PUB/MIPUG-1 Reference: Friesen Evidence PDF p.6, 40; Efficiency Plan p.513 of 591

Preamble:

PDF p. 6: "It should be noted that Load Displacement savings are re-earned in each fiscal year of the Plan and are not cumulative on a year-by-year basis like the other program offerings. The continuation of program savings is therefore somewhat dependent on a stream of performance-based incentives that extend through the estimated 15-year lifecycle of each self-generation project."

PDF p.40: "While additional large to medium load displacement opportunities exist, these projects represent large investments with longer lead times for planning, design and construction."

Technical tables to the Plan at page 513 show Load Displacement at 28% (29% with updates per PUB/EM-39R) of total average Plan savings.

Request:

a) Is it appropriate to count the energy savings from load displacement projects as "incremental" on account of incentives being paid annually, considering there are no incremental reductions in the load served by Manitoba Hydro?

b) Are the ongoing incentives for load displacement projects necessary for the industrial customers to continue operating the behind-the-meter generating facilities, or are the annual bill savings sufficient to justify the capital costs and ongoing operating costs of the facilities?

c) If Efficiency Manitoba adds additional medium or large load displacement projects, with the ongoing "re-earned" load displacement savings are counted as incremental savings towards the savings targets, is it a desirable situation that Efficiency Manitoba could meet the majority of its savings target with these load displacement savings and scale back its investments in other incentive programs? How should an extreme situation be addressed where the entire 1.5% savings target is met with "re-earned" load displacement savings?

Response:

(a)

Efficiency Manitoba's approach to calculating load displacement savings is appropriate given its approach to calculating mandated savings on an annualized basis of 1.5%, and in seeking to balance savings to expenditures (discussed further in PUB/MIPUG-1(b) below).

However, the likely more pertinent consideration is that of transparency and relative priority placed on achievement of annual savings versus cumulative.

The answer to that question requires agreement on the where the Act and Regulation are intended to specify achievement of savings targets on an annual basis (i.e. 1.5%) with cumulative savings being determined as the simple arithmetic sum of the annual savings, or whether achievement of the cumulative savings target (i.e. 22.5%) is a separate directive that requires a 22.5% reduction in the forecasted load at the conclusion of the 15 year mandate. Comment regarding this concern was also raised by Daymark in its Independent Expert report (at pages 118-119 & 129-131).

Consideration of the short-term (i.e. annual or three-year plans) versus long-term (15-year mandate) perspective influences how decisions are made regarding the achievement and aggregation of cumulative savings. Treating load displacement savings on an incremental basis with an annual lifecycle of one year directly influences the recording of cumulative savings, as illustrated by the information provided in the response to MIPUG/EM I-1e). The way savings are recorded has a direct impact on perceptions about the achievability of the 15-year cumulative savings target. Agreement among all stakeholders on this matter would resolve questions such as the one raised by this information request.

The question of appropriateness is impacted by the view held about the construct and importance of the cumulative 15-year target. It would be incorrect to suggest that the arithmetic sum of the annual savings of the initial Three-Year Plan equal to 4.54% (i.e. 1.43%, 1.55%, 1.56%) is the impact that will be felt in Year 15 of the mandate. Removing Codes & Standards savings from the targeted savings objective decreases these annual percentages to 1.09%, 1.15% and 1.14% respectively, for a total savings projection of about 3.38% at the conclusion of the initial Three-Year Plan. Using the information provided in MIPUG/EM I-1e) would suggest cumulative savings of 293 GWh at the end of Year 15 being the residual effect of the initial Three-Year Plan (i.e. without Codes and Standards). This reflects a cumulative impact of about 1.1% after 15 years.

These discussions also impact the financial treatment of incentives for programs that benefit from annual operating incentives, which extend well beyond the three-year window of the Plan. Incurring ongoing incentive costs for 14 years after the first year of implementation (i.e. 15-year life) without recognizing incremental savings in subsequent years raises questions as to how these costs will be addressed when Efficiency Manitoba’s cost-effectiveness is measured in the current and future three-year plans, as these annual costs will be perceived as adding no additional savings or value to the Plan in subsequent years if the are only counted in the first year of achievement.

