	37 361	38 104	38 907	39 975
Accumulated Depreciation	(6 906)	(7 603)	(8 311)	(9 040)	(9 788)	(10 577)	(11 366)	(12 168)	(12 975)
Net Plant in Service	26 647	26 696	26 647	26 749	26 778	26 785	26 739	26 739	26 999
Construction in Progress	493	454	490	400	374	366	406	461	257
Current and Other Assets	2 556	3 291	2 250	2 125	2 394	2 438	2 588	3 051	3 808
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	30 735	31 442	30 350	30 198	30 431	30 436	30 542	31 024	31 800
Regulatory Deferral Balance	1 055	1 014	980	947	916	888	860	832	802
	31 790	32 456	31 329	31 145	31 347	31 324	31 402	31 855	32 602
LIABILITIES AND EQUITY									
Long-Term Debt	22 791	20 414	17 121	19 181	19 345	20 570	20 280	21 459	22 543
Current and Other Liabilities	2 928	5 279	7 333	5 104	5 163	3 936	4 326	3 609	3 280
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	5 738	6 422	6 525	6 500	6 471	6 440	6 408	6 388	6 370
Accumulated Other Comprehensive Income	(368)	(368)	(368)	(368)	(368)	(368)	(368)	(368)	(368)
Total Liabilities and Equity before Regulatory Deferral	31 741	32 407	31 281	31 097	31 299	31 275	31 353	31 806	32 553
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	31 790	32 456	31 329	31 145	31 347	31 324	31 402	31 855	32 602
Net Debt	21 659	20 890	20 688	20 636	20 571	20 506	20 435	20 404	20 378
Total Equity	6 095	6 785	6 896	6 879	6 857	6 835	6 812	6 801	6 793
Equity Ratio	22%	25%	25%	25%	25%	25%	25%	25%	25%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
5-Year Drought Starting in 2022/23 with Rates to Maintain 25% Equity in 2030 On
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 233	2 307	2 583	2 878	2 914	3 062	3 299	3 185	3 313
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(869)	(885)	(894)	(960)	(1 059)	(948)	(959)	(965)
Interest Paid	(553)	(531)	(635)	(700)	(762)	(830)	(1 068)	(1 128)	(1 124)	(1 103)	(1 090)
Interest Received	17	5	12	22	26	20	7	6	7	8	10
	810	734	767	760	962	1 173	894	881	1 235	1 131	1 268
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 160	2 190	990	1 360	190	(10)	350	990
Sinking Fund Withdrawals	146	0	0	120	318	813	182	46	339	142	236
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(240)	(251)	(257)	(250)	(251)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(10)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 661	908	73	172	(309)	(344)	(477)	(208)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 660)	(3 002)	(2 391)	(1 760)	(1 368)	(898)	(700)	(704)	(732)	(756)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 749)	(3 059)	(2 438)	(1 850)	(1 477)	(997)	(796)	(800)	(814)	(838)
Net Increase (Decrease) in Cash	(309)	(145)	74	(17)	20	(231)	69	(224)	91	(160)	223
Cash at Beginning of Year	943	634	488	562	545	566	335	404	180	271	111
Cash at End of Year	634	488	562	545	566	335	404	180	271	111	333

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
5-Year Drought Starting in 2022/23 with Rates to Maintain 25% Equity in 2030 On
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 579	3 680	3 103	3 020	3 028	3 075	3 118	3 172	3 203
Cash Paid to Suppliers and Employees	(980)	(995)	(1 012)	(1 034)	(1 029)	(1 042)	(1 062)	(1 085)	(1 095)
Interest Paid	(1 083)	(1 078)	(1 060)	(1 040)	(1 026)	(1 051)	(1 060)	(1 064)	(1 073)
Interest Received	19	42	44	19	14	22	22	33	33
	1 535	1 649	1 074	965	986	1 004	1 018	1 055	1 068
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	(10)	(10)	1 170	4 190	2 350	2 140	960	1 700	1 170
Sinking Fund Withdrawals	150	60	310	591	0	230	36	10	275
Sinking Fund Payment	(249)	(252)	(256)	(242)	(228)	(239)	(239)	(249)	(262)
Retirement of Long-Term Debt	(150)	(60)	(2 440)	(4 396)	(2 173)	(2 190)	(908)	(1 294)	(465)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(4)	(5)
	(264)	(267)	(1 222)	138	(56)	(66)	(156)	163	714
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(767)	(798)	(793)	(832)	(840)	(857)	(870)	(948)	(966)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(847)	(873)	(864)	(905)	(913)	(928)	(940)	(1 016)	(1 033)
Net Increase (Decrease) in Cash	424	510	(1 012)	199	17	10	(77)	202	748
Cash at Beginning of Year	333	757	1 267	255	454	472	482	405	607
Cash at End of Year	757	1 267	255	454	472	482	405	607	1 355

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
5-Year Drought Starting in 2022/23 with 3.95% to 2023, 9.92% to 2027, -0.93% to Achieve 25% in 2036
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	116	181	247	319	392	584	800	1 043	1 315
BPIII Reserve Account	(96)	(151)	3	79	79	79	79	26	-	-	-
Extraprovincial	460	514	469	421	568	694	562	525	630	439	483
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 184	2 264	2 464	2 670	2 609	2 712	3 018	3 083	3 417
EXPENSES											
Operating and Administrative	536	518	501	511	513	524	536	547	559	571	583
Finance Expense	608	590	698	782	874	959	1 223	1 282	1 308	1 306	1 319
Finance Income	(17)	(17)	(21)	(29)	(35)	(34)	(38)	(12)	(14)	(15)	(19)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	739	752
Water Rentals and Assessments	131	130	120	110	113	117	94	85	111	106	111
Fuel and Power Purchased	132	124	140	158	165	156	229	302	154	159	149
Capital and Other Taxes	119	132	145	154	161	165	174	174	175	175	175
Other Expenses	60	116	109	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 998	2 171	2 692	2 448	2 583	2 987	3 166	3 094	3 120	3 154
Net Income before Net Movement in Reg. Deferral	(46)	10	13	(428)	15	87	(378)	(454)	(76)	(37)	263
Net Movement in Regulatory Deferral	66	72	114	464	71	64	43	(48)	(50)	(49)	(45)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	82	127	37	86	151	(335)	(502)	(126)	(85)	218
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	90	128	34	81	142	(345)	(513)	(129)	(88)	215
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**90**	**128**	**34**	**81**	**142**	**(345)**	**(513)**	**(129)**	**(88)**	**215**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	82	127	37	86	151	(335)	(502)	(126)	(85)	218
* Additional Domestic Revenue											
Percent Increase		3.36%	3.95%	3.95%	3.95%	3.95%	3.95%	9.92%	9.92%	9.92%	9.92%
Cumulative Percent Increase		3.36%	7.44%	11.69%	16.10%	20.68%	25.45%	37.89%	51.57%	66.60%	83.12%
Financial Ratios											
Equity	16%	15%	14%	13%	13%	13%	11%	10%	9%	9%	10%
EBITDA Interest Coverage	1.51	1.53	1.61	1.54	1.58	1.64	1.31	1.24	1.54	1.58	1.82
Capital Coverage	1.53	1.39	1.33	1.15	1.37	1.59	0.77	0.68	1.27	1.31	1.75

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
5-Year Drought Starting in 2022/23 with 3.95% to 2023, 9.92% to 2027, -0.93% to Achieve 25% in 2036
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	1 301	1 286	1 272	1 258	1 250	1 243	1 236	1 228	1 220
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	663	678	697	710	706	701	696	694	603
Other	36	37	38	38	39	40	40	40	41
	3 599	3 615	3 637	3 653	3 669	3 685	3 701	3 719	3 649
EXPENSES									
Operating and Administrative	595	607	620	633	646	660	674	688	702
Finance Expense	1 306	1 285	1 269	1 241	1 194	1 177	1 158	1 136	1 096
Finance Income	(19)	(26)	(38)	(44)	(47)	(55)	(62)	(69)	(59)
Depreciation and Amortization	765	776	790	805	822	840	856	872	888
Water Rentals and Assessments	131	131	132	132	132	133	133	133	133
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	176	177	178	179	180	182	183	184	190
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	6	4	4	4	4	4	4
	3 172	3 177	3 182	3 185	3 150	3 160	3 172	3 185	3 184
Net Income before Net Movement in Reg. Deferral	428	438	456	468	519	526	529	534	465
Net Movement in Regulatory Deferral	(44)	(40)	(35)	(33)	(31)	(28)	(28)	(28)	(30)
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	384	398	421	435	488	498	500	506	435
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	380	393	413	425	477	485	486	490	418
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**380**	**393**	**413**	**425**	**477**	**485**	**486**	**490**	**418**
Non-controlling Interest	4	6	8	10	11	13	14	16	16
	384	398	421	435	488	498	500	506	435
* Additional Domestic Revenue									
Percent Increase	-0.93%	-0.93%	-0.93%	-0.93%	-0.93%	-0.93%	-0.93%	-0.93%	-0.93%
Cumulative Percent Increase	81.41%	79.73%	78.05%	76.39%	74.75%	73.13%	71.51%	69.92%	68.34%
Financial Ratios									
Equity	11%	13%	14%	16%	18%	20%	22%	23%	25%
EBITDA Interest Coverage	1.96	2.00	2.05	2.10	2.21	2.26	2.31	2.36	2.34
Capital Coverage	1.99	1.95	2.02	1.95	2.03	2.02	2.02	1.87	1.76

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
5-Year Drought Starting in 2022/23 with 3.95% to 2023, 9.92% to 2027, -0.93% to Achieve 25% in 2036
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 166	30 501	31 031	31 667	32 331	32 942
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 705)	(4 328)	(4 942)	(5 607)	(6 212)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 042	26 796	26 703	26 724	26 725	26 730
Construction in Progress	7 079	9 471	6 745	7 523	8 012	3 837	370	457	421	417	414
Current and Other Assets	1 773	1 913	2 186	2 448	2 657	1 848	1 516	1 815	1 598	1 885	2 041
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 304	27 045	28 403	30 149	30 029	29 938	30 186	29 909	30 149	30 266
Regulatory Deferral Balance	462	533	647	1 111	1 182	1 246	1 289	1 241	1 192	1 143	1 098
	21 733	24 837	27 692	29 514	31 331	31 275	31 226	31 427	31 101	31 292	31 364
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 389	23 594	23 639	25 064	25 534	25 045	24 784	25 626
Current and Other Liabilities	3 204	3 644	3 052	3 823	4 369	4 158	3 042	3 203	3 484	4 013	3 017
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	344	265	185	106	26	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 839	2 967	3 001	3 082	3 224	2 879	2 366	2 237	2 150	2 365
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(496)	(439)	(338)	(337)	(336)	(336)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 788	27 643	29 466	31 283	31 226	31 178	31 378	31 052	31 243	31 315
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 837	27 692	29 514	31 331	31 275	31 226	31 427	31 101	31 292	31 364
Net Debt	15 427	18 474	20 825	22 656	23 807	24 493	25 034	25 367	25 395	25 376	25 065
Total Equity	2 856	3 160	3 424	3 512	3 619	3 767	3 115	2 699	2 584	2 511	2 740
Equity Ratio	16%	15%	14%	13%	13%	13%	11%	10%	9%	9%	10%

