Pre-Filed Testimony of Patrick Bowman

In Regard to Efficiency Manitoba's Three-Year Energy Efficiency Plan (2020/21-2022/23) Application

Submitted to:

The Manitoba Public Utilities Board (PUB)

On behalf of:

Manitoba Industrial Power Users Group (MIPUG)

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InterGroup CONSULTANTS

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1.0 INTRODUCTION

This testimony has been prepared for the Manitoba Industrial Power Users Group ("MIPUG") by InterGroup Consultants Ltd. ("InterGroup") under the direction of Mr. Patrick Bowman. The qualifications of Mr. Bowman are provided in Appendix A.

This testimony complements another filing being made on behalf of MIPUG under the direction of Mr. Dale Friesen.

For this Pre-filed Testimony, InterGroup has been asked to review and evaluate Efficiency Manitoba's ("EM") first Efficiency Plan for the years April 1, 2020 to March 31, 2023 ("Plan" or "Three-Year Plan") submitted to the Public Utilities Board ("PUB" or "Board"). The Plan sets out the establishment of the new Crown Corporation and its approach to Demand Side Management ("DSM") in Manitoba over this timeframe. The MIPUG focus is largely on electric programs.

Efficiency Manitoba was developed as an outcome of Manitoba Hydro's Needs For and Alternatives To (NFAT) Review. The PUB's review of Hydro's proposed resource options resulted in recommendations including on Manitoba Hydro's approach to DSM, noting that:[1]

> Manitoba Hydro treats DSM as a reduction in load forecast demand, rather than as an alternative resource to meet demand projections. This approach was criticized by an independent expert and several Interveners. In their view, DSM should have the same status as generation sources, and be evaluated as such for planning purposes. The Panel shares that view.
>
> …
>
> A separate externally regulated entity is required to develop and implement energy efficiency measures and monitor their effectiveness. Such an entity should be subject to regular external audits to confirm DSM savings.

The Minister Responsible for Manitoba Hydro accepted the recommendation of the PUB and developed *the Efficiency Manitoba Act* (the "Act"), which sets out the powers of EM and the cumulative savings target requirements.

In 2019, the province developed the Efficiency Manitoba Regulations (Regulation 119/2019), which prescribes additional powers and much of the framework that Efficiency Manitoba followed in development of its three-year plan.[2]

For the purposes of this review, the PUB set a scope in its Procedural Order 162/19. This pre-filed testimony focuses on the regulation, mandate and approach undertaken by EM as well as the

[1] Public Utilities Board Report on the Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan, June 2014, pages 22 – 23 of 306, available online: http://www.pubmanitoba.ca/v1/nfat/pdf/finalreport_pdp.pdf.

[2] Efficiency Manitoba Regulation 119/2019, August 9, 2019. Available online: https://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=119/2019.

impacts and considerations for ratepayers. Based on the PUB's prescribed scope, this pre-filed testimony primarily addresses the following approved areas:[3]

> 2. Cost-effectiveness of electric and natural gas demand-side management program bundles and portfolio:
>
> > a. Reasonableness of methodology to evaluate cost-effectiveness
> >
> > d. Rate impact and customer bill impacts for both participants and non participants and whether the bill impacts are reasonable - limited to lifecycle revenue impact analysis (one-time equivalent change in rates)
>
> 7. Consideration of the demand-side management evaluation framework and plan proposed by Efficiency Manitoba
>
> 8. The mandate for Efficiency Manitoba's activities and recommendations to government regarding net savings targets

In preparations for the pre-filed testimony, EM's three-year plan was reviewed as well as the supporting regulation and provincial filings that preceded this review process. Information requests were reviewed to the extent possible as responses were filed as available by EM throughout the evidentiary preparation process.

1.1 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Efficiency Manitoba's proposed three-year plan sets out efficiency programming for electricity and natural gas with the sole focus of meeting its provincially set mandate and annual efficiency targets of 1.5% and 0.75% respectively. As a result, the summary and conclusions in this submission focus on three main focuses:

1. Efficiency Manitoba's Application (**Section 2**):
    - **RECOMMENDATION 1:** The PUB should find that the EM Plan as filed has not been justified in terms of need for the identified resources, nor as being cost-effective in light of alternatives to pursue lower levels of conservation. (**Section 2.2**)
2. Efficiency Manitoba Background and Policy Framework (**Section 3**):
    - **RECOMMENDATION 2:** The PUB should explicitly indicate that the EM plan is intended to be tested as part of a resource acquisition model, focused on cost-effectiveness in relation to other supply options (including differently sized conservation programs). (**Section 3.1**)
    - **RECOMMENDATION 3:** The PUB should ensure future EM filings are tested against the EM mandate, per section 4(1)(c) of the Act, including receipt of information that the EM plan will "mitigate the impact of rate increases and delay the point at which

[3] Specific sections as provided in PUB Order 162/19, Appendix A, pages 26 – 27 of 30.

capital investments in major new generation and transmission projects will be required by Manitoba Hydro to serve the needs of Manitobans." (**Section 3.1**)

- **RECOMMENDATION 4:** The PUB should ensure approvals from the current proceeding only address the scope and offerings for EM programming along with placeholder budgets. The approvals should be subject to revisions to EM's budgets coming out of a future Manitoba Hydro GRA, where resource options, supply needs, and marginal values can be tested in a model far closer to the intended Integrated Resource Plan ("IRP") than can be achieved in the current proceeding. (**Section 3.1**)
- **RECOMMENDATION 5:** Future three-year EM reviews should require appropriate IRP information, including testing of resource plans, supply options and marginal values. (**Section 3.1**)
- **RECOMMENDATION 6:** The PUB should recommend to Government that the various subsections of section 8(1) of the EM Regulations be amended to permit EM to recognize the savings arising from actions taken by all complementary agencies and government efforts, on a consolidated basis, regardless as to EM's specific and measurable contribution. (**Section 3.2**)
- **RECOMMENDATION 7:** The PUB should recommend to Government that section 8(1)(d) be clarified that all conservation or elasticity effects from general electricity price increases, changes to rate structures or rate designs be included in the calculation of the savings target. This could be achieved by a new subsection of 8(1) that reads: "the net elasticity effects of any overall rate change implemented by Manitoba Hydro that increases the price of power in Manitoba, regardless as to Efficiency Manitoba's participation in developing the rate proposal." (**Section 3.2**)
- **RECOMMENDATION 8:** Section 8 should be amended to add the following new subsection: "the participation of Efficiency Manitoba in providing advice, design, program or financial support to new or expanding commercial or industrial operations in Manitoba that lead to the adoption of more energy efficient facilities, processes or technologies than would otherwise have reasonably been expected to be adopted. (**Section 3.2**)
- **RECOMMENDATION 9:** Addition of a new subsection in section 9 which specifies that "For the purpose of implementing section 7(1) and 7(2) of the Act, the savings targets are to be achieved on average over the 15-year period following the commencement date, and need not be achieved in full in the efficiency plan for any specific year." (**Section 3.2**)
- **RECOMMENDATION 10:** The principle of resource acquisition underpinning Manitoba DSM should support the lowest cost supplies being pursued, regardless as to the class that provides the resource. (**Section 3.3**)

- **RECOMMENDATION 11:** The next time Hydro's COS study is updated, DSM costs should be functionalized to generation and transmission and distribution in proportion to the marginal values used to justify the programming, or approximately 75%, 10%, 15% respectively. (**Section 3.3**)