As noted earlier, treating annual savings as incremental savings with a one-year lifecycle, and removing prior year savings from cumulative total savings, will place achievement of the 22.5% cumulative 15-year mandate in jeopardy based on the discussion outlined in the earlier paragraphs of this response. This in no way dilutes the contribution that load displacement project provides through persistent savings that extend over the long-term.

(b)

Considering a scenario where the annual bill savings are large enough to justify the capital costs and ongoing operating costs of these load displacement facilities would likely indicate that incentive support is unnecessary. This scenario is obviously not the reality for load displacement, otherwise projects such as these would be more prevalent in the marketplace.

The fact that these ongoing incentives were incorporated into negotiations between the customer and Manitoba Hydro (i.e. prior negotiations) & Efficiency Manitoba (i.e. future negotiations) demonstrates that they serve a necessary purpose for matching cash flow generated through bill savings and incentives to operating expenses for fuel, labour, maintenance, etc. Whether these ongoing costs relate to further capital improvements or annual operating costs is inconsequential to the cost justification if it is reasonably recognized that the savings stream will cease to exist without these activities.

Annual operating incentives recognize that the operating costs for load displacement projects can be substantial and ongoing. It also recognizes that failure to provide for these costs may jeopardize future savings, which is different than the perspective on operating costs for most other measures, where maintenance costs for example, are generally quite similar for both non-energy efficient and energy efficient equipment serving the same purpose, and therefore generally ignored.

Since the project benefits, initial capital costs and ongoing operating costs are ultimately evaluated on a Net Present Value basis, removal of annual operating incentives would require a corresponding and potentially large increase in initial capital incentive support to make the project viable. Annual operating incentives have the inherent capability to better match available annual revenues (i.e. bill savings and operating incentives) to costs (i.e. fuel acquisition and maintenance), as well as to efficiency savings, ensuring a sustainable project is maintained throughout its projected life.

The treatment of incentive support also has significant implications for Efficiency Manitoba's cashflow requirements. Providing annual operating incentives in lieu of higher upfront capital incentives that are indirectly supporting future operating costs balances Efficiency Manitoba's cash flow and reduces the probability of large year-over-year variations in funding requirements. Load displacements projects vary in their cost structure with some projects having a higher or lower proportion of capital costs to operating costs. In some cases, improvements are being made to existing facilities to facilitate the use of

(c)

The question appears to assume that the potential exists for load displacement projects to cost-effectively provide 400 GWh (i.e. 1.5% of reference base load) of electric savings on an annual basis. The cost-effectiveness of medium to large scale load displacement projects is highly dependent on a few established considerations:

a. That the industrial operation hosting the load displacement requires heat as a core input for its process or operation (i.e. beyond space heating requirements, which are seasonal). In most instances, co-generation of heat and power is necessary for a cost-effective load displacement project, with heat accounting for about 2/3's of the total energy delivery. If no value can be derived from the heat generated through power generation, it becomes progressively much more challenging to create a cost-effective load displacement project, and/or;

b. That a no-cost or low-cost energy-rich waste or by-product stream is readily and consistently available to serve as a fuel source for the load displacement project. A low-cost fuel source is an essential requirement for a cost-effective load displacement project to move forward.

It is not reasonable to assume that the conditions noted above exist on a substantive enough scale to entirely displace the need for other energy saving resources in Manitoba (i.e. to fully address the 1.5% target).

It is reasonable to suggest that a procurement strategy for energy savings as a resource for meeting the energy needs of Manitobans should focus on the lowest-cost options, considering the benefits available to Manitobans in the procurement and delivery of those resources.