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
5-Year Drought Starting in 2022/23 with 3.95% to 2023, 9.92% to 2027, -0.93% to Achieve 25% in 2036
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
ASSETS									
Plant in Service	33 550	34 296	34 956	35 787	36 563	37 358	38 102	38 904	39 972
Accumulated Depreciation	(6 906)	(7 602)	(8 311)	(9 040)	(9 788)	(10 576)	(11 365)	(12 168)	(12 975)
Net Plant in Service	26 644	26 693	26 645	26 747	26 776	26 782	26 737	26 737	26 997
Construction in Progress	495	457	493	403	377	369	409	464	260
Current and Other Assets	2 396	2 839	3 516	3 230	3 801	4 355	4 961	5 483	5 674
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	30 576	30 991	31 616	31 304	31 838	32 354	32 916	33 456	33 667
Regulatory Deferral Balance	1 055	1 014	980	947	916	888	860	832	802
	31 631	32 005	32 596	32 251	32 755	33 242	33 776	34 288	34 468
LIABILITIES AND EQUITY									
Long-Term Debt	25 559	25 501	24 888	24 859	24 882	24 846	24 850	24 488	24 373
Current and Other Liabilities	2 962	2 993	3 774	3 024	3 019	3 048	3 083	3 455	3 323
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	2 744	3 137	3 550	3 976	4 452	4 937	5 423	5 913	6 331
Accumulated Other Comprehensive Income	(336)	(336)	(336)	(336)	(336)	(336)	(336)	(336)	(336)
Total Liabilities and Equity before Regulatory Deferral	31 582	31 956	32 547	32 202	32 706	33 193	33 728	34 239	34 420
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	31 631	32 005	32 596	32 251	32 755	33 242	33 776	34 288	34 468
Net Debt	24 586	24 109	23 589	23 088	22 521	21 944	21 356	20 820	20 360
Total Equity	3 134	3 532	3 953	4 386	4 871	5 364	5 859	6 358	6 787
Equity Ratio	11%	13%	14%	16%	18%	20%	22%	23%	25%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
5-Year Drought Starting in 2022/23 with 3.95% to 2023, 9.92% to 2027, -0.93% to Achieve 25% in 2036
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 170	2 173	2 372	2 578	2 517	2 673	3 005	3 070	3 404
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(869)	(884)	(894)	(959)	(1 059)	(947)	(959)	(965)
Interest Paid	(553)	(532)	(652)	(734)	(814)	(909)	(1 166)	(1 248)	(1 286)	(1 279)	(1 296)
Interest Received	17	5	12	22	26	20	8	4	7	7	12
	810	733	686	593	699	795	400	369	779	840	1 155
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 360	2 590	1 180	1 770	990	190	950	990
Sinking Fund Withdrawals	146	0	0	120	318	813	182	54	352	162	259
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(248)	(263)	(277)	(273)	(279)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(10)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 861	1 308	263	574	486	(152)	119	(212)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 659)	(3 002)	(2 391)	(1 760)	(1 368)	(898)	(700)	(704)	(732)	(756)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 748)	(3 059)	(2 438)	(1 850)	(1 477)	(997)	(796)	(800)	(814)	(838)
Net Increase (Decrease) in Cash	(309)	(147)	(7)	15	157	(419)	(24)	60	(173)	145	105
Cash at Beginning of Year	943	634	487	480	495	652	234	210	270	97	242
Cash at End of Year	634	487	480	495	652	234	210	270	97	242	347

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
5-Year Drought Starting in 2022/23 with 3.95% to 2023, 9.92% to 2027, -0.93% to Achieve 25% in 2036
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 586	3 602	3 624	3 639	3 654	3 671	3 686	3 705	3 635
Cash Paid to Suppliers and Employees	(979)	(995)	(1 012)	(1 035)	(1 030)	(1 043)	(1 063)	(1 086)	(1 096)
Interest Paid	(1 291)	(1 285)	(1 276)	(1 263)	(1 187)	(1 184)	(1 178)	(1 171)	(1 143)
Interest Received	19	36	56	73	51	72	92	112	107
	1 334	1 357	1 392	1 414	1 488	1 515	1 536	1 560	1 502
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	(10)	(10)	210	(20)	(10)	(50)	(30)	(60)	(20)
Sinking Fund Withdrawals	150	60	110	796	13	30	0	10	275
Sinking Fund Payment	(278)	(282)	(287)	(296)	(270)	(281)	(290)	(302)	(313)
Retirement of Long-Term Debt	(150)	(60)	(80)	(796)	(13)	0	20	20	(275)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(5)	(5)
	(293)	(297)	(53)	(321)	(286)	(307)	(304)	(336)	(338)
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(767)	(798)	(793)	(832)	(840)	(857)	(870)	(948)	(966)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(847)	(873)	(864)	(905)	(913)	(928)	(940)	(1 016)	(1 033)
Net Increase (Decrease) in Cash	194	188	475	189	290	280	292	208	131
Cash at Beginning of Year	347	541	729	1 204	1 393	1 682	1 962	2 254	2 462
Cash at End of Year	541	729	1 204	1 393	1 682	1 962	2 254	2 462	2 593

Comparison of Rate Paths - 2017-2036

Manitoba Hydro Proposed Rate Path, PUB 21-b Post 2027 (5 year Drought 2023-2027)																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Year Ended March	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Units	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Price Increase		3.4%	7.9%	7.9%	7.9%	7.9%	7.9%	7.9%	4.5%	2.0%	2.0%	2.0%	2.0%	-20.9%	-5.0%	-1.1%	0.6%	0.4%	0.7%	3.3%
Nominal Price	$1.00	$1.03	$1.12	$1.20	$1.30	$1.40	$1.51	$1.63	$1.71	$1.74	$1.77	$1.81	$1.85	$1.46	$1.39	$1.37	$1.38	$1.39	$1.40	$1.44
Inflation		2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Inflation Adjusted Price		1.4%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	2.5%	0.0%	0.0%	0.0%	0.0%	-22.9%	-7.0%	-3.1%	-1.4%	-1.6%	-1.3%	1.3%
	$1.00	$1.01	$1.07	$1.14	$1.20	$1.27	$1.35	$1.43	$1.47	$1.47	$1.47	$1.47	$1.47	$1.13	$1.05	$1.02	$1.01	$0.99	$0.98	$0.99
Cumulative Real Rate Increase		*1.4%*	*7.3%*	*13.7%*	*20.4%*	*27.5%*	*35.0%*	*43.0%*	*46.6%*	*46.6%*	*46.6%*	*46.6%*	*46.6%*	*13.1%*	*5.2%*	*2.0%*	*0.5%*	*-1.1%*	*-2.4%*	*-1.2%*
Annual Nominal Cost of Power		$1 034	$1 115	$1 203	$1 298	$1 401	$1 512	$1 631	$1 705	$1 739	$1 774	$1 810	$1 846	$1 461	$1 388	$1 373	$1 381	$1 386	$1 395	$1 441
Cumulative Nominal Cost of Power		$1 034	$2 149	$3 352	$4 651	$6 052	$7 563	$9 194	$10 900	$12 639	$14 413	$16 222	$18 068	$19 529	$20 917	$22 290	$23 671	$25 057	$26 452	$27 894
Annual Real Cost of Power		$1 014	$1 073	$1 137	$1 204	$1 275	$1 350	$1 430	$1 466	$1 466	$1 466	$1 466	$1 466	$1 131	$1 052	$1 020	$1 005	$989	$976	$988
Cumulative Real Cost of Power		$1 014	$2 087	$3 224	$4 428	$5 702	$7 052	$8 482	$9 948	$11 414	$12 880	$14 346	$15 812	$16 943	$17 995	$19 015	$20 020	$21 008	$21 984	$22 972
Present Value Cost of Power	5.0%	$1 034	$1 062	$1 091	$1 122	$1 153	$1 184	$1 217	$1 212	$1 177	$1 144	$1 111	$1 079	$813	$736	$694	$664	$635	$609	$599
Cumulative PV Cost of Power		$1 034	$2 096	$3 187	$4 309	$5 461	$6 646	$7 863	$9 075	$10 252	$11 396	$12 507	$13 586	$14 399	$15 135	$15 829	$16 493	$17 128	$17 737	$18 336

3.95% Path (5 Year Drought 2023-2027)																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Year Ended March	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Units	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Price Increase		3.36%	3.95%	3.95%	3.95%	3.95%	9.90%	9.90%	9.90%	9.90%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%
Nominal Price	$1.00	$1.03	$1.07	$1.12	$1.16	$1.21	$1.33	$1.46	$1.60	$1.76	$1.76	$1.76	$1.76	$1.76	$1.76	$1.76	$1.76	$1.76	$1.76	$1.76
Inflation		2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Inflation Adjusted Price		1.4%	2.0%	2.0%	2.0%	2.0%	7.9%	7.9%	7.9%	7.9%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%
	$1.00	$1.01	$1.03	$1.05	$1.07	$1.10	$1.18	$1.27	$1.38	$1.48	$1.45	$1.43	$1.40	$1.37	$1.34	$1.31	$1.29	$1.26	$1.24	$1.21
Cumulative Real Rate Increase		*1.4%*	*3.3%*	*5.4%*	*7.4%*	*9.5%*	*18.2%*	*27.5%*	*37.6%*	*48.4%*	*45.4%*	*42.5%*	*39.7%*	*36.8%*	*34.1%*	*31.4%*	*28.8%*	*26.2%*	*23.6%*	*21.2%*
Annual Nominal Cost of Power		$1 034	$1 074	$1 117	$1 161	$1 207	$1 326	$1 458	$1 602	$1 761	$1 760	$1 760	$1 760	$1 760	$1 760	$1 760	$1 759	$1 759	$1 759	$1 759
Cumulative Nominal Cost of Power		$1 034	$2 108	$3 225	$4 386	$5 593	$6 919	$8 377	$9 979	$11 739	$13 499	$15 260	$17 020	$18 780	$20 539	$22 299	$24 058	$25 817	$27 576	$29 335
Annual Real Cost of Power		$1 014	$1 033	$1 054	$1 074	$1 095	$1 182	$1 275	$1 376	$1 484	$1 454	$1 425	$1 397	$1 368	$1 341	$1 314	$1 288	$1 262	$1 236	$1 212
Cumulative Real Cost of Power		$1 014	$2 047	$3 100	$4 175	$5 270	$6 451	$7 726	$9 101	$10 586	$12 040	$13 465	$14 862	$16 230	$17 571	$18 885	$20 173	$21 435	$22 671	$23 883
Present Value Cost of Power	5.0%	$1 034	$1 023	$1 013	$1 003	$993	$1 039	$1 088	$1 138	$1 192	$1 135	$1 081	$1 029	$980	$933	$889	$846	$806	$767	$731
Cumulative PV Cost of Power		$1 034	$2 057	$3 070	$4 073	$5 066	$6 105	$7 193	$8 331	$9 523	$10 657	$11 738	$12 767	$13 747	$14 680	$15 569	$16 415	$17 221	$17 989	$18 719