3. Ratepayer Impacts (**Section 4**):
    - **RECOMMENDATION 12**: Given the potential for a high-degree of rate impact in the first few 3-year EM programming cycles, consideration should be given to targeting well below 1.5% savings in the early years while marginal values for power are given time to increase. (**Section 4.1**)
    - **RECOMMENDATION 13:** For future EM reviews, the PUB should require that EM provide the impacts at a materially reduced and materially increased DSM scale for the three-year period in question (e.g., 0.5%, 1.0% and 2% for electricity) as sensitivities against the default plans EM produces. If this requires Manitoba Hydro to provide updated resource planning scenarios, including revised project in-service dates or revised dependable export scenarios as would be expected as part of IRP analysis, this should be included in EM's minimum filing requirements. (**Section 4.2**)

- Specific Programming Comments (**Section 5**):
    - **RECOMMENDATION 14:** the PUB should require EM to reallocate program expenses away from high cost residential programs for such items as Direct Install, Product Rebates and Home Renovation, and accept an annual savings reduction of less than 0.1% of load (from 1.5% down towards 1.4%). If the PUB determines there is no flexibility in the first three-year target setting period, and 1.5% should be achieved, the added savings should come from expended and enhanced offerings in programs with a lower levelized cost, regardless as to class. (**Section 5.0**)

2.0 OVERVIEW OF APPLICATION

Efficiency Manitoba's three-year plan was filed on October 25, 2019 after a delay from its initial October 1 filing date.

2.1 SUMMARY OF THE EM PLAN

EM's efficiency plan was developed consistent with the mandate as understood by EM, and provincial regulation, targeting 1.5% average annual savings over the years 2020/21 to 2022/23, as shown in the table below:[4]

2020/23 EFFICIENCY PLAN – ELECTRIC PORTFOLIO SAVINGS

	2020/21	2021/22	2022/23	Average
Annual electric savings (GWh)	373	403	403	393
Savings as a percent of electric load	1.43%	1.55%	1.56%	1.51%
Annual capacity savings (MW)	85	93	93	90

Note. Electric energy and capacity savings determined at generation.

EM's plan also includes average annual savings above the natural gas target of 0.75% per year. EM does not include cumulative savings in its target calculation but does include codes and standards, as shown in the table below:[5]

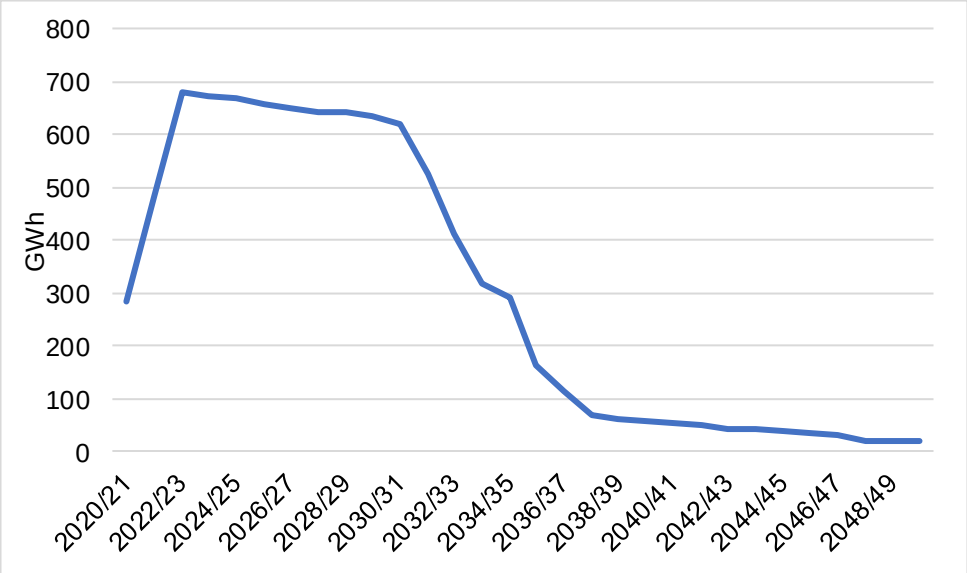
Electric forecast year	2019/20	2020/21	2021/22
2018 Electric Load Forecast (GWh)	26,237	26,528	26,759
Add: Cumulative 2018 Codes and Standards (GWh)	160	224	278
Less: 2019/20 DSM Plan (GWh)	350	350	350
Less: Cumulative Plan savings (GWh)	-	373	776
Reference electric load (GWh)	26,047	26,029	25,911
Table A2.1	2020/21	2021/22	2022/23
Reference electric load (GWh)	26,047	26,029	25,911
Target percent of load	1.5%	1.5%	1.5%
Electric energy savings required to achieve target (GWh)	391	390	389

Note: Total may not add up exactly due to rounding. Reference electric load and energy savings values are at generation.

Cumulative savings from activities other than codes and standards beginning in 2020/21 are shown in the figure below.

[4] EM Application, PDF page 17 of 591.
[5] PUB/MH I-45a.

Figure 1: Cumulative Electricity Savings from Three-Year Plan 2020/21 to 2022/23 – excluding Codes & Standards (GWh)[6]



Planned programming expenditures and forecast savings by customer category for EM's efficiency plan are shown in the table below (including codes and standards:[7]

	2020/21		2021/22		2022/23	
	Savings (GWh)	**Cost ($000)**	**Savings (GWh)**	**Cost ($000)**	**Savings (GWh)**	**Cost ($000)**
Industrial	146.26	$ 7,874	160.78	$ 12,077	156.4	$ 10,281
Agricultural	12.89	$ 1,990	11.81	$ 1,961	13.06	$ 2,170
Commercial	133.35	$ 17,619	137.84	$ 17,763	135.79	$ 17,494
Residential	76.58	$ 8,104	87.84	$ 9,388	93.15	$ 10,142
Indigenous	1.47	$ 1,029	2.10	$ 1,393	2.21	$ 1,515
Income Qualified	2.53	$ 1,188	2.70	$ 1,660	2.65	$ 1,637
Enabling Strategies		$ 4,897		$ 5,068		$ 4,854
Overhead		$ 1,844		$ 1,841		$ 2,889
Total	**373.07**	**$ 44,545**	**403.08**	**$ 51,151**	**403.26**	**$ 50,983**

[6] As provided in response to MIPUG/EM I-1e (Revised).
[7] MIPUG/EM I-6a, Figure A3.2 and A3.5.

2.2 COST EFFECTIVENESS OF THE EM PLAN

The EM plan assesses cost-effectiveness for the electricity initiatives in relation to *the Efficiency Manitoba Regulation* section 12(1) which states:

> 12(1) For the purpose of clause 11(d), the cost-effectiveness of the portfolio of electrical energy demand-side management initiatives included or under consideration to be included in an efficiency plan must be determined by comparing:
>
> (a) the levelized cost to Efficiency Manitoba of the electrical energy net savings resulting from those initiatives;
>
> with
>
> (b) the levelized marginal value to Manitoba Hydro of the net savings resulting from those initiatives, as determined by Manitoba Hydro based on a methodology consistent with its resource planning process, taking into account the timing and duration of the savings.

EM addresses cost effectiveness primarily through the Program Administrator Cost (PAC) test which is reported on both a ratio (benefits divided by costs), a Net Present Value (benefits minus costs) and a levelized unit cost (cost divided by energy). In each case, the default PAC measurement includes all relevant values in the long-term forecast of up to 30 years. Note that the PAC measurements are part of evaluation criteria aimed at the program administrator – they ignore the participant's own economics of participating.

A positive PAC test would generally mean the utility has acquired a long-term resource at a cost comparable to other alternative long-term resources as measured through marginal costs. The PAC test does not evaluate nor conclude that the resource should in fact be sought – it just concludes that were the resource to be sought, and the marginal values are accurate within the same range of resource size,[8] then DSM is a favourable option compared to alternatives.