PUB/MIPUG-2 Reference: Friesen Evidence, PDF p. 7 and 38

Preamble:

PDF p. 7: "The lifecycle methodology used by Efficiency Manitoba for determination of PACT levelized costs and PACT ratios masks this cost advantage to some degree by assuming shorter lifecycles for some industrial measures. It is quite uncommon for industrial users to replace end-of-life equipment with less efficient equipment due to the evolution of technology that naturally occurs during a product lifecycle. These end-of-life replacements are generally funded fully by the industrial user, providing continued savings at no incremental cost to the energy efficiency program administrator.

This is a limitation of Efficiency Manitoba's program selection methodology."

PDF p. 38: "While influenced by acquisition costs, levelized costs are highly dependent on the duration of product life cycle and subsequent costs for reinvestment to ensure continued savings after an energy efficient product reaches end-of-life. The lifecycle methodology adopted by Efficiency Manitoba (only looks at one lifecycle) for evaluating savings achieved under the Three-Year Plan limits the analysis to one product lifecycle with no consideration for reinvestment."

Request:

a) Is it Mr. Friesen's view that Efficiency Manitoba should modify the PACT as applied to all programs by recognizing the possibility of like-for-like replacement at end of life?

b) Please explain the approach to calculating the PACT that would take into account the persistence of measures, recognizing the possibility of like-for-like replacement at end of life.

Response:

(a)

It is Mr. Friesen's view that including multiple lifecycles in the assessment of a measure's value, while addressing considerations for re-investment costs, future codes and standards requirements, and other factors is reasonable and beneficial to a long-term view of energy efficiency and energy savings as a resource for meeting the energy needs of Manitobans.

Consideration of re-investment is an important component for establishing the long-term impact of an energy savings measure. The current approach adopted by Efficiency Manitoba, which uses a single-life cycle as the basis for determining value, makes the use of a 30-year assessment period largely inconsequential for most measures within the portfolio. As MIPUG/EM I-1e (revised) clearly illustrates, savings from the 3-Year Plan begin to drop of rather quickly after year 10, reducing to about half by year 15 and less than 10 percent by year 20. A review of the various program bundles shown in PUB/EM I-11a) demonstrates the large marginal value provided by the long measure life inherent to building renovations, such as insulation improvements.

The use of energy savings as a resource for meeting the long-term energy needs of Manitobans requires a long-term view, which is not necessarily well represented by the single life cycle approach to energy efficiency programming adopted by Efficiency Manitoba.

This shortcoming is not a function of the PACT, which simply assesses the NPV of costs and benefits over a defined assessment period, but rather a consequence of a single lifecycle approach, which does not address the potential for ongoing savings arising from measures that will benefit from low-cost re-investment after the first lifecycle has concluded.

As was noted in Mr. Friesen's evidence, the industrial sector generally replaces like with like, and will therefore not install a lesser efficient technology when equipment fails, unless the energy efficient measure has imposed serious consequences for production output or productivity, and no other energy efficient technology exists that can address the problem. This re-investment will not generally require additional incentive support as the costs for maintenance, repair or replacement are generally captured within operating budgets and efficiency benefits have been demonstrated to the customer.

(b)

As noted in a) above, the PACT itself does not requirement modification. The required change is to the methodology used by Efficiency Manitoba for obtaining a full 30-year stream of costs and benefits, rather than focusing on a more-short term view encapsulated by the single lifecycle approach used in the Plan.

This alternative long-term view should consider an assessment of the potential for re-investment as a means of extending savings, establishing costs to the program administrator for re-investment, including options for ensuring future re-investment such as codes and standards. To be clear, re-investment can come from the utility or the customer. In some cases, energy efficiency programming will have helped to accelerate the maturity of a technology, increasing its availability and reducing costs for consumers to the point, where replacement will be a natural occurrence when re-investment is required. The benefits of programming in supporting this development should be recognized even if they are challenging to quantify.

If savings achieved through re-investment becomes a core component of Efficiency Manitoba's future three-year strategies, it will become progressively more difficult to achieve the cumulative target of 22.5% savings over the 15 year mandate, as these future initiatives will only replace savings that are being deducted due to the life cycle expiration of savings achieved in prior plans. Considering multiple lifecycles in Efficiency Manitoba's planning methodology has the added benefit of directing Efficiency Manitoba's future strategies towards more long-term and sustainable efficiency programming.