Comparison of Rate Paths - 2017-2036

Comparison of Two Plans with 5 Year Drought	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Difference in:																				
Annual Nominal Cost of Power		$0	($41)	($86)	($137)	($194)	($185)	($173)	($103)	$21	($14)	($49)	($86)	$299	$372	$386	$379	$373	$364	$318
Annual Real Cost of Power		$0	($40)	($83)	($130)	($180)	($169)	($155)	($90)	$18	($12)	($41)	($69)	$238	$289	$294	$283	$273	$261	$223
Annual Present Value Cost of Power		$0	($39)	($78)	($119)	($160)	($145)	($129)	($73)	$14	($9)	($30)	($50)	$167	$197	$195	$182	$171	$159	$132
Difference in:																				
Cumulative Nominal Cost of Power		$0	($41)	($127)	($265)	($459)	($644)	($818)	($921)	($900)	($913)	($963)	($1 048)	($749)	($378)	$9	$387	$760	$1 124	$1 442
Cumulative Real Cost of Power		$0	($40)	($123)	($253)	($433)	($601)	($756)	($847)	($828)	($840)	($881)	($950)	($713)	($424)	($129)	$153	$426	$687	$911
Cumulative Present Value Cost of Power		$0	($39)	($117)	($236)	($396)	($541)	($670)	($744)	($729)	($738)	($769)	($819)	($652)	($455)	($260)	($78)	$93	$252	$384
Cumulative Real Rate Increase in %		0.0%	-4.0%	-8.3%	-13.0%	-18.0%	-16.9%	-15.5%	-9.0%	1.8%	-1.2%	-4.1%	-6.9%	23.8%	28.9%	29.4%	28.3%	27.3%	26.1%	22.3%
Equalizing Discount Rate		9.1%																		

APPENDIX 2.1 - MH16 Update with Interim Assuming 500 Fewer EFTs

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with 500 Fewer EFTs in 2018/19 On
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	172	298	431	580	736	905	1 023	1 084	1 149
BPIII Reserve Account	(96)	(151)	2	80	80	80	80	27	-	-	-
Extraprovincial	460	514	469	420	567	693	779	788	805	667	671
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 238	2 381	2 647	2 931	3 170	3 296	3 415	3 353	3 438
EXPENSES											
Operating and Administrative	536	518	446	455	456	465	477	487	497	508	518
Finance Expense	608	587	677	745	815	877	1 112	1 140	1 124	1 093	1 057
Finance Income	(17)	(17)	(21)	(29)	(35)	(34)	(40)	(21)	(27)	(30)	(24)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	739	752
Water Rentals and Assessments	131	130	120	110	113	117	127	128	131	131	131
Fuel and Power Purchased	132	124	140	158	165	156	140	135	138	127	129
Capital and Other Taxes	119	132	145	154	161	165	174	175	175	175	176
Other Expenses	60	116	164	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 995	2 150	2 598	2 332	2 445	2 759	2 830	2 840	2 822	2 823
Net Income before Net Movement in Reg. Deferral	(46)	13	88	(218)	315	486	411	466	575	531	615
Net Movement in Regulatory Deferral	66	72	114	464	71	64	43	(48)	(50)	(49)	(45)
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	85	202	247	386	550	454	418	526	483	570
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	93	203	244	381	541	444	407	522	480	567
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**93**	**203**	**244**	**381**	**541**	**444**	**407**	**522**	**480**	**567**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	85	202	247	386	550	454	418	526	483	570
* Additional Domestic Revenue											
Percent Increase		3.36%	7.41%	7.41%	7.41%	7.41%	7.41%	7.41%	4.54%	2.00%	2.00%
Cumulative Percent Increase		3.36%	11.02%	19.25%	28.08%	37.57%	47.77%	58.72%	65.93%	69.24%	72.63%
Financial Ratios											
Equity	16%	15%	14%	15%	15%	17%	17%	19%	21%	23%	25%
EBITDA Interest Coverage	1.51	1.54	1.70	1.76	1.87	2.04	2.04	2.07	2.21	2.23	2.36
Capital Coverage	1.53	1.40	1.47	1.55	1.94	2.39	2.27	2.36	2.32	2.19	2.28

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with 500 Fewer EFTs in 2018/19 On
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	1 216	1 284	1 356	1 430	1 515	1 605	1 698	1 796	1 897
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	662	677	697	709	705	701	696	694	602
Other	36	37	38	38	39	40	40	40	41
	3 513	3 613	3 721	3 825	3 933	4 046	4 163	4 287	4 326
EXPENSES									
Operating and Administrative	529	540	552	563	575	587	600	612	625
Finance Expense	1 038	1 020	995	908	851	803	742	669	607
Finance Income	(31)	(48)	(58)	(17)	(20)	(20)	(24)	(26)	(42)
Depreciation and Amortization	765	776	790	805	822	840	857	872	888
Water Rentals and Assessments	132	132	132	133	133	133	134	134	134
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	177	178	178	179	180	181	182	183	190
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	5	3	3	3	3	3	3
	2 827	2 824	2 819	2 808	2 762	2 746	2 719	2 685	2 634
Net Income before Net Movement in Reg. Deferral	687	789	901	1 017	1 171	1 300	1 443	1 601	1 692
Net Movement in Regulatory Deferral	(44)	(40)	(35)	(33)	(31)	(28)	(28)	(28)	(30)
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	643	749	867	984	1 140	1 272	1 415	1 573	1 662
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	639	743	859	975	1 129	1 259	1 401	1 557	1 646
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**639**	**743**	**859**	**975**	**1 129**	**1 259**	**1 401**	**1 557**	**1 646**
Non-controlling Interest	4	5	8	10	11	13	14	15	16
	643	749	867	984	1 140	1 272	1 415	1 573	1 662
* Additional Domestic Revenue									
Percent Increase	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Percent Increase	76.08%	79.60%	83.19%	86.86%	90.60%	94.41%	98.30%	102.26%	106.31%
Financial Ratios									
Equity	27%	30%	33%	37%	41%	46%	51%	57%	63%
EBITDA Interest Coverage	2.47	2.64	2.84	3.07	3.43	3.76	4.22	4.83	5.50
Capital Coverage	2.38	2.45	2.66	2.69	2.92	3.06	3.23	3.13	3.20

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim with 500 Fewer EFTs in 2018/19 On
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 168	30 504	31 034	31 670	32 334	32 945
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 705)	(4 328)	(4 942)	(5 607)	(6 212)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 043	26 799	26 706	26 727	26 727	26 732
Construction in Progress	7 079	9 471	6 745	7 522	8 012	3 836	367	454	418	414	411
Current and Other Assets	1 773	1 915	2 261	2 529	2 631	1 828	1 871	2 082	2 316	2 163	2 267
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 305	27 119	28 483	30 122	30 009	30 292	30 453	30 628	30 427	30 491
Regulatory Deferral Balance	462	533	647	1 111	1 182	1 246	1 289	1 241	1 192	1 143	1 098
	21 733	24 839	27 766	29 595	31 305	31 255	31 581	31 694	31 819	31 570	31 589
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 189	22 994	22 650	23 681	23 178	22 490	21 229	21 671
Current and Other Liabilities	3 204	3 643	3 046	3 815	4 354	4 140	3 021	3 175	3 456	3 977	2 976
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	346	266	186	106	27	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 842	3 045	3 289	3 670	4 211	4 655	5 062	5 584	6 064	6 631
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(497)	(455)	(383)	(382)	(381)	(381)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 790	27 717	29 546	31 256	31 206	31 532	31 645	31 771	31 522	31 540
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 839	27 766	29 595	31 305	31 255	31 581	31 694	31 819	31 570	31 589
Net Debt	15 427	18 473	20 751	22 375	23 234	23 524	23 296	22 744	22 121	21 542	20 885
Total Equity	2 856	3 163	3 503	3 801	4 207	4 753	4 875	5 349	5 886	6 380	6 962
Equity Ratio	16%	15%	14%	15%	15%	17%	17%	19%	21%	23%	25%