EM also provides other relevant DSM evaluation statistics for information purposes, including the following:

- Total Resource Cost (TRC) which generally measures program cost effectiveness for the jurisdiction in total, with metrics similar to PAC except including the participants own costs.
- Rate Impact tests which generally measure the same impacts as the PAC, but also include the consideration of lost revenue to the utility. The rate impact tests are focused on the long-term effects of the plan on rates. There are multiple forms of the tests provided by EM, including a Rate Impact Measure (RIM) ratio, a RIM NPV, and a unit cost version termed Lifecycle Rate Impact (LRI). A weakness of the PAC test is that it can be highly positive even if the underlying program causes large rate increases, as long as the rate increases are not worse than would occur with an alternative resource acquisition. This is an issue

[8] Marginal values are developed based on the concept of adding or subtracting an increment of load to the system. These values are only accurate for load changes within the same general size of that increment.

when the justification for the resource acquisition has not been established. RIM related tests attempt to address this weakness.

- Participant tests, including the Participant Cost Test and Payback measurement. These tests indicate if uptake is likely by showing whether the participate will be better off by adopting the program or initiative (including any offsets or incentives provided by the utility).

On the basis of the overall plan, EM indicates a positive PAC test ratio of 3.27, a positive NPV of $345 million (real), and a levelized cost of acquisition of 2.24 cents/kWh (real).

Interestingly, EM also reports that even if the focus is only on the first five years, assuming all benefits that transcend this time-frame are ignored (while effectively all costs are included since almost all costs occur within the first three years), the PAC remains positive at 1.19, the NPV positive at $27 million, and the levelized cost at 5.5 cents/kWh.[9] This result is curious in that the latest reported marginal values for Manitoba Hydro (as shown in section 3.3 below) indicate a long-term marginal value for bulk power resources of only 4.39 cents/kWh,[10] and that is a value covering 30 years with an expected increase in value over the term. Based on a PAC test ratio of 1.19 and a PAC levelized cost of 5.5 cents/kWh, this would imply a short-term marginal value of acquired power of 6.55 cents/kWh being used by EM, which appears excessively high.

While the PAC results indicate positive effects, the LRI and RIM results are not as positive. In each case, the metrics show that rates will have to increase, in some cases materially, to fund the EM programs. At its core, this result can be interpreted as being indicative of unfortunate cross-subsidization – overall, all ratepayers will pay higher rates so that some ratepayers can save on bills. RIM results over 30 years indicate a ratio of only 0.9, with some programs as low as 0.57 and 0.49 (not counting special targeted programs for Indigenous). The results are more concerning in that RIM test results over shorter horizons are not provided, but will be much worse.

In all, there is no dispute that EM's programming will result in increases in rates. EM indicates this increase is *de minimus* by focusing on a 30 year levelized impact of only 0.019 cents/kWh.[11] However, this is an impact that is only of relevance if it is applied over 30 years to fund activities that occur over three years (even though programming will continue to be renewed or replaced in future three year increments). It also ignores the nature of utility accounting in that the highest cost impact will be in the initial years (when the cash spent will lead to added debt, interest, and amortization expense), while the highest benefits will be in the later years and are much more speculative for this reason. As set out later in this submission (Section 4.1), the early years impact could well be 10 times the value cited by EM, or more (with an over 3% rate impact for industrial customers). While the PAC test may indicate that this rate impact is no more than would be expected to secure a similar amount of power (979 GWh) the key unsupported assertion is that this 979 GWh is indeed needed for any identifiable purpose in the next few years.

[9] MIPUG/EM I-1r (Revised)
[10] PUB/MH II-57 (Revised) dated 2017-12-18 from the 2017/18 & 2018/19 GRA
[11] EM Application pdf page 139 of 591.

In a climate of energy surpluses, significant rate impacts from Keeyask coming on-line, and unjustified need, the imposition of the EM plan in full is neither required nor cost-effective.

> **RECOMMENDATION:** The PUB should find that the EM Plan as filed has not been justified in terms of need for the identified resources, nor as being cost-effective in light of alternatives to pursue lower levels of conservation.

In short, the EM plan as presented raises serious concerns and should not be accepted as filed. EM should further screen the projects for rate impacts focused on the near-term, and eliminate programs, or reduce the scale of programs, that indicate the least favourable impact on rates.

One additional consideration in terms of rate impacts – EM's programming does indicate a significant focus on industrial and commercial activities. This focus offers significant benefits that are not presently quantified in the EM materials, in that improving the energy efficiency of industrial operations can improve the competitiveness and the likelihood that a particular plant or operation will remain in operation or expand. In the current climate of energy surpluses (not to mention significant concerns over supporting rural development in Manitoba), the loss of an industrial customer would be an unfavourable impact on Hydro domestic revenues and on Manitoba. In short, while programming such as codes and standards, and most residential programs, have almost no effect of supporting load, the industrial and to some degree commercial programming can have this effect, to the benefit of overall system loads. For this reason, EM should be attentive to unquantified (and potentially unquantifiable) benefits to competitiveness when adjusting or enhancing industrial programming.

3.0 EFFICIENCY MANITOBA BACKGROUND AND POLICY FRAMEWORK

The current PUB review is the first opportunity to not only assess the design of the specific activities within the Efficiency Manitoba Three-Year Plan, but also to address:

1) Whether the plan activities collectively address the policy intent of Efficiency Manitoba, and good conservation programming in general.
2) Whether the activity of designing and reviewing the plan highlights weaknesses or improvements necessary in the Efficiency Manitoba Regulations, added Ministerial or Lieutenant-Governor-in-Council directives or regulations, and the Efficiency Manitoba legislation itself. These items are noted as being within the power of the PUB to make recommendation to Government.
3) Issues that arise that are not technically in scope for the current proceeding (e.g., issues that might apply to Manitoba Hydro, who is not an applicant, rather than Efficiency Manitoba) which can be the subject of PUB findings or directives tied to other future proceedings.

3.1 POLICY INTENT OF EFFICIENCY MANITOBA

Efficiency Manitoba was created as an outcome of the PUB review of Manitoba Hydro's Needs for and Alternatives To ("NFAT") proceeding and specifically the Final Report dated June 2014.[12] At the time, Manitoba Hydro had all responsibilities for conservation programming, consistent with the *Manitoba Hydro Act*, which provides in Section 2:

> 2. The purposes and objects of this Act are to provide for the continuance of a supply of power adequate for the needs of the province, and to engage in and to promote economy and efficiency in the development, generation, transmission, distribution, supply and end-use of power …

It is understood that promoting economy and efficiency in the end-use of power encompasses the operation of conservation programming.

The recommendations in the PUB report regarding conservation activities stemmed from a strong criticism of Manitoba Hydro's performance on conservation programming. The Board reviewed Manitoba Hydro's Preferred Development Plan and noted:

> By failing to offer an analysis of conservation measures as a stand-alone energy resource competitive with other generation resources, Manitoba Hydro presented

[12] Public Utilities Board Report on the Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan, June 2014, pages 22 – 23 of 306, available online: http://www.pubmanitoba.ca/v1/nfat/pdf/finalreport_pdp.pdf.