PUB/MIPUG-3 Reference: Friesen Evidence, PDF p. 7 and 10

Preamble:

PDF p. 6: “Emerging Technologies appear to be an area of opportunity for industrial programming.”

PDF p. 7: “Given its 15-year mandate and the aggressive overall targets included in the Plan, Efficiency Manitoba should pursue a potential study during the three-year duration of the Plan. A comprehensive potential study should examine cost-effectiveness measures, assessed for energy savings potential.”

PDF p. 10: “The most recent Potential Study completed for the Manitoba market was undertaken by Manitoba Hydro in 2012. It is understood that Efficiency Manitoba made use of this potential study in its preparation of the Plan, but also recognizes that an updated study will provide key information needed to support a sustainable and economic energy efficiency plan.”

Request:

a) In updating the Potential Study, would Mr. Friesen recommend any revisions to the approach taken with the Potential Study undertaken by Manitoba Hydro in 2012? Please explain the rationale for any changes.

b) Please identify any significant developments in the Industrial sector that should be specifically addressed in an updated potential study.

Response:

(a)

The basic approach and methodology for undertaking potential studies is well established and referenced in well-recognized documents.[1]

Existing technologies mature over time and new technologies emerge that fundamentally change consumer behavior pertaining to the use and consumption of energy. Key examples of these changes include, electrification driven by productivity and climate change considerations, the emergence of distributed energy resources, such as solar PV and energy storage, the move towards electric vehicles, smart devices and homes, etc. Variants of these technological shifts impact industry as well, so potential studies must examine these changes when considering opportunities for energy efficiency in the industrial sector.

An updated potential study examining future energy savings opportunities in Manitoba should first and foremost address the dominant use of energy for space heating in our cold climate. At the time of the last Manitoba Potential Study (2010 – 2012 time period), obtaining adequate

[1] Guide for Conducting Energy Efficiency Potential Studies, US EPA, https://www.epa.gov/sites/production/files/2015-08/documents/potential_guide_0.pdf

recognition for the impact of our cold climate and the resulting heating interactive effects related to energy efficiency improvements proved to be. Recognition for Manitoba's industrial sector composition and the relative opportunities that each sector provided was also challenging when energy efficiency potential was examined. A potential review of the industrial sector should be sensitive to the relative opportunities and challenges present within each sub-sector relevant to Manitoba.

An updated potential study should also examine the impact of electrification on both electricity and natural gas consumption, and in doing so, evaluate the impact of climate change initiatives and regulatory impacts that are influencing consumer and industry behavior. These findings will also serve as important inputs for marginal value studies that examine future demand for energy and resources available to supply Manitoba's energy needs. It should also address the emergence of trends in distributed energy resources, that are being driven by a focus on de-carbonization, de-centralization and digitization of the energy supply chain. Many of these distributed resources are located behind-the-meter and therefore impact load projections contained within load forecasts.

(b)

Future industrial load will be driven by changes in demand for the commodities and products produced by industry as well as changes in the technologies used within each industry to produce and delivery their products. These changes are being driven by climate change initiatives, changing consumer behavior, environmental regulations, etc. As a result, some industry sectors may become more or less relevant to the future demand for energy in the Province.

The competitiveness of large process-driven industries is often tied closely to raw material supply and costs for energy, labour and transportation. Significant changes in costs for raw materials or energy on both a local and global basis will impact the viability of industry in Manitoba. The productivity of industry (i.e. kWh or m^3 per unit of production) supported by reasonable and predictable energy rates is an important indicator of the competitiveness of industry in Manitoba relative to its national and international competitors. A change in the relative competitive position of Manitoba industry will have an impact on energy consumed by the industrial sector. More efficient industrial processes may increase total energy consumption, which most would consider to be a positive outcome. This consideration is not reflected in the Efficiency Manitoba Act or Regulation.