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim with 500 Fewer EFTs in 2018/19 On
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
ASSETS									
Plant in Service	33 553	34 299	34 958	35 790	36 566	37 361	38 104	38 907	39 975
Accumulated Depreciation	(6 906)	(7 603)	(8 311)	(9 040)	(9 788)	(10 577)	(11 366)	(12 168)	(12 975)
Net Plant in Service	26 647	26 696	26 647	26 749	26 778	26 785	26 739	26 739	26 999
Construction in Progress	493	454	490	400	374	366	406	461	257
Current and Other Assets	2 881	3 675	2 390	2 055	2 279	2 608	3 578	3 799	5 218
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	31 061	31 826	30 489	30 128	30 316	30 606	31 532	31 772	33 210
Regulatory Deferral Balance	1 055	1 014	980	947	916	888	860	832	802
	32 115	32 840	31 469	31 075	31 232	31 494	32 392	32 603	34 012
LIABILITIES AND EQUITY									
Long-Term Debt	21 604	19 226	14 933	15 794	14 757	15 170	14 080	13 659	13 543
Current and Other Liabilities	2 921	5 271	7 325	5 088	5 143	3 723	4 301	3 365	3 233
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	7 270	8 013	8 872	9 847	10 976	12 235	13 636	15 193	16 839
Accumulated Other Comprehensive Income	(381)	(381)	(381)	(381)	(381)	(381)	(381)	(381)	(381)
Total Liabilities and Equity before Regulatory Deferral	32 066	32 791	31 420	31 026	31 183	31 445	32 344	32 555	33 963
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	32 115	32 840	31 469	31 075	31 232	31 494	32 392	32 603	34 012
Net Debt	20 146	19 318	18 361	17 318	16 099	14 748	13 245	11 656	9 968
Total Equity	7 615	8 364	9 230	10 213	11 350	12 618	14 027	15 594	17 250
Equity Ratio	27%	30%	33%	37%	41%	46%	51%	57%	63%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with 500 Fewer EFTs in 2018/19 On
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 225	2 290	2 555	2 838	3 078	3 257	3 403	3 340	3 425
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(814)	(828)	(836)	(844)	(875)	(891)	(889)	(902)
Interest Paid	(553)	(531)	(635)	(700)	(762)	(830)	(1 059)	(1 113)	(1 101)	(1 073)	(1 038)
Interest Received	17	5	12	22	26	19	9	13	20	22	17
	810	734	759	799	992	1 192	1 184	1 282	1 430	1 400	1 502
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 160	2 190	790	1 360	(10)	(10)	(50)	590
Sinking Fund Withdrawals	146	0	0	120	318	813	182	44	337	138	232
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(238)	(249)	(253)	(245)	(242)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(10)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 661	908	(127)	174	(509)	(342)	(877)	(603)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 660)	(3 002)	(2 391)	(1 760)	(1 368)	(898)	(700)	(704)	(732)	(756)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 749)	(3 059)	(2 438)	(1 850)	(1 477)	(997)	(796)	(800)	(814)	(838)
Net Increase (Decrease) in Cash	(309)	(145)	66	22	50	(412)	361	(23)	288	(292)	61
Cash at Beginning of Year	943	634	488	554	576	625	213	574	551	840	548
Cash at End of Year	634	488	554	576	625	213	574	551	840	548	609

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with 500 Fewer EFTs in 2018/19 On
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 500	3 599	3 707	3 811	3 919	4 032	4 148	4 272	4 312
Cash Paid to Suppliers and Employees	(915)	(929)	(944)	(965)	(959)	(971)	(989)	(1 011)	(1 020)
Interest Paid	(1 020)	(1 015)	(998)	(909)	(834)	(796)	(743)	(691)	(622)
Interest Received	28	52	64	19	16	24	35	43	59
	1 593	1 708	1 830	1 956	2 141	2 289	2 451	2 613	2 729
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	(10)	(10)	170	2 990	1 150	1 140	160	(100)	(30)
Sinking Fund Withdrawals	150	60	310	520	0	30	29	10	275
Sinking Fund Payment	(237)	(239)	(243)	(218)	(195)	(193)	(188)	(189)	(182)
Retirement of Long-Term Debt	(150)	(60)	(2 440)	(4 396)	(2 173)	(2 190)	(721)	(1 294)	(265)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(4)	(5)
	(252)	(254)	(2 208)	(1 109)	(1 223)	(1 219)	(724)	(1 577)	(207)
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(767)	(798)	(793)	(832)	(840)	(857)	(870)	(948)	(966)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(847)	(873)	(864)	(905)	(913)	(928)	(940)	(1 016)	(1 033)
Net Increase (Decrease) in Cash	494	581	(1 243)	(58)	6	142	787	20	1 489
Cash at Beginning of Year	609	1 103	1 685	442	384	390	532	1 319	1 339
Cash at End of Year	1 103	1 685	442	384	390	532	1 319	1 339	2 829

APPENDIX 3.1 – MH16 Updated with Interim Adjusted for Mr. Bowman's Assumptions

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with Bowman Assumptions 25% Equity in 2026/27
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	175	306	444	598	761	936	1 056	1 118	1 184
BPIII Reserve Account	(96)	(151)	2	80	80	80	80	27	-	-	-
Extraprovincial	460	514	469	420	567	693	779	788	805	667	671
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 242	2 389	2 660	2 949	3 195	3 327	3 448	3 387	3 473
EXPENSES											
Operating and Administrative	536	518	501	511	513	524	536	548	559	571	583
Finance Expense	608	587	677	746	818	882	1 119	1 150	1 134	1 102	1 066
Finance Income	(17)	(17)	(21)	(29)	(35)	(33)	(40)	(21)	(25)	(27)	(20)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	739	752
Water Rentals and Assessments	131	130	120	110	113	117	127	128	131	131	131
Fuel and Power Purchased	132	124	140	158	165	156	140	135	138	127	129
Capital and Other Taxes	119	132	145	154	161	166	174	175	176	177	178
Other Expenses	60	116	109	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 995	2 150	2 656	2 393	2 508	2 826	2 901	2 914	2 899	2 902
Net Income before Net Movement in Reg. Deferral	(46)	13	92	(267)	267	440	369	426	534	488	571
Net Movement in Regulatory Deferral	66	72	115	473	82	78	59	50	50	51	55
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	85	207	206	350	518	428	476	584	540	626
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	94	208	203	345	509	418	465	581	537	622
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**94**	**208**	**203**	**345**	**509**	**418**	**465**	**581**	**537**	**622**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	85	207	206	350	518	428	476	584	540	626
* Additional Domestic Revenue											
Percent Increase		3.36%	7.64%	7.64%	7.64%	7.64%	7.64%	7.64%	4.54%	2.00%	2.00%
Cumulative Percent Increase		3.36%	11.26%	19.76%	28.90%	38.75%	49.35%	60.76%	68.06%	71.42%	74.85%
Financial Ratios											
Equity	16%	15%	14%	14%	15%	16%	17%	19%	21%	23%	25%
EBITDA Interest Coverage	1.51	1.54	1.70	1.71	1.83	1.99	2.00	2.05	2.18	2.20	2.32
Capital Coverage	1.53	1.40	1.47	1.45	1.85	2.30	2.19	2.32	2.29	2.15	2.24

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with Bowman Assumptions 25% Equity in 2026/27
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	1 252	1 322	1 394	1 470	1 556	1 648	1 742	1 841	1 945
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	662	677	697	709	705	701	696	694	602
Other	36	37	38	38	39	40	40	40	41
	3 550	3 650	3 759	3 864	3 974	4 089	4 207	4 332	4 373
EXPENSES									
Operating and Administrative	595	607	620	633	646	660	674	688	702
Finance Expense	1 047	1 030	1 004	930	878	835	783	711	646
Finance Income	(26)	(41)	(50)	(16)	(18)	(19)	(26)	(27)	(38)
Depreciation and Amortization	765	776	790	805	822	840	857	872	888
Water Rentals and Assessments	132	132	132	133	133	133	134	134	134
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	179	181	182	183	185	186	188	190	197
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	5	3	3	3	3	3	3
	2 910	2 910	2 909	2 906	2 867	2 858	2 838	2 809	2 761
Net Income before Net Movement in Reg. Deferral	640	740	850	959	1 107	1 231	1 369	1 523	1 612
Net Movement in Regulatory Deferral	57	61	67	69	72	75	76	76	75
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	697	800	917	1 028	1 179	1 306	1 444	1 599	1 687
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	693	795	909	1 018	1 168	1 293	1 430	1 584	1 671
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**693**	**795**	**909**	**1 018**	**1 168**	**1 293**	**1 430**	**1 584**	**1 671**
Non-controlling Interest	4	5	8	10	11	13	14	15	16
	697	800	917	1 028	1 179	1 306	1 444	1 599	1 687
* Additional Domestic Revenue									
Percent Increase	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Percent Increase	78.35%	81.91%	85.55%	89.26%	93.05%	96.91%	100.85%	104.86%	108.96%
Financial Ratios									
Equity	27%	30%	34%	37%	41%	46%	51%	56%	62%
EBITDA Interest Coverage	2.43	2.58	2.77	2.98	3.30	3.59	3.99	4.52	5.10
Capital Coverage	2.34	2.41	2.61	2.65	2.85	2.98	3.15	3.06	3.13

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim with Bowman Assumptions 25% Equity in 2026/27
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 168	30 504	31 034	31 670	32 334	32 945
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 705)	(4 328)	(4 942)	(5 607)	(6 212)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 043	26 799	26 706	26 727	26 727	26 732
Construction in Progress	7 079	9 471	6 745	7 522	8 012	3 836	367	454	418	414	411
Current and Other Assets	1 773	1 915	2 265	2 485	2 541	1 893	1 891	2 063	2 256	2 061	2 120
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 305	27 123	28 439	30 033	30 074	30 312	30 434	30 568	30 325	30 344
Regulatory Deferral Balance	462	534	649	1 121	1 204	1 281	1 340	1 390	1 440	1 491	1 546
	21 733	24 839	27 772	29 561	31 237	31 355	31 653	31 824	32 008	31 816	31 891
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 189	22 994	22 850	23 874	23 366	22 678	21 417	21 859
Current and Other Liabilities	3 204	3 643	3 046	3 816	4 358	4 144	3 023	3 177	3 458	3 979	2 978
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	346	266	186	106	27	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 842	3 050	3 253	3 598	4 107	4 525	4 990	5 571	6 108	6 730
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(497)	(449)	(370)	(369)	(368)	(368)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 790	27 723	29 512	31 188	31 306	31 604	31 775	31 960	31 767	31 842
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 839	27 772	29 561	31 237	31 355	31 653	31 824	32 008	31 816	31 891
Net Debt	15 427	18 473	20 747	22 420	23 323	23 658	23 469	22 951	22 368	21 832	21 219
Total Equity	2 856	3 163	3 509	3 765	4 135	4 649	4 751	5 290	5 885	6 436	7 073
Equity Ratio	16%	15%	14%	14%	15%	16%	17%	19%	21%	23%	25%