> an analysis of conservation measures that was neither complete, accurate, thorough, reasonable nor sound.[13]

The Board went on to note the following about IRP:

> Integrated resource planning is a regular practice in many jurisdictions. An integrated resource plan determines what supply side and demand side resource mix is in the best interest of electricity customers. The Panel heard evidence that the best practices for integrated resource planning involve placing every resource option on an equal footing and a public consultative planning process. In contrast, Manitoba Hydro prepares an annual Power Resource Plan that is not developed through a public integrated resource planning process.
>
> …
>
> The effectiveness of integrated resource planning in determining least-cost combinations of resources cannot be overestimated.[14]

The conclusion that led to the creation of Efficiency Manitoba was as follows:

> The Panel concludes that there is an inherent conflict in Manitoba Hydro being both a seller of electricity and a purveyor of energy efficiency measures. A separate externally regulated entity is required to develop and implement energy efficiency measures and monitor their effectiveness.[15]

Critical to the PUB conclusion was the need for DSM to be compared on an equal footing to other supply options, as follows:

> In its resource planning, Manitoba Hydro added DSM to each alternative plan it examined. By doing this, Manitoba Hydro effectively screened out DSM as an independent resource to be evaluated against other generation resources. [16]

Out of the PUB Report, the Government of Manitoba issued its conclusions and directions in a letter of July 2, 2014, as follows:

> The NFAT review has made a number of significant conclusions respecting Manitoba Hydro's assessment and delivery of DSM programming. Manitoba Hydro has a history of strong leadership in this area and the corporation's new 15-year Power Smart Plan represents a substantially enhanced commitment to DSM programming. Nonetheless, the PUB Panel has expressed concern about current long-term DSM planning, and about the way in which DSM is compared to supply side resources,

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[13] Public Utilities Board Report on the Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan, June 2014, page 33 of 306.
[14] Public Utilities Board Report on the Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan, June 2014, page 34 of 306.
[15] Public Utilities Board Report on the Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan, June 2014, page 22-23 of 306.
[16] Public Utilities Board Report on the Needs For and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan, June 2014, Page 92 of 306.

> concluding that a new independent DSM entity should be established. We accept the recommendation that a new DSM entity be established arm's length from Manitoba Hydro, and over the next few months we will investigate different organizational models to strengthen DSM and provide expenses opportunities for all Manitoban's to lower their hydro bills. Affordable electricity for Manitoba families and businesses must remain a central component of Manitoba's overall affordability advantage.[17]

In addition, the PUB conducted a review of Cost of Service in 2016 which noted the following in respect of conservation programming:

> The Board finds that DSM costs should be functionalized as 100% Generation. DSM should be classified with the other Generation assets based on system load factor, and allocated on Winter Coincident Peak for the Demand portion and unweighted energy for the Energy portion. The Board finds that DSM is a Generation resource: it avoids Generation costs, rather than the costs of Transmission and Distribution. Within the customer classes, there are non-participants in DSM programs which support this approach over Manitoba Hydro's direct assignment of the costs.[18]

The *Efficiency Manitoba Act* (the "Act") was passed by the legislature in response to the above sequence. The Act is one part of the Government of Manitoba's response to the PUB's NFAT report. That response included both a specified intent to implement IRP, and an intent to establish a new arm's length agency.[19] The Act makes specific reference to a "savings target"[20] that, at least at the outset, is fixed at a given value regardless as to the facts of the Resource Plan. There are two ways to consider the target:

1) The *Efficiency Manitoba Act* is a rejection of Integrated Resource Planning, and intends to achieve the cited 1.5%/year savings target notwithstanding any evidence received from time-to-time in regards to the appropriateness and cost effectiveness of the target; or,
2) the *Efficiency Manitoba Act* is intended to operate within an Integrated Resource Planning framework, and the target is simply a starting point that is intended to be adjusted to reflect the facts as they are updated.

On balance, it appears the second reading is appropriate, for the following reasons:

1) The Act and the concept of the independent agency were adopted at the same time as the concept of IRP was endorsed by the Minister.
2) The Act specifically notes that the intent is to achieve a cost-effective result, including sections 9(f) regarding the need to indicate the cost effectiveness of the plan, 11(4)(b) the requirement for the PUB to consider the cost-effectiveness of the plan, and 16(1)(b)

[17] MH Exhibit 45, Manitoba Hydro 2014/15 and 2015/16 GRA, page 5.
[18] PUB Order 164/16, page 85 of 116.
[19] Which was a result of the Minister of Crown Services 2016 Mandate letter from the Premier, dated May 3, 2016, page 2. Available online: https://www.gov.mb.ca/asset_library/en/executivecouncil/mandate/hon_ron_schuler.pdf
[20] Efficiency Manitoba Act, Part 3 – Savings Targets and Efficiency Plans, Section 7, available online: https://web2.gov.mb.ca/bills/41-2/b019e.php.

regarding the need to have an independent assessor confirm the cost-effectiveness of the plan as carried out. This is consistent with a resource acquisition model.

3) The Act specifically notes that the long-term purpose of Efficiency Manitoba is to achieve rate benefits for Manitobans, as per the Mandate section of the Act, section 4(1)(c): "The mandate of Efficiency Manitoba is to … mitigate the impact of rate increases and delay the point at which capital investments in major new generation and transmission projects will be required by Manitoba Hydro to serve the needs of Manitobans." At this time, there is no prospect of rate increases tied to future capital investment for bulk power that can be avoided.

4) The Act also specifically notes that Manitoba Hydro should be heard and make submissions on a review of an efficiency plan, presumably to reflect Hydro's knowledge and plans for future capital investment that could be deferred.

5) The explanatory notes to the Act when it was first introduced as Bill 19 specifically note: "In recognition of the benefits received by Manitoba Hydro from the efforts of Efficiency Manitoba, Manitoba Hydro is responsible for funding Efficiency Manitoba's operations."[21] The benefits to Manitoba Hydro clearly only arise to the extent that the DSM program being delivered is providing net benefits to the utility accounts, financial results and net revenues.

6) While the Act specifies a pre-determined value as the "savings target" in section 2, the Act also specifically notes that the target is not in practice fixed, as follows.[22]

    a. Section 4(2)(b)(i) notes that the agency should provide advice to the government and to Hydro regarding "…the appropriateness of the savings target…"

    b. Section 11(5)(b) provides that the PUB can recommend "a decrease in a savings target if it is reasonably satisfied that the existing savings target is not in the public interest".

    c. Section 38(1) notes that the Lieutenant Governor in Council may, by regulation, adjust the savings target.

In short, the above structure suggests that any savings plan from Efficiency Manitoba should be viewed from an IRP context. Where such benefits do not exist, or do not exist to the degree needed to support a 1.5%/year savings target, such a target should not be assumed to be the default level to pursue.

RECOMMENDATION: The PUB should explicitly indicate that the EM plan is intended to be tested as part of a resource acquisition model, focused on cost-effectiveness in relation to other supply options (including differently sized conservation programs).

RECOMMENDATION: The PUB should ensure future EM filings are tested against the EM mandate, per section 4(1)(c) of the Act, including receipt of information that the EM plan will "mitigate the impact of rate increases and delay the point at which capital investments

[21] Efficiency Manitoba Act, Bill 19, available online: https://web2.gov.mb.ca/bills/41-2/b019e.php.
[22] Efficiency Manitoba Act, Bill 19, available online: https://web2.gov.mb.ca/bills/41-2/b019e.php.

in major new generation and transmission projects will be required by Manitoba Hydro to serve the needs of Manitobans."

Notable from the development of EM's overall purpose and intent is that the EM agency was intended to develop DSM programming that operated in the fashion of an integrated resource plan. An IRP should consider what resources are required, when, and what supply options (including, but not limited to, DSM) best meet the resource need. The current proceeding is too narrow to provide information to conduct any type of IRP consideration. Instead, EM suggests that the Government of Manitoba has imposed the target without regard to any IRP concepts, and abandoned the key link between DSM and resource planning – which was the key criticism the PUB made of Hydro in the NFAT report. This is a significant flaw in the current process and should not be permitted to drive material spending commitments for the long-term.

RECOMMENDATION: The PUB should ensure approvals from the current proceeding only address the scope and offerings for EM programming, along with interim budgets subject to revision. The approvals should be subject to revisions to EM's budgets coming out of a future Manitoba Hydro GRA, where resource options, supply needs, and marginal values can be tested in a model far closer to the intended IRP than can be achieved in the current proceeding.