A few examples related to technological changes include:

- The mining industry is progressing rapidly with innovations that support the electrification of underground mining equipment, which will create large electric loads for operations that current consume minimal electricity.
- The transportation sector is integral to the industrial sector and the movement of goods, and it is expected that carbon taxes and the electrification of transportation will change

both the costs and composition of energy required for moving goods and commodities. Regulation for the transfer of some manufactured goods also has cost implications.

- Rapid evolution in the use of data and the energy demand created by server farms and computing centres are growing. While there is often a focus on massive technological server farms, most industries are increasing their use of data, and smaller but still energy intensive data centres are being incorporated into many commercial and industrial facilities.
- Energy intensive processes are continually evolving with each new generation of industrial facilities (automation, robotics, etc.). Aging facilities must compete with newer, more productive and efficient facilities. Given the long-life of processes in industry, it is important that new facilities or major expansions consider the most efficient technologies available when process systems are selected.

Potential Studies can be used to identify rapid and constant change in the energy sector, which is often timely with limited windows to address in a cost-effective manner. Potential studies should be used to examine future energy use, opportunities for energy efficiency improvements and the impacts of these opportunities. Failure to do so, raises the concern that future changes to industry and the factors that determine energy consumption will be ignored or missed.

PUB/MIPUG-4 Reference: Friesen Evidence, PDF pages 7, 20 and 21

Preamble:

PDF p. 7: "The timing and flexibility of industrial energy efficiency programming delivery is important for the effective implementation of industrial programs. Opportunities should not be passed by due to strict adherence to mandated targets."

PDF p. 20: "The timeline for implementing process-related improvements is often dictated by factors unrelated to energy efficiency."

PDF p. 21: "Achieving this state of readiness requires Efficiency Manitoba to have the necessary flexibility and freedom to match its investment to the timing and need of industry. A long-term view of the savings cycle would enable Efficiency Manitoba to shift funding between fiscal budgets and capture opportunities that may drive savings levels higher than the targeted 1.5% and 0.75% of load criteria entrenched in the Efficiency Manitoba regulation."

Request:

a) Efficiency Manitoba has stated that it has the ability to deviate from the approved Efficiency Plan in order to improve results. Please explain why this flexibility is insufficient to address Mr. Friesen's concern.

b) Please explain why Mr. Friesen does not consider Efficiency Manitoba's three-year planning cycle to be sufficient to address this concern and how additional flexibility could be provided. For example, would it be necessary to focus on the aggregate target over the three year planning cycle rather than the year-by-year targets?

c) Is Mr. Friesen aware of situations where Manitoba Hydro was constrained in its industrial DSM spending, such that energy efficiency opportunities with industrial customers were missed? If so, provide generalized information explaining these situations.

Response:

(a)

The scale of larger industrial projects with potential to deliver significant savings potential can easily overwhelm Efficiency Manitoba's resource budget and three-year contingency fund. Plant expansions and major process improvements, sometimes over $50-100 million in cost, require extensive engagement from the earliest stages of conceptualization through design, construction and commissioning.

Energy savings projects of this magnitude create a lumpy cost and savings profile, where costs and savings may deviate materially from specified budgets and annual savings targets. There appears to be an inherent assumption within the Plan that spending will align with savings in the year of achievement. This view is not a reality for many large industrial projects. Industry cannot necessarily be expected to carry the full incremental costs for a two or three-year project and wait for reimbursement until the year that savings are delivered.

Given the emphasis on annual savings targets in the Efficiency Manitoba Plan, it is not readily apparent how flexible Efficiency Manitoba can be in responding to projects that may shift annual budget spending significantly and potentially draw heavily on contingency funding, which is not included in the metrics that evaluate the overall cost-effectiveness of the portfolio.

(b)

The focus on annual budgets and savings targets is challenging for the reasons outlined in part a) of this response.