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim with Bowman Assumptions 25% Equity in 2026/27
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
ASSETS									
Plant in Service	33 553	34 299	34 958	35 790	36 566	37 361	38 104	38 907	39 975
Accumulated Depreciation	(6 906)	(7 603)	(8 311)	(9 040)	(9 788)	(10 577)	(11 366)	(12 168)	(12 975)
Net Plant in Service	26 647	26 696	26 647	26 749	26 778	26 785	26 739	26 739	26 999
Construction in Progress	493	454	490	400	374	366	406	461	257
Current and Other Assets	2 687	3 432	2 096	2 109	2 461	2 513	3 421	3 567	4 906
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	30 867	31 583	30 195	30 182	30 498	30 511	31 376	31 539	32 898
Regulatory Deferral Balance	1 603	1 664	1 731	1 800	1 871	1 947	2 022	2 098	2 174
	32 470	33 247	31 926	31 982	32 370	32 458	33 398	33 638	35 071
LIABILITIES AND EQUITY									
Long-Term Debt	21 791	19 414	15 121	16 381	15 545	15 570	14 680	14 259	14 143
Current and Other Liabilities	2 923	5 273	7 327	5 095	5 143	3 903	4 293	3 360	3 227
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	7 423	8 218	9 127	10 145	11 313	12 606	14 037	15 620	17 292
Accumulated Other Comprehensive Income	(368)	(368)	(368)	(368)	(368)	(368)	(368)	(368)	(368)
Total Liabilities and Equity before Regulatory Deferral	32 421	33 198	31 877	31 933	32 321	32 409	33 349	33 589	35 023
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	32 470	33 247	31 926	31 982	32 370	32 458	33 398	33 638	35 071
Net Debt	20 527	19 748	18 842	17 852	16 704	15 430	14 001	12 488	10 880
Total Equity	7 781	8 581	9 498	10 524	11 699	13 001	14 440	16 033	17 715
Equity Ratio	27%	30%	34%	37%	41%	46%	51%	56%	62%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with Bowman Assumptions 25% Equity in 2026/27
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 229	2 298	2 568	2 856	3 102	3 288	3 436	3 374	3 460
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(870)	(885)	(894)	(904)	(916)	(934)	(934)	(948)
Interest Paid	(553)	(531)	(635)	(700)	(762)	(835)	(1 068)	(1 122)	(1 111)	(1 083)	(1 047)
Interest Received	17	5	12	23	26	19	9	13	19	20	13
	810	734	762	751	946	1 146	1 139	1 263	1 409	1 377	1 477
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 160	2 190	990	1 360	(10)	(10)	(50)	590
Sinking Fund Withdrawals	146	0	0	120	318	813	182	46	339	140	234
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(240)	(251)	(255)	(247)	(244)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(10)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 661	908	73	172	(509)	(342)	(877)	(603)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 659)	(3 002)	(2 391)	(1 760)	(1 368)	(898)	(720)	(724)	(752)	(776)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 748)	(3 059)	(2 437)	(1 850)	(1 477)	(997)	(816)	(820)	(834)	(858)
Net Increase (Decrease) in Cash	(309)	(146)	69	(26)	5	(258)	314	(62)	247	(334)	16
Cash at Beginning of Year	943	634	488	558	532	536	279	593	531	778	444
Cash at End of Year	634	488	558	532	536	279	593	531	778	444	460

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with Bowman Assumptions 25% Equity in 2026/27
(In Millions of Dollars)

For the year ended March 31	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 536	3 637	3 745	3 850	3 960	4 075	4 192	4 318	4 359
Cash Paid to Suppliers and Employees	(963)	(979)	(996)	(1 019)	(1 015)	(1 028)	(1 049)	(1 073)	(1 083)
Interest Paid	(1 029)	(1 024)	(1 007)	(926)	(868)	(836)	(776)	(725)	(655)
Interest Received	23	46	56	18	13	22	29	37	49
	1 567	1 679	1 799	1 923	2 090	2 232	2 396	2 557	2 670
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	(10)	(10)	170	3 390	1 350	940	360	(100)	(30)
Sinking Fund Withdrawals	150	60	310	532	0	230	0	10	190
Sinking Fund Payment	(239)	(241)	(245)	(222)	(200)	(200)	(186)	(188)	(182)
Retirement of Long-Term Debt	(150)	(60)	(2 440)	(4 396)	(2 173)	(2 190)	(908)	(1 294)	(265)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(4)	(5)
	(254)	(256)	(2 210)	(701)	(1 028)	(1 227)	(739)	(1 577)	(291)
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(787)	(818)	(813)	(852)	(860)	(877)	(890)	(968)	(986)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(867)	(893)	(884)	(925)	(933)	(948)	(960)	(1 036)	(1 053)
Net Increase (Decrease) in Cash	446	530	(1 296)	298	129	58	698	(55)	1 325
Cash at Beginning of Year	460	906	1 436	140	438	567	624	1 322	1 267
Cash at End of Year	906	1 436	140	438	567	624	1 322	1 267	2 592

APPENDIX 3.2 - PUB/MH I-34-Attachment 2 Adjusted for Mr. Bowman's Assumptions

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with Bowman Assumptions at MH15 Rate Increases
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
REVENUES											
Domestic Revenue											
at approved rates	1 515	1 578	1 565	1 551	1 537	1 544	1 542	1 542	1 553	1 567	1 583
additional*	-	37	116	181	247	319	392	469	552	641	735
BPIII Reserve Account	(96)	(151)	3	79	79	79	79	26	-	-	-
Extraprovincial	460	514	469	420	567	693	779	788	805	667	671
Other	28	30	31	31	33	33	34	34	35	35	36
	1 907	2 008	2 184	2 263	2 463	2 670	2 826	2 859	2 944	2 909	3 024
EXPENSES											
Operating and Administrative	536	518	501	511	513	524	536	548	559	571	583
Finance Expense	608	587	677	749	829	905	1 156	1 202	1 204	1 201	1 214
Finance Income	(17)	(17)	(21)	(28)	(35)	(33)	(37)	(14)	(12)	(14)	(16)
Depreciation and Amortization	375	396	471	515	555	597	689	714	726	739	752
Water Rentals and Assessments	131	130	120	110	113	117	127	128	131	131	131
Fuel and Power Purchased	132	124	140	158	165	156	140	135	138	127	129
Capital and Other Taxes	119	132	145	154	161	166	174	175	176	177	177
Other Expenses	60	116	109	481	94	92	71	64	67	71	76
Corporate Allocation	8	8	8	8	8	8	8	8	8	8	8
	1 952	1 995	2 150	2 659	2 404	2 531	2 866	2 959	2 997	3 011	3 055
Net Income before Net Movement in Reg. Deferral	(46)	13	33	(396)	59	139	(39)	(100)	(53)	(102)	(30)
Net Movement in Regulatory Deferral	66	72	115	473	82	78	59	50	50	51	55
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Net Income	41	85	148	77	141	216	20	(50)	(3)	(51)	25
Net Income Attributable to:											
Manitoba Hydro before Non-recurring Item	33	94	149	74	136	207	10	(61)	(7)	(53)	21
Non-recurring Gain	20	-	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**53**	**94**	**149**	**74**	**136**	**207**	**10**	**(61)**	**(7)**	**(53)**	**21**
Non-controlling Interest	(12)	(8)	(1)	2	5	9	10	11	3	2	3
	41	85	148	77	141	216	20	(50)	(3)	(51)	25
* Additional Domestic Revenue											
Percent Increase		3.36%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%	3.95%
Cumulative Percent Increase		3.36%	7.44%	11.69%	16.10%	20.68%	25.45%	30.41%	35.56%	40.91%	46.48%
Financial Ratios											
Equity	16%	15%	14%	14%	14%	14%	13%	13%	13%	13%	13%
EBITDA Interest Coverage	1.51	1.54	1.64	1.59	1.64	1.72	1.62	1.57	1.62	1.60	1.66
Capital Coverage	1.53	1.40	1.36	1.20	1.45	1.70	1.41	1.36	1.34	1.23	1.34

ELECTRIC OPERATIONS
PROJECTED OPERATING STATEMENT
MH16 Update with Interim with Bowman Assumptions at MH15 Rate Increases
(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
REVENUES									
Domestic Revenue									
at approved rates	1 599	1 614	1 630	1 647	1 673	1 701	1 729	1 757	1 786
additional*	835	940	1 001	1 065	1 137	1 213	1 291	1 374	1 460
BPIII Reserve Account	-	-	-	-	-	-	-	-	-
Extraprovincial	662	677	697	709	705	701	696	694	602
Other	36	37	38	38	39	40	40	40	41
	3 133	3 269	3 366	3 460	3 555	3 654	3 756	3 865	3 889
EXPENSES									
Operating and Administrative	595	607	620	633	646	660	674	688	702
Finance Expense	1 219	1 213	1 201	1 216	1 200	1 198	1 183	1 156	1 125
Finance Income	(16)	(20)	(19)	(15)	(16)	(16)	(19)	(21)	(20)
Depreciation and Amortization	765	776	790	805	822	840	857	872	888
Water Rentals and Assessments	132	132	132	133	133	133	134	134	134
Fuel and Power Purchased	131	134	138	147	129	128	134	143	133
Capital and Other Taxes	179	180	181	183	184	186	188	189	196
Other Expenses	79	84	87	87	89	91	92	95	96
Corporate Allocation	8	8	5	3	3	3	3	3	3
	3 090	3 114	3 136	3 192	3 191	3 223	3 244	3 259	3 257
Net Income before Net Movement in Reg. Deferral	43	155	230	268	364	431	512	606	632
Net Movement in Regulatory Deferral	57	61	67	69	72	75	76	76	75
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Net Income	100	215	297	337	436	507	587	682	707
Net Income Attributable to:									
Manitoba Hydro before Non-recurring Item	96	210	289	327	425	494	573	667	691
Non-recurring Gain	-	-	-	-	-	-	-	-	-
Manitoba Hydro	**96**	**210**	**289**	**327**	**425**	**494**	**573**	**667**	**691**
Non-controlling Interest	4	5	8	10	11	13	14	15	16
	100	215	297	337	436	507	587	682	707
* Additional Domestic Revenue									
Percent Increase	3.95%	3.95%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Percent Increase	52.26%	58.28%	61.44%	64.67%	67.97%	71.33%	74.75%	78.25%	81.81%
Financial Ratios									
Equity	13%	14%	15%	16%	18%	20%	22%	24%	26%
EBITDA Interest Coverage	1.73	1.84	1.93	1.95	2.06	2.14	2.24	2.36	2.43
Capital Coverage	1.46	1.57	1.71	1.70	1.84	1.92	2.02	1.98	1.98

ELECTRIC OPERATIONS
PROJECTED BALANCE SHEET
MH16 Update with Interim with Bowman Assumptions at MH15 Rate Increases
(In Millions of Dollars)