RECOMMENDATION: Future three-year EM reviews should require appropriate IRP information, including testing of resource plans, supply options and marginal values.

3.2 EFFICIENCY MANITOBA REGULATIONS

The Efficiency Manitoba Regulations[23] (the "Regulations") are the newest component of the EM policy framework. The regulations detail a number of aspects of the EM legislation as needed to implement the ultimate objective to achieve Integrated Resource Planning for Manitoba and to ensure electrical energy savings are achieved. Unfortunately, the regulations suffer from a number of significant weaknesses that must be addressed for the conservation achievements of Manitoba to be properly recorded.

First, the Regulations are **excessively limited to EM's participation**, as if conservation actions that are not presided over by EM are of little to no value. This is an inferior command-and-control model of conservation programming that is incorrect and excessively narrow, as well as impractical.

Take the example of Regulation section 8(1)(c). This section effectively provides that a code, standard or regulation may be successful in reducing electrical consumption in Manitoba, achieving the exact intent and purpose of the EM mandate, but unless EM itself actually helped make "a material contribution" to the development of the regulation, code or standard ("material" is not a defined term), the savings are irrelevant to Manitoba's conservation objectives. This makes little sense and is inconsistent with the idea of a vibrant multi-party complementary effort to achieve similar goals. Examples of savings that may be missed may include municipalities who pursue

[23] Efficiency Manitoba Regulations. 119/2019, August 9, 2019, available online: https://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=119/2019.

water savings activities that inherently also save energy, or actions by the federal government that benefit energy conservation.

On top of this section being an excessively narrow focus on EM's use of its own resources, the term is also likely impractical in that it is uncertain how one determines that EM's contribution to what may be provincial policy or national standards is "material".

The same constraint applies in section 8(1)(b)(i) where Manitoba Hydro's actions are not counted if EM has not included them in an EM plan, and 8(1)(b)(ii) where Hydro's actions are not counted if EM doesn't provide operational support to the initiative.

> **RECOMMENDATION:** The PUB should recommend to Government that the various subsections of section 8(1) of the EM Regulations be amended to permit EM to recognize the savings arising from actions taken by all complementary agencies and government efforts, on a consolidated basis, regardless as to EM's specific and measurable contribution.

Second, the Regulations poorly address **pricing and elasticity,** the most basic and effective conservation signal that exists. The presence of conservation programming is needed to achieve certain key objectives, including making conservation activities cost-effective for the participant (e.g., payback times). However, in an environment of increasing price, these incentives are not required to the same degree, if at all. The very same theoretical underpinning for effective conservation efforts through pricing, like carbon taxes or environmental handling fees, applies in the case of energy. That is, higher prices achieve conservation.

This pricing effect is why other jurisdictions such as British Columbia include conservation from elasticity effects as part of their DSM plans.[24] In the event Manitoba saw material price escalation from high rate changes, the actions towards conservation by customers would naturally increase. At the same time, the customer sensitivity to power costs would increase, and rate increases caused by conservation programming would be least easily absorbed by customers in this period. For this reason, inclusion of elasticity effects from all rate changes is clearly appropriate.

The Regulations at present appear to include elasticity effects but only under specific circumstances, as set out at Regulations section 8(1)(d). Namely, the conservation has to be from "a rate to which Efficiency Manitoba has made a material contribution." Outside of the obvious issue noted above (i.e., there is no reason to limit this to some unnecessary test as to whether EM specifically played a leading role), the limit that the savings must be from a "rate" is less than clear (i.e., is this limited to new rate designs?). There is no economic or rational basis that the savings have to come from a new rate design to be labelled as conservation, when savings from price increases retaining the existing rate design similarly have a clear and well-documented conservation effect. For this reason, it would be beneficial to clarify that any conservation effects from elasticity arising from changes to rates (including any general price increases, new rate designs, or changes to rate structures or classes) would be included under section 8(1)(d).

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[24] BC Hydro May 2012 Draft Integrated Resource Plan Appendix 5B; available online: https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning_regulatory/iep_ltap/2012q2/draft_2012_irp_appendix41.pdf

> **RECOMMENDATION:** The PUB should recommend to Government that section 8(1)(d) be clarified that all conservation or elasticity effects from general electricity price increases, changes to rate structures or rate designs be included in the calculation of the savings target. This could be achieved by a new subsection of 8(1) that reads: "the net elasticity effects of any overall rate change implemented by Manitoba Hydro that increases the price of power in Manitoba, regardless as to Efficiency Manitoba's participation in developing the rate proposal."

The proposed Regulation does not fully address **new industrial customers** including the positive economic growth that may increase energy consumption (i.e. particularly electric consumption) and in doing so provide positive benefit to the provincial economy. Efficiency Manitoba can support these efforts through providing programming that helps ensure conservation actions are implemented before any new baseline is established (i.e., to improve the new plant design before it ever goes into service). The Regulations are not clear that this form of savings would be included.

> **RECOMMENDATION:** Section 8 should be amended to add the following new subsection: "the participation of Efficiency Manitoba in providing advice, design, program or financial support to new or expanding commercial or industrial operations in Manitoba that lead to the adoption of more energy efficient facilities, processes or technologies than would otherwise have reasonably been expected to be adopted.

Note that despite the inclusion of these benefits in the Efficiency Manitoba savings, the additional energy consumed by these new facilities will still effectively create higher baselines for determination of future year savings targets, which could be a concern given the best opportunities for savings will have been largely already realized during their initial design and construction.

Efficiency Manitoba Three-Year Plans should be developed with a primary focus on the **long-term 15-year targets instead of annualized targets**. This will help develop the most cost-effective plan taking into consideration a long-term programming balance that may be best matched to the optimum timing of benefits. Additionally, it will help correctly identify and prioritize cost-effective industrial programs, which can often have very large one-year impacts that may appear a poor fit if the focus is too narrowly on achieving 1.5% or 0.75% in a given year.

> **RECOMMENDATION**: Addition of a new subsection in section 9 which specifies that "For the purpose of implementing section 7(1) and 7(2) of the Act, the savings targets are to be achieved on average over the 15-year period following the commencement date, and need not be achieved in full in the efficiency plan for any specific year."

Finally, a concern arises that EM's efficiency **economic plan metrics are excessively focused on the long-term**, such as Program Administrator Cost tests and Rate Impact Measure tests, which use long-term (up to 30 year) net present values in the calculation. EM has provided little to no information about the impacts on rates in the near- to medium-term. Such impacts include the costs of interest for debt incurred by Manitoba Hydro to make the annual payments to EM, the costs of amortizing the EM costs over whatever horizon may be used by Manitoba Hydro from time to time, and the impact of lost revenue by class. While this rate impact information was scoped

out of the PUB review in Order 162/19, it remains an item that EM should be able to track and report on as part of their mandate 4(1)(c).

3.3 OTHER CONCURRENT ISSUES BEYOND EM REVIEW

The limits of the current process mean that certain key EM issues will not be fully addressed in the current proceeding. However, it would appear there is room for the PUB to now address findings and recommendations towards related proceedings that will be implemented at a later date.