Major projects requiring longer planning cycles will not always align with the timing of a three-year plan, whether the budget and target is aggregated or not. Aggregating targets without aggregating budgets does not create strong alignment between the recognition for savings and evaluation of annual cost-effectiveness. Reconciling spending related to a three-year project commencing in years 2 or 3 of a three-year plan when the savings will be delivered in year 1 of the following three-year plan can be challenging in both 1-year and 3-year aggregated scenarios, but it is likely that aggregation would provide some benefits for flexibility given the likelihood that program results and spending will be evaluated by the PUB on a three-year interval.

Maximizing the return on energy efficiency spending does however require a consistent, long-term view of both spending and recognition of savings. The industrial sector values stability and predictability in energy pricing and energy efficiency programming. Plans that focus on a 3-year cycle with a short-term emphasis on annual targets may not provide the assurance that funding will be available for when project with longer planning and implementation cycles are initiated. As a result, efficiency improvements may not be considered at this early stage, leading to greater difficulty for introducing those priorities later in the project.

(c)

Manitoba Hydro has had the benefit of an active and engaged Key and Major Account management team, which was closely tied to the Corporation’s Economic Development staff when dealing with the industrial sector. This was the case during much of the time that the Crown Utility actively delivered Power Smart programming targeting the industrial sector.

Industrial customers, particularly those with large energy requirements, generally made the utility aware of major projects as they generally impacted energy service requirements. Given the long lead-times required to ensure delivery of energy service, conversations often began at the concept stage of a project. As a result, Manitoba Hydro became aware of many projects at an early stage and was therefore granted the opportunity to mobilize resources for targeting these large industrial projects.

Even given this opportunity, Manitoba Hydro was not always able to commit the resources and incentives required to support larger opportunities. The timeliness of decision-making in respect to large incentive expenditures and corporate sensitivity to large budget variances and resulting impacts on borrowing requirements and energy rates created obstacles that led customers to move on with their projects and bypass opportunities for energy efficiency. Maximum incentive caps were also a limiting factor in some instances, with available incentive funding unable to match the incentive requirements for larger more costly projects. The maximum incentive caps were sometimes used to "spread the opportunity" and prevent larger projects from monopolizing fixed annual program budgets, concern that could impact the Efficiency Manitoba Plan as well. This spending cap approach can however increase overall savings acquisition costs by limiting opportunities for acquisition of cost-effective savings.

(d)

In some instances, Manitoba Hydro was however able to acquire substantial savings from non-load displacement projects, including single projects that provided electric savings equivalent to more than 15% of Efficiency Manitoba's annual savings target.

The financial requirements for projects of this magnitude can easily exceed the Three-Year Contingency established by Efficiency Manitoba in its Plan. Discussions surrounding demand-side management investments of this magnitude are always challenging, whether they occur at Manitoba Hydro or Efficiency Manitoba because of their visibility, sensitivity towards sector specific spending and impact on budget projections.

Perhaps the greatest challenge faced by Manitoba Hydro, which will also be a challenge for Efficiency Manitoba, is the fact that much of the work supporting the design of new industrial facilities or major expansions is performed and managed by personnel located outside of Manitoba. As a result, these individuals were often unaware of available incentives to offset the incremental costs of energy efficiency improvements until design and equipment selection has been largely completed. Engagement occurring after this stage is often too late for fundamental changes to be implemented. Project managers are also hesitant to take on the risk of engaging in a process that may not provide adequate resources and funding for projects with tight timelines, high costs, and large risks or consequences for failure to meet in-service dates.

PUB/MIPUG-5 Reference: Friesen Evidence, PDF page 21 and 22

Preamble:

PDF p. 21: "Efficiency Manitoba's approach to caps that limit incentive contributions to a fixed percentage of project costs or minimum payback criteria without considering acquisition costs can artificially limit program participation and negatively impact the achievement of broader program objectives for achievement of savings and cost-effectiveness targets.

Acquisition costs should be a key consideration for driving energy savings targets."

PDF p. 22: "The most significant and cost-effective opportunities for acquisition of industrial energy efficiency savings often occur during the design and construction of a new industrial facility or major upgrade/expansion to an existing facility."