For the year ended March 31	**ACTUAL 2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
ASSETS											
Plant in Service	13 065	13 679	19 062	19 684	20 747	26 168	30 504	31 034	31 670	32 334	32 945
Accumulated Depreciation	(972)	(1 301)	(1 731)	(2 178)	(2 616)	(3 125)	(3 705)	(4 328)	(4 942)	(5 607)	(6 212)
Net Plant in Service	12 093	12 378	17 332	17 506	18 131	23 043	26 799	26 706	26 727	26 727	26 732
Construction in Progress	7 079	9 471	6 745	7 522	8 012	3 836	367	454	418	414	411
Current and Other Assets	1 773	1 915	2 205	2 496	2 547	1 802	1 596	1 647	1 656	1 874	1 736
Goodwill and Intangible Assets	327	541	782	926	1 348	1 302	1 256	1 211	1 167	1 123	1 081
Total Assets before Regulatory Deferral	21 272	24 305	27 063	28 450	30 039	29 983	30 017	30 017	29 968	30 138	29 961
Regulatory Deferral Balance	462	534	649	1 121	1 204	1 281	1 340	1 390	1 440	1 491	1 546
	21 733	24 839	27 712	29 571	31 242	31 264	31 358	31 408	31 408	31 630	31 507
LIABILITIES AND EQUITY											
Long-Term Debt	15 725	18 141	21 376	22 389	23 394	23 450	24 668	24 547	24 259	23 998	24 840
Current and Other Liabilities	3 204	3 643	3 047	3 816	4 360	4 151	3 033	3 192	3 476	4 001	3 005
Provisions	70	50	49	48	46	45	43	42	41	40	39
Deferred Revenue	450	465	491	520	542	551	561	571	582	593	603
BPIII Reserve Account	196	347	344	265	185	106	26	(0)	(0)	(0)	(0)
Retained Earnings	2 749	2 842	2 992	3 066	3 202	3 409	3 419	3 358	3 352	3 299	3 320
Accumulated Other Comprehensive Income	(709)	(699)	(636)	(580)	(537)	(497)	(443)	(351)	(350)	(349)	(349)
Total Liabilities and Equity before Regulatory Deferral	21 684	24 790	27 663	29 523	31 194	31 215	31 309	31 359	31 359	31 581	31 458
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49	49	49
	21 733	24 839	27 712	29 571	31 242	31 264	31 358	31 408	31 408	31 630	31 507
Net Debt	15 427	18 473	20 806	22 609	23 717	24 349	24 558	24 548	24 549	24 600	24 584
Total Equity	2 856	3 163	3 449	3 577	3 739	3 951	3 651	3 677	3 685	3 646	3 682
Equity Ratio	16%	15%	14%	14%	14%	14%	13%	13%	13%	13%	13%

(In Millions of Dollars)

For the year ended March 31	2028	2029	2030	2031	2032	2033	2034	2035	2036
ASSETS									
Plant in Service	33 553	34 299	34 958	35 790	36 566	37 361	38 104	38 907	39 975
Accumulated Depreciation	(6 906)	(7 603)	(8 311)	(9 040)	(9 788)	(10 577)	(11 366)	(12 168)	(12 975)
Net Plant in Service	26 647	26 696	26 647	26 749	26 778	26 785	26 739	26 739	26 999
Construction in Progress	493	454	490	400	374	366	406	461	257
Current and Other Assets	2 113	2 476	2 121	2 047	2 463	2 522	2 982	3 427	4 184
Goodwill and Intangible Assets	1 040	1 001	962	924	885	848	810	773	736
Total Assets before Regulatory Deferral	30 293	30 627	30 220	30 120	30 500	30 520	30 937	31 400	32 177
Regulatory Deferral Balance	1 603	1 664	1 731	1 800	1 871	1 947	2 022	2 098	2 174
	31 896	32 292	31 951	31 920	32 371	32 466	32 959	33 498	34 350
LIABILITIES AND EQUITY									
Long-Term Debt	25 172	22 995	20 302	21 962	21 926	22 763	22 280	22 859	23 143
Current and Other Liabilities	2 956	5 310	7 365	5 338	5 392	4 146	4 539	3 822	3 688
Provisions	38	37	36	35	34	33	32	31	30
Deferred Revenue	615	624	634	644	654	665	676	687	699
BPIII Reserve Account	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Retained Earnings	3 416	3 626	3 915	4 242	4 666	5 160	5 733	6 400	7 091
Accumulated Other Comprehensive Income	(349)	(349)	(349)	(349)	(349)	(349)	(349)	(349)	(349)
Total Liabilities and Equity before Regulatory Deferral	31 847	32 243	31 902	31 871	32 323	32 418	32 911	33 449	34 301
Regulatory Deferral Balance	49	49	49	49	49	49	49	49	49
	31 896	32 292	31 951	31 920	32 371	32 466	32 959	33 498	34 350
Net Debt	24 482	24 285	23 998	23 695	23 283	22 803	22 234	21 628	21 002
Total Equity	3 792	4 007	4 304	4 639	5 072	5 574	6 156	6 832	7 533
Equity Ratio	13%	14%	15%	16%	18%	20%	22%	24%	26%

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with Bowman Assumptions at MH15 Rate Increases
(In Millions of Dollars)

For the year ended March 31	ACTUAL 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
OPERATING ACTIVITIES											
Cash Receipts from Customers	1 901	2 152	2 170	2 173	2 371	2 577	2 734	2 821	2 931	2 897	3 011
Cash Paid to Suppliers and Employees	(555)	(892)	(843)	(870)	(885)	(894)	(904)	(916)	(934)	(934)	(948)
Interest Paid	(553)	(531)	(635)	(704)	(771)	(853)	(1 102)	(1 170)	(1 178)	(1 178)	(1 191)
Interest Received	17	5	11	22	26	19	7	6	6	6	9
	810	734	703	621	741	849	735	741	825	791	881
FINANCING ACTIVITIES											
Proceeds from Long-Term Debt	2 166	3 468	3 600	2 360	2 390	1 190	1 560	390	390	950	990
Sinking Fund Withdrawals	146	0	0	120	318	813	182	52	348	153	250
Sinking Fund Payment	(146)	(182)	(222)	(260)	(296)	(353)	(246)	(259)	(268)	(264)	(271)
Retirement of Long-Term Debt	(320)	(407)	(1 002)	(349)	(1 293)	(1 366)	(1 141)	(290)	(412)	(715)	(1 178)
Other	(5)	(10)	(10)	(11)	(11)	(11)	11	(5)	(5)	(5)	(5)
	1 841	2 869	2 366	1 861	1 108	273	366	(111)	53	119	(213)
INVESTING ACTIVITIES											
Property, Plant and Equipment, net of contributions	(2 925)	(3 659)	(3 002)	(2 391)	(1 760)	(1 368)	(898)	(720)	(724)	(752)	(776)
Other	(35)	(89)	(57)	(46)	(89)	(109)	(99)	(96)	(96)	(82)	(81)
	(2 960)	(3 748)	(3 059)	(2 437)	(1 850)	(1 477)	(997)	(816)	(820)	(834)	(858)
Net Increase (Decrease) in Cash	(309)	(146)	10	44	(0)	(355)	104	(186)	59	76	(190)
Cash at Beginning of Year	943	634	488	498	543	542	188	292	106	165	240
Cash at End of Year	634	488	498	543	542	188	292	106	165	240	50

ELECTRIC OPERATIONS
PROJECTED CASH FLOW STATEMENT
MH16 Update with Interim with Bowman Assumptions at MH15 Rate Increases
(In Millions of Dollars)

For the year ended March 31

	2028	2029	2030	2031	2032	2033	2034	2035	2036
OPERATING ACTIVITIES									
Cash Receipts from Customers	3 120	3 255	3 352	3 446	3 540	3 640	3 741	3 851	3 874
Cash Paid to Suppliers and Employees	(963)	(979)	(996)	(1 019)	(1 015)	(1 028)	(1 049)	(1 073)	(1 083)
Interest Paid	(1 196)	(1 206)	(1 204)	(1 205)	(1 185)	(1 195)	(1 183)	(1 167)	(1 145)
Interest Received	14	27	27	15	12	23	27	39	41
	976	1 097	1 179	1 237	1 353	1 439	1 537	1 650	1 688
FINANCING ACTIVITIES									
Proceeds from Long-Term Debt	390	190	1 770	3 990	2 350	1 940	960	1 300	770
Sinking Fund Withdrawals	150	60	503	522	0	230	43	10	275
Sinking Fund Payment	(270)	(277)	(285)	(270)	(258)	(268)	(265)	(273)	(282)
Retirement of Long-Term Debt	(150)	(60)	(2 440)	(4 396)	(2 373)	(2 390)	(1 096)	(1 487)	(665)
Other	(5)	(5)	(5)	(5)	(5)	(7)	(4)	(4)	(5)
	115	(92)	(457)	(159)	(286)	(495)	(362)	(454)	94
INVESTING ACTIVITIES									
Property, Plant and Equipment, net of contributions	(787)	(818)	(813)	(852)	(860)	(877)	(890)	(968)	(986)
Other	(80)	(74)	(72)	(73)	(72)	(71)	(70)	(68)	(67)
	(867)	(893)	(884)	(925)	(933)	(948)	(960)	(1 036)	(1 053)
Net Increase (Decrease) in Cash	223	112	(163)	153	134	(4)	215	160	728
Cash at Beginning of Year	50	273	386	223	376	510	506	721	881
Cash at End of Year	273	386	223	376	510	506	721	881	1 610

ELECTRIC OPERATIONS (MH16 UPDATE WITH INTERIM AND MH15 RATE INCREASES)
WITH BOWMAN INELIGIBLE OVERHEAD AND ELG/ASL ASSUMPTIONS
CASH FLOW FROM OPERATIONS TO CAPITAL EXPENDITURES
(Millions of Dollars)