One item of note is the issue of cost allocation of DSM activities. The PUB has adopted a cost allocation approach in Manitoba Hydro's Cost of Service (COS) based on the premise that DSM activities are a generation resource, specifically:

> The Board finds that DSM is a Generation resource: it avoids Generation costs, rather than the costs of Transmission and Distribution.[25]

This finding reflects a contrast with the Manitoba Hydro status quo that was debated in 2016 which allocated DSM activities to the classes based on their participation. This reflected a logic put forward by Manitoba Hydro as follows:

> While DSM does free up domestic load that can then be sold to exports, this is not the purpose for which the DSM programs were instituted. Manitoba Hydro submits that, since DSM is not driven by export sales and benefits the domestic classes through reduced load and allocations, DSM costs should be assigned to the customer classes benefiting from the DSM programming.[26]

The PUB rejected this logic that DSM was a customer class focused activity and adopted the idea that it was a resource acquisition. The particular approach from the PUB indicates two main concerns.

First, the PUB's conclusion that DSM was a resource acquisition process means that the exercise should be driven by least cost planning. Under Hydro's previous approach, DSM activities could be distributed among the classes with a consideration of equity or sharing. If the costs to run programs for one class was low, and the cost for another class was much higher, there was no concern for inter-class fairness as each class paid its own costs. As a resource acquisition exercise, however, the focus is properly on the resource, not the source, similar to any Hydro procurement. This means that if there are a wide range of programs from one class included in the plan, and there remain additional potential programs affecting that class available at a low cost, while programs for other classes are only available at a higher cost, the lowest cost programs should be selected. Otherwise, the exercise of allocation becomes a blatant and uneconomic cross-subsidization – paying one class to participate when lower cost power is available from another source.

The competing perspective of a need for inter-class balance of rights to access EM programming is most easily supported when the costs are directly allocated by class (as was rejected in the COS

[25] Board Order 164/16, page 85.
[26] Board Order 164/16, page 83.

review) or the program RIM tests are favourable including in the short-term, This would mean that there is a negligible or positive overall rate impact from pursuing DSM (ideally in the short-term as well as the long-term). This means that non-participants are effectively not harmed or are aided as well as participants, and cross-subsidization is less likely to be a material concern. However, this is not the case today.

> **RECOMMENDATION:** The principle of resource acquisition underpinning Manitoba DSM should support the lowest cost supplies being pursued, regardless as to the class that provides the resource.

Second, the move to recognizing DSM as a resource acquisition benefit should now fully and properly be rooted in the scope of benefits provided to the system in terms of value. The EM evidence is clear – the value of DSM is spread across all 3 functions, generation, transmission and distribution. This this is highlighted in the response to Daymark/EM I-20a, which notes:

> Manitoba Hydro provides Efficiency Manitoba with a forecast of 30 years of generation, transmission and distribution marginal values. The generation marginal values for each year are broken out between marginal energy values and marginal capacity values that are then each differentiated between summer and winter seasons. Transmission marginal values are forecast on the basis of winter capacity for each of the 30 years. Distribution marginal values are also forecast on the basis of winter capacity for each of the 30 years.[27]

It is important to recognize as well that this blended marginal value is used by EM throughout the programming assessment. The current marginal values cited by EM are 7.33 cents/kWh[28] which is a combined generation, transmission and distribution benefit. However, this is not necessarily comparable to the marginal values previously cited by Hydro, as Hydro's marginal values were for a hypothetical defined load shape, while the EM values are for the specific load characteristics of the programs proposed, which would be expected to skew towards higher value periods. Nonetheless, it is helpful to note that the last publicly available Marginal Value from Manitoba Hydro appears to be the following table from the 2017/18 & 2018/19 GRA:[29]

[27] Daymark/EM I-20a
[28] Efficiency Manitoba Three-Year Plan, pdf page 134 of 591.
[29] PUB/MH II-57 (Revised) dated 2017-12-18 from the 2017/18 & 2018/19 GRA

30 Year Levelized Marginal Values

[cents/kWh]

	Used in 2016 DSM Plan		2017/18 Marginal Value in 2017 $	Change From 2015/16 to 2017/18
Components	2015/16 Marginal Value in 2016 $	2015/16 Marginal Value in 2017 $		
Generation	6.34	6.34	4.39	- 32%
Transmission	0.56	0.57	0.57	0.0%
Distribution	0.87	0.89	0.78	-12%
Total	7.77	7.94	5.75	-28%

Note that in respect of the 2017/18 values, only 76% of the marginal value came from avoided generation (which would include generation-linked transmission such as HVDC). The grid transmission marginal value made up a further 10% while distribution was responsible for the remaining 15%.

This means that Efficiency Manitoba's programs, contrary to the earlier PUB finding, are not only avoiding generation cost, they are also designed and justified specifically on the basis that they will avoid material transmission and distribution costs.

For this reason, the PUB should make findings in the current proceeding that the next time Hydro's COS study is updated, DSM costs should be functionalized to generation and transmission and distribution in proportion to the marginal values used to justify the programming.

> **RECOMMENDATION:** The next time Hydro's COS study is updated, DSM costs should be functionalized to generation and transmission and distribution in proportion to the marginal values used to justify the programming, or approximately 75%, 10%, 15% respectively.

A further support of the conclusion arises from the fact that Hydro's rates are blended and not distinguished by function (i.e., it is not possible to identify revenue from a low voltage customer such as residential as how much is being paid for distribution service versus transmission service, etc. unlike in many deregulated jurisdictions). Although the rates are not functionally identified, there is a functional nature to the rate composition, arising from COS study conclusions. When DSM leads to lost revenue, the effect is such that the distribution system loses more revenue than is likely justified by the cost savings, while the generation system is likely more balanced.

For example, PCOSS18 provided that residential costs per kWh were made up of the following components:

- Generation: 5.57 cents
- Transmission: 1.28 cents
- Export offset: 2.13 cents. For a net bulk power (Generation and Transmission) cost of 4.72 cents.
- Subtransmission 0.49 cents
- Distribution 2.38 cents

- Customer Service 0.97 cents
- Total Costs 8.56 cents
- Total Average Rate 8.00 cents – shortfall of 0.56 cents

If a residential kWh is saved through DSM, 8.00 cents of revenue is lost to the system. This may be replaced by some opportunity export revenue in the near term and some avoided import costs during droughts or avoided generation and transmission costs in the long-term, but as of 2017/18, the long-term levelized value of this was 4.96 cents[30]. While it is not directly comparable to look at current rates versus long-term term NPV, the values for generation and transmission are in a close relationship – lost revenue of somewhere on the order of 4.72 cents/kWh[31] for residentials, marginal value of 4.96 cents/kWh, and a small cost of programming to achieve the savings.

This compares to distribution however, where the residential rates pay on the order of 2.87 cents/kWh for distribution services while the marginal benefits are on the order of 0.78 cents/kWh and likely skew to the long-term from capital avoidance. In this case, the lost revenue is not matched by savings, and adverse rate impacts are possible. This is a natural consequence of low marginal cost functions and suggests the priority for properly tracking benefits and costs by function will be important to achieving fair allocated rates in future.

[30] Per PUB/MH II-57 (Revised) dated 2017-12-18 from the 2017/18 & 2018/19 GRA.
[31] 4.72 cents is the cost to service a kWh to residentials, however residentials underpay their costs by about 6.5%, so while the rate for generation and transmission cannot be specifically determined, it is only a small degree below covering costs, so the full costs have been used above as a proxy for the bulk power rate.

4.0 COST IMPACTS ON RATEPAYERS

EM's role is somewhat unique compared to many jurisdictions in North America. In the case of DSM justified by an IRP, the intent is that the utility defines a load that it needs to serve (either arising through load growth, retirement of existing generation, cancellation of contract purchases, etc.) and DSM is considered as one option to meet that load. In Manitoba, this is not the case - Manitoba Hydro has substantial committed supply coming on line with Keeyask in-service, well in excess of domestic load growth. Manitoba Hydro last forecast an energy surplus until around the year 2039/40 (with a capacity surplus until around the year 2040/41).[32] When a utility projects dates where next plant is needed that far into the future, these are typically highly sensitive to minor changes in assumptions of load growth or competing fuel costs, etc.