Request:

a) Please explain why Efficiency Manitoba's approach that uses minimum payback criteria (how long it takes for customer to recover its investment) or fixed percentage of project costs (customer pays the residual percentage not funded by Efficiency Manitoba) fails to take into account the acquisition costs.

b) Please explain the alternate approach to caps that Mr. Friesen considers appropriate.

c) What restrictions would be required to ensure that Efficiency Manitoba's costs do not exceed those contained in the approved Efficiency Plan and that the benefits by customer segment are also achieved?

d) How can Efficiency Manitoba address the concern that "The most significant and cost-effective opportunities for acquisition of industrial energy efficiency savings often occur during the design and construction of a new industrial facility or major upgrade/expansion to an existing facility"? In particular, how should Efficiency Manitoba ensure that it is engaged in the design and construction of industrial facilities?

Response:

(a)

As a point of clarification, the evidence provided by Mr. Friesen was intended to highlight that the process for establishing incentive caps may not adequately consider how the benefits and costs for acquisition of energy savings by Efficiency Manitoba can be influenced by alternate incentive structures that increase adoption of low-cost measures. Additionally, an overemphasis on shorter-term paybacks, efficiency targets and returns may undervalue long-term measures that can be highly cost-effective.

Capping incentive support at 50% of project costs can limit the industrial sector's ability to implement cost-effective projects even when these projects appear cost-effective from an outside perspective (i.e. payback periods of less than two years). Capital constraints, production related-spending and other priorities may limit the capacity and appetite for energy efficiency projects even when these projects appear cost-effective.

As noted in the response to PUB/MIPUG-10, energy efficiency is often not a priority item when production is top-of-mind and capital funding is constrained. Artificially imposed incentive caps may therefore limit the ability of some industries to deliver cost-effective savings for Efficiency Manitoba. Available incentive funding may not cover a large enough portion of the overall capital costs to move the project forward under these circumstances. As a result, Efficiency Manitoba loses the long-term benefit of savings that may be cost-effective even if 75% or 100% of incremental costs were covered with incentives.

(b)

The guiding principles for acquisition of savings by Efficiency Manitoba should align more closely with the cost-effectiveness of savings acquisition, rather than a prescribed focus on percentage share of project costs. This alternative decision-making process is not necessarily supported by the PACT, which focuses on Program Administrator costs without transparently considering whether incentive caps may be limiting participation and the associated acquisition of cost-effective savings. Higher incentives that allow for greater participation while maintaining favourable cost-effective savings metrics for lower-cost measures should be considered under all circumstances. This alternative approach is not a consideration exclusive to industrial programming. If increasing incentives levels for lower-cost measures allows for greater participation by industry, it would appear reasonable to assume that this action will benefit the overall portfolio and reduce the overall costs for achieving mandated savings targets, benefitting all ratepayers.

(c)

If savings opportunities with lower Total Resource Costs are available to achieve the savings targets prescribed by Efficiency Manitoba in the Plan, and increasing incentives for supporting the acquisition of those savings can be shown to increase participation while remaining favourably cost-effective relative to other available measures, than Efficiency Manitoba's overall costs for achieving the targeted savings should not increase over the amounts specified in the Plan.

The marginal benefits available to Manitoba Hydro and its ratepayers through lower infrastructure costs and increased export revenues are important to all customer segments. The value of these marginal benefits decreases when acquisition costs funded by Manitoba Hydro increase. Incentive structures that increase participation for cost-effective measures and have lower overall acquisition costs will invariably provide a stronger ratio of benefits to costs that benefit all customer segments, including both participants and non-participants.

(d)

It is well established that the savings obtained during initial design and construction are generally more substantive and cost-effective than those acquired through subsequent retrofits undertaken specifically for the purpose of obtaining energy efficiency improvements. Under this scenario, energy efficiency is a secondary benefit that adds to the value of a project taken for other primary purposes.