For the year ended March 31	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Net Income	94	149	74	136	207	10	(61)	(7)	(53)	21
CASH FLOW (DEFICIENCY)/SURPLUS:										
Cash Receipts from Customers	2 152	2 170	2 173	2 371	2 577	2 734	2 821	2 931	2 897	3 011
Cash Paid to Suppliers and Employees *	(892)	(843)	(870)	(885)	(894)	(904)	(916)	(934)	(934)	(948)
Interest Paid	(531)	(635)	(704)	(771)	(853)	(1 102)	(1 170)	(1 178)	(1 178)	(1 191)
Add: Total Capitalized Interest	(360)	(320)	(319)	(333)	(290)	(55)	(19)	(19)	(18)	(20)
Less: Capitalized Interest related to Keeyask, MMTP & GNTL	162	227	297	315	274	36	-	-	-	-
Interest Received	5	11	22	26	19	7	6	6	6	9
Adjusted Cash Flow from Operations **	**537**	**610**	**600**	**723**	**834**	**716**	**722**	**807**	**773**	**861**
CEF Expenditures ***	**688**	**709**	**689**	**674**	**652**	**638**	**643**	**703**	**732**	**756**
Cash Flow (Deficiency)/Surplus	**(151)**	**(99)**	**(89)**	**49**	**182**	**78**	**79**	**104**	**40**	**105**
Cumulative (Deficiency)/Surplus	**(151)**	**(250)**	**(339)**	**(290)**	**(108)**	**(30)**	**49**	**153**	**193**	**298**
OTHER NON-DISCRETIONARY CASH FLOW:										
Refund of Contributions	(5)	(5)	(5)	(5)	(18)	(15)	(16)	(16)	(16)	(16)
City of Winnipeg Obligation	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)
Liability Payments	(54)	(42)	(31)	(74)	(80)	(73)	(68)	(68)	(55)	(53)
Increase/(Decrease) to Surplus ****	**(75)**	**(62)**	**(52)**	**(95)**	**(114)**	**(104)**	**(100)**	**(100)**	**(87)**	**(86)**
Cash Flow (Deficiency)/Surplus	**(226)**	**(161)**	**(141)**	**(46)**	**68**	**(26)**	**(21)**	**3**	**(46)**	**19**
Cumulative (Deficiency)/Surplus	**(226)**	**(387)**	**(528)**	**(574)**	**(506)**	**(532)**	**(553)**	**(550)**	**(596)**	**(577)**

* Adjusted for payables associated with Bipole III and Keeyask
** CFO - Internally generated funds less portion of capitalized interest related to (Keeyask, MMTP & GNTL)
*** Total gross capital and deferred expenditures excluding Keeyask, Bipole III, MMTP & GNTL
**** From Other Financing Activities and Other Investing Activities in Projected Cash Flow Statement

APPENDIX 3.3 – PUB/MH I-34- Attachment 2 CFO to CAPEX

ELECTRIC OPERATIONS (MH16 UPDATE WITH INTERIM AND MH15 RATE INCREASES)
AS FILED IN PUB/MH I-34 ATTACHMENT 2
CASH FLOW FROM OPERATIONS TO CAPITAL EXPENDITURES
(Millions of Dollars)

For the year ended March 31	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Net Income	93	148	66	125	194	(6)	(158)	(105)	(151)	(76)
CASH FLOW (DEFICIENCY)/SURPLUS:										
Cash Receipts from Customers	2 152	2 170	2 173	2 371	2 577	2 734	2 821	2 931	2 897	3 011
Cash Paid to Suppliers and Employees *	(892)	(843)	(870)	(885)	(894)	(903)	(935)	(953)	(952)	(966)
Interest Paid	(531)	(635)	(704)	(771)	(853)	(1 102)	(1 170)	(1 178)	(1 178)	(1 191)
Add: Total Capitalized Interest	(360)	(320)	(319)	(333)	(290)	(55)	(19)	(19)	(18)	(20)
Less: Capitalized Interest related to Keeyask, MMTP & GNTL	162	227	297	315	274	36	-	-	-	-
Interest Received	5	11	22	26	19	7	6	6	6	9
Adjusted Cash Flow from Operations **	**537**	**611**	**600**	**723**	**834**	**716**	**703**	**788**	**755**	**843**
CEF Expenditures ***	**688**	**709**	**689**	**674**	**652**	**638**	**623**	**683**	**712**	**736**
Cash Flow (Deficiency)/Surplus	**(151)**	**(99)**	**(89)**	**49**	**182**	**78**	**80**	**105**	**42**	**108**
Cumulative (Deficiency)/Surplus	**(151)**	**(250)**	**(339)**	**(290)**	**(108)**	**(29)**	**51**	**155**	**198**	**305**
OTHER NON-DISCRETIONARY CASH FLOW:										
Refund of Contributions	(5)	(5)	(5)	(5)	(18)	(15)	(16)	(16)	(16)	(16)
City of Winnipeg Obligation	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)
Liability Payments	(54)	(42)	(31)	(74)	(80)	(73)	(68)	(68)	(55)	(53)
Increase/(Decrease) to Surplus ****	**(75)**	**(62)**	**(52)**	**(95)**	**(114)**	**(104)**	**(100)**	**(100)**	**(87)**	**(86)**
Cash Flow (Deficiency)/Surplus	**(226)**	**(161)**	**(141)**	**(45)**	**68**	**(26)**	**(20)**	**5**	**(45)**	**22**
Cumulative (Deficiency)/Surplus	**(226)**	**(387)**	**(528)**	**(573)**	**(505)**	**(531)**	**(552)**	**(547)**	**(592)**	**(570)**

* Adjusted for payables associated with Bipole III and Keeyask
** CFO - Internally generated funds less portion of capitalized interest related to (Keeyask, MMTP & GNTL)
*** Total gross capital and deferred expenditures excluding Keeyask, Bipole III, MMTP & GNTL
**** From Other Financing Activities and Other Investing Activities in Projected Cash Flow Statement

APPENDIX 7.1 – Additional Analysis Undertaken by Prairie Research Associates

Logit regressions

Table 1, taken directly from Appendix C of the PRA report, shows the estimated marginal effect coefficients and p-values for the independent variables included in the binary logit regression on whether a household is considered energy poor or not, where energy poor is defined as a household that falls below the LICO-125 (as defined by Manitoba Hydro's Affordable Energy Program) threshold and has an energy burden of 6% or higher (energy burden less than 6% = 0; energy burden equal to or more than 6% = 1). The significant variables at the 5% level are bolded in the table.

Table 1: Logit regression results – energy poverty (0 = not energy poor at 6%; 1 = energy poor at 6%)			
Variable	**Type**	**Marginal effect**	**P-value**
Square footage of home	Continuous variable	0.00001	0.538
Second structure on residence	Dummy (0/1) variable	-0.02	0.267
Household type is single detached	Dummy (0/1) variable	-0.007	0.880
Household type is townhouse	Dummy (0/1) variable	-0.03	0.312
Household type is apartment	Dummy (0/1) variable	-0.02	0.668
Number of people in the household	Continuous variable	0.01	0.144
EIA source paying for Hydro bill	Dummy (0/1) variable	0.07	0.334
Friends and family source paying for Hydro bill	Dummy (0/1) variable	-0.01	0.631
Other sources (e.g., Band Council, INAC) source paying for Hydro bill	Dummy (0/1) variable	0.004	0.956
Number employed in household	Continuous variable	**-0.07**	**0.001**
Married	Dummy (0/1) variable	-0.05	0.076
Divorced	Dummy (0/1) variable	0.04	0.256
Widowed	Dummy (0/1) variable	Dropped due to collinearity	
Employment as an income source	Dummy (0/1) variable	0.02	0.316
Investment as an income source	Dummy (0/1) variable	-0.02	0.175
Government transfers as an income source	Dummy (0/1) variable	0.07	0.150
Pension as an income source	Dummy (0/1) variable	0.04	0.166

Table 1: Logit regression results – energy poverty (0 = not energy poor at 6%; 1 = energy poor at 6%)			
Variable	**Type**	**Marginal effect**	**P-value**
Live in Winnipeg	Dummy (0/1) variable	-0.02	0.252
Live in Brandon	Dummy (0/1) variable	-0.01	0.558
Live in Northern Manitoba	Dummy (0/1) variable	Dropped – predicts failure perfectly	
		Sample:	**540**
		Pseudo R^2:	**0.1799**

The results in Table 1 can be interpreted as follows:

► For each increase in the number of people employed in the household (ranges from 0 to 2), the probability of the household being energy poor decreases by 7%, holding all other variables constant.

As suggested by Dr. Simpson on page 12 of his Energy Poverty in Manitoba and the Impact of the Proposed Hydro Rate Increase: An Assessment of the Bill Affordability Study in the Manitoba Hydro GRA paper, Table 2 shows the estimated marginal effect coefficients and p-values for the independent variables included in the binary logit regression on whether a household has an energy burden of 6% or higher, excluding the LICO-125 threshold as part of the development of this variable (energy burden less than 6% = 0; energy burden equal to or more than 6% = 1), and including income as a dependent variable.

Table 2: Logit regression results – 6% threshold (0 = less than 6% of income spent on hydro bill; 1 = 6% or more of income spent on hydro bill) including income as a dependent variable

Variable	Type	Marginal effect	P-value
Income	Continuous variable	-2.20×10^{-10}	0.624
Square footage of home	Continuous variable	2.38×10^{-9}	0.630
Second structure on residence	Dummy (0/1) variable	-2.00×10^{-9}	0.997
Household type is single detached	Dummy (0/1) variable	3.03×10^{-7}	0.810
Household type is townhouse	Dummy (0/1) variable	3.93×10^{-7}	0.894
Household type is apartment	Dummy (0/1) variable	-8.98×10^{-7}	0.648
Number of people in the household	Continuous variable	3.66×10^{-7}	0.629
EIA source paying for Hydro bill	Dummy (0/1) variable	1.47×10^{-6}	0.695
Friends and family source paying for Hydro bill	Dummy (0/1) variable	-8.36×10^{-7}	0.642
Other sources (e.g., Band Council, INAC) source paying for Hydro bill	Dummy (0/1) variable	1.00×10^{-6}	0.883
Number employed in household	Continuous variable	-3.30×10^{-7}	0.721
Married	Dummy (0/1) variable	5.07×10^{-7}	0.645
Divorced	Dummy (0/1) variable	3.35×10^{-6}	0.625
Widowed	Dummy (0/1) variable	Dropped due to collinearity	
Employment as an income source	Dummy (0/1) variable	9.44×10^{-7}	0.636
Investment as an income source	Dummy (0/1) variable	2.14×10^{-7}	0.815
Government transfers as an income source	Dummy (0/1) variable	-1.31×10^{-7}	0.827

Table 2: Logit regression results – 6% threshold (0 = less than 6% of income spent on hydro bill; 1 = 6% or more of income spent on hydro bill) including income as a dependent variable

Variable	Type	Marginal effect	P-value
Pension as an income source	Dummy (0/1) variable	4.95×10^{-7}	0.713
Live in Winnipeg	Dummy (0/1) variable	-5.52×10^{-7}	0.648
Live in Brandon	Dummy (0/1) variable	-5.27×10^{-7}	0.642
Live in Northern Manitoba	Dummy (0/1) variable	Dropped – predicts failure perfectly	
		Sample:	**540**
		Pseudo R^2:	**0.7047**

The results from this regression are not useful because of the endogeneity issue that exists between the independent variable of a household’s energy burden being below or above 6% and including the dependent variable of income (i.e., income is part of the calculation of the independent variable since energy burden is calculated as a household’s annual hydro bill as a proportion of their household income).