The effect of a general system surplus means that the marginal benefits of DSM are likely largely arising from changes in export transactions (or avoided imports or fuel costs during droughts), not from serving a new domestic load or avoiding capital costs. This type of "benefit" is an annualized cost profile, where the benefit is revenue booked in the year and the cost is the DSM operating costs, amortization of program costs and interest during the year. For this reason, it should be very easy for EM and Hydro to coordinate a presentation of annual effects of the EM plan, at least over the first 10 or so years. Unfortunately, this has not been provided.

For Manitoba Hydro ratepayers, DSM of the variety pursued by EM in the near future impacts customers in four ways:

1. The costs of EM's programming are ultimately recovered through rates. Manitoba Hydro amortizes the cost of DSM over ten years, so EM's annual program costs will have a 1/10 impact on costs in each year, added to existing DSM costs being amortized from previous years. Hydro applies these costs through a regulatory deferral account. Because these costs are amortized, there is also an interest component to the costs.
2. Reduced revenue from domestic ratepayers as a result of energy conservation. This varies depending on the class participating.
3. Increased export sales due to the freed-up energy from reduced domestic energy demand, or in the case of drought years, reduced market purchases and fuel costs to run Manitoba Hydro's own thermal generation.

4.1 ESTIMATED SHORT-TERM RATE IMPACTS

The information on the record in the EM proceeding is not enough to accurately assess the near-term cost and rate impacts that will result from EM's plan. The following coarse estimation of rate impacts in the short-term arises from the first three cost impacts listed above.

[32] PUB/MH II-45a-e – Attachment 1 in the 2017/18 and 2018/19 GRA, p. 19 of 26, the last time a resource plan was filed by Hydro.

In respect of annual impacts, as would be experienced through the Cost of Service analysis that Hydro performs, the following effects are noted:

1. **EM's costs** are on the order of $50 million per year. DSM costs are amortized over 10 years, such that by the end of the first 3 year period, EM's costs will be amortized into rates at approximately $15 million per year. At the same time, $150 million will have been spent by Hydro, less approximately $30 million that will have been amortized over years 1-3, for a net carried (borrowed) amount of $120 million. At the most recent debt rates available for Hydro (2.91%[33] plus 1% debt guarantee fee, for a total 3.91%) this would result in approximately $5 million in interest costs. Total annual impact of EM's activities at the end of year 3 is therefore approximately $20 million.
2. **Reduced revenue** arises from the cumulative lost sales for Hydro due to EM's activities. Per the EM application Attachment 3[34], the annual bill savings to customers (lost revenue to Hydro) is approximately $15 million from EM's activities each year. This excludes codes and standards, which makes up approximately one-quarter of the savings each year. Including codes and standards, the lost revenue approximates $20 million for each year of EM's operation, or approximately $60 million by the end of year 3.
3. **Increased Exports** arise from sale of the avoided consumption by Manitoba customers. EM indicates this cumulates to 680 GWh at MIPUG/EM I-1e (Revised) excluding codes and standards. Including codes and standards at 299 GWh[35] totals 979 GWh. Estimating export revenue is difficult with the information available, so for simplicity this analysis uses 4.39 cents/kWh, the last available generation marginal value[36]. Note that this is likely an overestimation as this is a levelized 30-year value, and it should be reasonably expected that the value climbs over the 30 years rather than falls. However, even with this conservatism, the export revenue totals only $43 million.

Combining the above, the annual impact at the end of year 3 totals $80 million in costs or lost revenue less $43 million in added export revenue, for a net negative impact on Hydro's Cost of Service of $37 million. On a domestic load of approximately 25 TWh, this is a negative impact of on the order of 0.17 cents/kWh, or approximately a 3-4% increase on the General Service Large classes.[37] Note that if the short-term export market assumption used above is high (as it is likely to be), this impact would be slightly larger. However, if proper functional analysis is undertaken, some of the lost revenue would impact the distribution system which GSL does not pay for, so the impact on GSL may be slightly smaller than calculated above.

Note that this near-term impact is significantly different than the Lifecycle Rate Impact ("LRI") calculated by Efficiency Manitoba, of 0.019 cents/kWh (slightly over 1/10 the impact calculated

[33] Order 69/19, page 10.
[34] Efficiency Manitoba Three-Year Plan, pdf page 517 of 591.
[35] Efficiency Manitoba Three-Year Plan, pdf page 513 of 591, cumulative over the three years.
[36] PUB/MH II-57 (Revised) dated 2017-12-18 from the 2017/18 & 2018/19 GRA.
[37] Based on current rates as of June 1, 2019 for GSL 30-100kV using approximately 50,000 kVa per year and load factor of 60% this would be equal to a 3.1% one-time rate increase. For GSL >100kV using 50,000 kVa per year and 90% load factor this would be equal to a 3.7% one-time rate increase.

above).[38] This is based on the present value of long-term program costs (including incentives paid out to customers to participate) plus the present value of lost revenues less the present value of any benefits, divided by the present value of total system energy, with the formula provided below.[39]

$$\text{LRI} = \frac{\text{PV (Program Costs+Incentives)+PV(Revenue loss)} - \text{(PV) Marginal Benefits}}{\text{PV (System Energy)}}$$

EM confirms that the LRI measure is not equivalent to the effective average rate increases needed by Manitoba Hydro or Centra in the year corresponding to the DSM Plan year in order to maintain their projected net incomes taking into account EM costs recovered from the utility.[40]

The programs that EM is proposing for its three-year plan results in the following LRI calculation:[41]

$$\text{LRI} = \frac{\$151 \text{ million} + \$434 \text{ million} - \$497 \text{ million}}{460{,}000 \text{ GWh}} = \$0.00019 / \text{kWh} = 0.019 \text{ ¢/kWh}$$

EM explains this 0.019 cents/kWh as a required electric rate increase in year 1 of the Plan, assuming no additional increases or decreases to this initial rate increase, that will provide the required net present value over a 30-year period to balance to the costs and benefits associated with the electric portfolio provided in the Plan.[42] This includes the present value of the program costs and incentives, which largely are spent in the three years of the plan. In other words, the EM analysis focuses on how to pay for three years of activity with 30 years of added rates – and it is not clear that financial impacts of debt interest or of future three-year plans have been considered.

The main reasons for the difference above cannot be confirmed with the data available (which does not allow granularity to the year-by-year values) but are expected to include:

1. EM uses long-term (up to 30 year) benefits, despite the costs being heavily front-loaded. This is likely the biggest factor.
2. EM uses marginal values that would include more than the generation export component, including transmission and distribution. This supports the conclusion that a portion of DSM costs should also be targeted to the distribution components of the COS study.
3. EM may not include codes and standards in the calculation, though without further data it is not clear whether this is the case.

Regardless, the above calculation highlights the importance of vigilance with respect to EM's activities. Long-term benefits from EM's programs may be valid and reasonably expected, but

[38] MIPUG/EM I-1(o) (Revised)
[39] As provided in response to MIPUG/EM I-1(o)
[40] PUB/EM I-21(a)
[41] MIPUG/EM I-1(o)
[42] PUB/EM I-21(b)

near-term rate impacts that could easily reach 3% or more for large industrials should be an acute concern. Where EM benefits can be secured by lower levels of EM activity in the early years and ramping up activity in later years of the 15 year horizon this should be considered (i.e., undertaking activities that achieve above 1.5% in the later years of the 15 year horizon, permitting the 1.5% average policy target to be achieved, assuming it remains cost-effective and not revised).

> **RECOMMENDATION:** Given the potential for a high-degree of rate impact in the first few 3-year EM programming cycles, consideration should be given to targeting well below 1.5% savings in the early years while marginal values for power are given time to increase.