Dr. Simpson also suggests running the same regression at the 10% threshold, but since only 15 of the 549 households that would be included in the regression spend 10% or more of their income on their hydro bill, the regression did not provide useful results.

Table 3 shows a similar binary logit regression run as Table 2, but income was removed from the list of dependent variables. The significant variables at the 5% level are bolded in the table.

Table 3: Logit regression results – 6% threshold (0 = less than 6% of income spent on hydro bill; 1 = 6% or more of income spent on hydro bill) not including income as a dependent variable			
Variable	**Type**	**Marginal effect**	**P-value**
Square footage of home	Continuous variable	0.00003	0.182
Second structure on residence	Dummy (0/1) variable	-0.01	0.398
Household type is single detached	Dummy (0/1) variable	0.006	0.886
Household type is townhouse	Dummy (0/1) variable	-0.03	0.451
Household type is apartment	Dummy (0/1) variable	-0.009	0.846
Number of people in the household	Continuous variable	0.009	0.297
EIA source paying for Hydro bill	Dummy (0/1) variable	0.07	0.326
Friends and family source paying for Hydro bill	Dummy (0/1) variable	-0.02	0.493
Other sources (e.g., Band Council, INAC) source paying for Hydro bill	Dummy (0/1) variable	-0.0005	0.994
Number employed in household	Continuous variable	**-0.07**	**0.001**
Married	Dummy (0/1) variable	**-0.06**	**0.045**
Divorced	Dummy (0/1) variable	0.07	0.142
Widowed	Dummy (0/1) variable	Dropped due to collinearity	
Employment as an income source	Dummy (0/1) variable	0.02	0.309
Investment as an income source	Dummy (0/1) variable	**-0.03**	**0.041**
Government transfers as an income source	Dummy (0/1) variable	0.06	0.164
Pension as an income source	Dummy (0/1) variable	0.06	0.097

Table 3: Logit regression results – 6% threshold (0 = less than 6% of income spent on hydro bill; 1 = 6% or more of income spent on hydro bill) not including income as a dependent variable			
Variable	**Type**	**Marginal effect**	**P-value**
Live in Winnipeg	Dummy (0/1) variable	-0.03	0.112
Live in Brandon	Dummy (0/1) variable	-0.02	0.266
Live in Northern Manitoba	Dummy (0/1) variable	Dropped – predicts failure perfectly	
		Sample:	**540**
		Pseudo R^2:	**0.2001**

The results in Table 3 are similar to the results in Table 1 and do not provide much more information regarding the effects of household characteristics on whether a household spends less or more than 6% of their income on energy. The results in Table 3 can be interpreted as follows:

- For each increase in the number of people employed in the household (ranges from 0 to 2), the probability of the household spending 6% or more of their income on energy decreases by 7%, holding all other variables constant.
- If the respondent to the survey is married, the probability of the household spending 6% or more of their income on energy decreases by 6%, holding all other variables constant.
- If the household has one of its sources of income coming from investments, the probability of the household spending 6% or more of their income on energy decreases by 3%, holding all other variables constant.

As noted above, only 15 of the 549 households that would be included in the regression run spend 10% or more of their income on their hydro bill; and therefore, the regression did not provide useful results.

OLS regression – energy burden

Table 4 presents the coefficient and probability values (p-values) for each of the independent variables included in the OLS regression run on energy burden (percentage of income spent on energy). The significant variables at the 5% level are bolded in the table.

Table 4: OLS regression results – energy burden (percentage of income spent on energy)

Variable	Type	Marginal effect	P-value
Constant	constant	4.88	0.000
Square footage of home	Continuous variable	-0.0001	0.684
Second structure on residence	Dummy (0/1) variable	0.07	0.737
Household type is single detached	Dummy (0/1) variable	-0.10	0.887
Household type is townhouse	Dummy (0/1) variable	-0.81	0.353
Household type is apartment	Dummy (0/1) variable	-0.99	0.182
Number of people in the household	Continuous variable	0.18	0.094
EIA source paying for Hydro bill	Dummy (0/1) variable	0.64	0.238
Friends and family source paying for Hydro bill	Dummy (0/1) variable	-0.39	0.395
Other sources (e.g., Band Council, INAC) source paying for Hydro bill	Dummy (0/1) variable	-0.04	0.967
Number employed in household	Continuous variable	**-0.87**	**0.001**
Married	Dummy (0/1) variable	**-0.75**	**0.015**
Divorced	Dummy (0/1) variable	0.17	0.674
Widowed	Dummy (0/1) variable	Dropped due to collinearity	
Employment as an income source	Dummy (0/1) variable	-0.34	0.331

Table 4: OLS regression results – energy burden (percentage of income spent on energy)

Variable	Type	Marginal effect	P-value
Investment as an income source	Dummy (0/1) variable	-0.59	0.064
Government transfers as an income source	Dummy (0/1) variable	**0.91**	**0.011**
Pension as an income source	Dummy (0/1) variable	0.68	0.059
Live in Winnipeg	Dummy (0/1) variable	**-0.81**	**0.000**
Live in Brandon	Dummy (0/1) variable	**-0.93**	**0.018**
Live in Northern Manitoba	Dummy (0/1) variable	-0.82	0.302
		Sample:	**549**
		Adj. R^2:	**0.1933**

The results in Table 4 can be interpreted as follows:

► For every additional person employed in the household, the percentage of income spent on energy decreases by 0.87% holding all other variables constant.

► If the marital status of the residents of the household is married, the percentage of income spent on energy decreases by three-quarters of a percent holding all other variables constant.

► If a household has an income source coming from government transfers, the percentage of income spent on energy increases by 0.91% holding all other variables constant.

► If a household is located in Winnipeg, the percentage of income spent on energy decreases by 0.81% holding all other variables constant.

► If a household is located in Brandon, the percentage of income spent on energy decreases by 0.93% holding all other variables constant.

GMM regression – energy burden

Table 5 presents the coefficient and probability values (p-values) for each of the independent variables included in the Generalized Methods of Moments (GMM) models run to explain variation in energy burden (percentage of income spent on energy). GMM is a more general method than linear regression for estimating linear relationships between changes in a dependent variable (energy burden) and the possible causes (independent variables) of observed variation. Statistically significant coefficients appear in bold.

GMM helps correct for measurement errors in the set of independent variables, but it cannot compensate for the bias in the estimates when household income is included as a cause of energy burden. The only estimates that can be "trusted" in any of the statistical models are those that exclude income from the set of independent variables.

It is important to stress that the low reliability of these statistical models in no way affects the simulations of how increased Hydro rates will affect the energy burden experienced by Manitoba households. The simulations use no results from these statistical models.

Table 5: GMM regression results – energy burden (percentage of income spent on energy)

Variable	Type	Marginal effect	P-value
Constant	constant	5.52	0.000
Income	Continuous variable	**-0.00002**	**0.000**
Square footage of home	Continuous variable	0.0003	0.263
Second structure on residence	Dummy (0/1) variable	0.08	0.688
Household type is single detached	Dummy (0/1) variable	-0.16	0.685
Household type is townhouse	Dummy (0/1) variable	**-1.19**	**0.011**
Household type is apartment	Dummy (0/1) variable	**-1.03**	**0.032**
Number of people in the household	Continuous variable	0.17	0.107
EIA source paying for Hydro bill	Dummy (0/1) variable	0.43	0.383

Table 5: GMM regression results – energy burden (percentage of income spent on energy)			
Variable	**Type**	**Marginal effect**	**P-value**
Friends and family source paying for Hydro bill	Dummy (0/1) variable	**0.59**	**0.036**
Other sources (e.g., Band Council, INAC) source paying for Hydro bill	Dummy (0/1) variable	-0.21	0.712
Number employed in household	Continuous variable	**-0.45**	**0.035**
Married	Dummy (0/1) variable	**-0.58**	**0.048**
Divorced	Dummy (0/1) variable	-0.07	0.819
Widowed	Dummy (0/1) variable	Dropped due to collinearity	
Employment as an income source	Dummy (0/1) variable	-0.23	0.440
Investment as an income source	Dummy (0/1) variable	-0.38	0.290
Government transfers as an income source	Dummy (0/1) variable	0.46	0.146
Pension as an income source	Dummy (0/1) variable	0.41	0.186
Live in Winnipeg	Dummy (0/1) variable	**-0.72**	**0.000**
Live in Brandon	Dummy (0/1) variable	**-0.69**	**0.028**
Live in Northern Manitoba	Dummy (0/1) variable	-0.53	0.060
		Sample:	**549**
		Uncentered R^2:	**0.7441**

The results in Table 5 can be interpreted as follows:

- For every additional dollar of income a household makes, the percentage of that income spent on energy decreases by 0.00002% holding all other variables constant.

- If the household type is a townhouse, the percentage of income spent on energy decreases by 1.19% holding all other variables constant.

- If the household type is an apartment, the percentage of income spent on energy decreases by 1.03% holding all other variables constant.

- If a household is receiving help from friends or family to pay for their Hydro bill, the percentage of income spent on energy increases by 0.59% holding all other variables constant.

- For every additional person employed in the household, the percentage of income spent on energy decreases by 0.45% holding all other variables constant.

- If the marital status of the residents of the household is married, the percentage of income spent on energy decreases by 0.58% holding all other variables constant.

- If a household is located in Winnipeg, the percentage of income spent on energy decreases by 0.72% holding all other variables constant.

- If a household is located in Brandon, the percentage of income spent on energy decreases by 0.69% holding all other variables constant.

Summary

The various permutations to the model really shed little additional light on the determinants of energy burden. Because energy burden, whether measured directly or as a dichotomous, is defined using income, including a measure of income as a determinant creates a bias known as endogeneity, no simple statistical procedure is available to estimate the determinants of energy burden. Therefore, the original and supplementary analysis performed here are inconclusive.

It must be emphasized that this statistical analysis is not used in the analysis of how rate increases affect the energy burden of residential consumers under various income and inflation scenarios. That work is independent and stands on its own.