4.2 MATERIAL STEP CHANGES IN CONSERVATION LEVELS

EM's focus in its three-year plan is not on balancing or minimizing adverse cost impacts *per se*, but on achieving the mandated targets. EM states in response to MIPUG/EM I-18a-c that if the targets are not met as a result of this three-year plan at the level of spending anticipated, this is viewed to require Efficiency Manitoba to spend more:

> In the event that Efficiency Manitoba actual energy savings resulting from independent evaluation have not achieved the targets set out within the Plan, the Efficiency Manitoba Act (Section 7(2)) indicates that shortfalls in annual net savings carry forward towards the achievement of the 15-year cumulative energy savings targets. In other words, in this scenario, Efficiency Manitoba would look to develop programming and offers to overcome any actual shortfalls within subsequent Efficiency Plans.

The issue of underachieving of anticipated savings in a climate of low export prices, and with material energy surpluses from bringing on Keeyask generation, was reviewed in the 2017/18 and 2018/19 GRA. At that time, Hydro indicated that a reduced level of DSM savings (even retaining the same level of spending) would actually result in a net rate benefit to ratepayers over the 15 year forecast period, as shown in the reproduced table below:[43]

[43] Filed as Minimum Filed Requirement PUB-MFR-77 in the 2017/18 and 2018/19 GRA

Figure 1. Incremental Increase/Decrease in Retained Earnings

	Incremental Increase/(Decrease) in Retained Earnings (in millions of dollars)			
	MH16	MFR77i	MFR77ii	MFR77iii
Fiscal Yr Ending	100% of proposed DSM investment 100% of expected savings	50% of proposed DSM investment 50% of expected savings	100% of proposed DSM investment 50% of expected savings	0% of proposed DSM investment 0% of expected savings
2019	3 083	4	4	7
2020	3 427	25	18	39
2021	3 921	64	42	123
2022	4 594	124	82	241
2023	5 094	196	125	385
2024	5 466	275	171	548
2025	5 898	363	222	731
2026	6 265	460	277	930
2027	6 705	572	340	1 157
2028	7 193	699	411	1 415
2029	7 759	836	486	1 694
2030	8 411	983	570	1 989
2031	9 138	1 150	667	2 316
2032	9 979	1 326	770	2 671
2033	10 929	1 506	876	3 035
2034	12 002	1 689	976	3 416
2035	13 200	1 879	1 081	3 803
2036	14 470	2 057	1 174	4 203

EM did not undertake sensitivity analysis of this type in its planning process. EM indicates it cannot undertake analysis of this nature in the time provided in response to information requests, and it may not be possible without recourse to Manitoba Hydro providing updated resource plan options (in the form of Integrated Resource Planning scenarios). While such work would be beneficial and advisable, and entirely consistent with the PUB's original intent for IRP, EM indicates that in the new environment no ratepayer benefit of this type could exist as, under EM's current mandate as it interprets the policy, it would be required to make up the savings losses in the future regardless of amount of expenditures undertaken.[44]

> **RECOMMENDATION:** For future EM reviews, the PUB should require that EM provide the impacts at a materially reduced and materially increased DSM scale for the three-year period in question (e.g., 0.5%, 1.0% and 2% for electricity) as sensitivities against the default plans EM produces. If this requires Manitoba Hydro to provide updated resource planning scenarios, including revised project in-service dates or revised dependable export

[44] MIPUG/EM I-18a-c

scenarios as would be expected as part of IRP analysis, this should be included in EM's minimum filing requirements.

5.0 SPECIFIC COMMENTS ON PROGRAMMING

The EM programming represents a portfolio approach covering all classes of ratepayers. Reviews of individual programs, the reasonableness of the proposals and further potential among specific classes, most notably industrial, are covered in concurrent evidence from MIPUG prepared by Dale Friesen.

At the portfolio level, the economics of the plan indicate generally positive metrics, with some concerning aspects. The overall portfolio is scheduled to meet the 1.5% target regardless as to the state of Hydro's surplus or export markets. This entails approximately 400 GWh of new or renewed programming in each year (per Attachment 3 – Technical Tables).

From a resource acquisition perspective, there are individual programs that should be noted to be of concern. These comments do not extend to programs targeted at Income Qualified or Indigenous which should be evaluated on metrics relevant to their relevant audience. Outside of these targeted programs, the general application programs include groups that are expensive, and those that are of low cost:

- Expensive programs exhibit levelized costs on the order of 3.5 cents/kWh or higher, such as Residential Direct Install, Residential Product Rebates and Residential Home Renovation.[45] These programs are not large, totalling less than 20 GWh (or about 5% of EM's programming)[46] but are costly at approximately 14% of all EM spending. Two of the programs exhibit low PACT ratios (1.53 for Direct Install and 1.74 for Product Rebates)[47] while the third (Home Renovation) exhibits a moderate long-term PACT only because there is a calculation of benefits from the program that appears well outside a reasonable range (10.65 cents/kWh,[48] which is not justified on its face given the last published levelized values only totalled 5.75 cents/kWh including transmission and distribution benefits[49]). Similar to PACT, the Direct Install and Product Rebate programs show concerning RIM values (0.57 per PUB/EM I-11 page 6) and the Home Renovation program only shows a marginal RIM value of 0.95, because of the oddly high marginal values.
- This compares to programs that exhibit high resource value, such as effectively the entire suite of commercial and industrial programs, at a levelized cost of 1.59 cents/kWh, or well below half the cost of the above residential programs. The commercial and industrial programs make up significant savings (approximately 260-270 GWh of the 400 GWh targeted by EM)[50] and the broad indications would be that further room may exist to secure added savings that are far more cost-effective than the residential programs noted above. For example, the Commercial Renovation program has EM spending 1.67 cents/kWh to

[45] EM Application, pdf page 516 of 591.
[46] EM Application, pdf page 513 of 591.
[47] EM Application, pdf page 516 of 591.
[48] PUB/EM I-11, page 2 of 11.
[49] PUB/MH II-57 (Revised) dated 2017-12-18 from the 2017/18 & 2018/19 GRA.
[50] EM Application, pdf page 513 of 591.

acquire resources,[51] but the program has been designed such that customers must still face a 2.17 year payback.[52] As a program with over 100 GWh of savings, it may not take much further effort to more than make up for uneconomic residential programs that may be not pursued, if the 1.4% target savings had to be maintained.

In support of the above comparison, EM produced a revised portfolio analysis if the three residential programs noted were terminated, in MIPUG/EM I-2h. The revised EM portfolio had a materially improved levelized cost overall of 2.12 cents/kWh compared to 2.24 cents/kWh for the EM plan as submitted, and a PACT ratio of 3.44 compared to 3.27 as submitted. The NPV of costs drops over $20 million, from $345 million to $322 million, while the loss of 5% of program savings means the portfolio still is expected to exceed savings of 1.4% of load for the three years, which can be easily made up in future years of the 15 year horizon, or by modest expansion of programs that have superior levelized cost profiles if it is determined that these savings must be met at all in the first 3 years.

The details of the above comparison are addressed in the MIPUG evidence of Dale Friesen.

RECOMMENDATION: the PUB should require EM to reallocate program expenses away from high cost residential programs for such items as Direct Install, Product Rebates and Home Renovation, and accept an annual savings reduction of less than 0.1% of load (from 1.5% down towards 1.4%). If the PUB determines there is no flexibility in the first three-year target setting period, and 1.5% should be achieved, the added savings should come from expended and enhanced offerings in programs with a lower levelized cost, regardless as to class.

[51] EM Application, pdf page 516 of 591.
[52] PUB/EM I-11 page 5 of 11.

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