These cost-reductions are achieved because the expense associated with the removal of existing equipment and installation of new equipment are not incremental to the savings project since they will already be incurred to achieve the original intent of the project. The costs for removal (i.e. in the case of a project driven by other considerations such as a process upgrade) and installation are incurred whether the newly installed equipment has a high or low efficiency. In general, incremental costs for installing energy efficient equipment are small, particularly during new construction, expansion or major process refurbishments. This realization does not represent a concern, but rather identifies an opportunity to acquire savings in a more cost-effective manner. The concern rests on whether Efficiency Manitoba can capture these opportunities when they arise.

As noted in responses to PUB/MIPUG-2 and PUB/MIPUG-10, engagement at the earliest stages of concept and design for new facilities or facility expansions is critical for achieving success in capturing these cost-effective savings opportunities. Being a small market, key decision-makers for large industries are often located in other provinces or countries, making them difficult to access at these early stages. This is a challenge that can only be overcome with strong outreach and education about the opportunities available in Manitoba for industry.

PUB/MIPUG-6 Reference: Friesen Evidence, PDF page 29; PUB/EM-13(a),(c)

Preamble:

PDF p.29: "Cost impacts for consumers (i.e. energy ratepayers), acting either as participants or non-participants in energy efficiency programming, are sometimes over-looked when cost-effectiveness tests are selected and applied. Restricting the use of cost-effectiveness tests in this manner may result in a primary focus on program administrator costs, which can be detrimental to a more complete understanding of why customers participate in energy efficiency programming and what factors encourage or discourage their participation. The end-result of cost-based focus may be an apparent cost-effective program that is unable to achieve its savings objectives due to limited participation."

PUB/EM I-13: "Efficiency Manitoba used the Program Administrator Cost Test (PACT) to screen DSM measures and develop the portfolio. This was the sole cost-effectiveness test used as it is prescribed by the Efficiency Manitoba Act.

… The Efficiency Manitoba Regulation (Section 11d and Section 12) has prescribed the PACT as the cost-effectiveness test that should be applied at the portfolio level. In considering the mandated electric and natural gas targets, applying additional non-prescribed cost-effectiveness screens to eliminate or reduce programming to customer segments may restrict Efficiency Manitoba's ability to satisfy the energy savings targets or to provide equitable and accessible programming."

Request:

Please provide Mr. Friesen's view on whether and how the Total Resource Cost (TRC) and Societal Cost Test (SCT) could be used by Efficiency Manitoba either instead of or in addition to the PACT.

Response:

The PACT provides a useful understanding of the ratio between the marginal benefits derived from deferral of utility infrastructure costs, or other benefits such as increased export sales, and program administrator costs for program delivery, management and incentive support costs. In the case of Efficiency Manitoba, the difference between these benefits and costs are passed on to ratepayers, who experience a net benefit when benefits exceed costs and a net cost when costs exceed benefits. A derivative of the PACT test, the Levelized PACT Cost (i.e. Levelized Utility Cost) provides an understanding of savings acquisition costs for the program administrator.

The TRC test attempts to provide a useful understanding of the ratio between the marginal benefits and other measurable benefits obtained by the consumer, such as water savings, and the total program administrator costs for program delivery, management and incentive support costs, combined with the incremental measure costs incurred by the consumer (i.e. direct customer investment). A derivative of the TRC test, the Levelized Resource Cost (LRC) provides an understanding of total savings acquisition costs for both the program administrator and program participant.

Broadly speaking, the difference between the LRC and LUC tests provides an understanding of the required investment that must be made by the consumer for adoption of the measure, which is neither illustrated nor recognized by the PACT. The incremental investment made by the consumer is a key factor, along with bill reductions for evaluating customer payback, or return, on the investment. If the return experienced by the consumer does not meet their criteria for justifying the incremental expenditure, it is highly unlikely that the consumer will participate in the program. In many cases, returns on energy efficiency projects are considered as non-core projects, making them subject to higher thresholds than core projects related to production expenditures. This is discussed more in response to PUB/MIPUG (Friesen)-10.

Efficiency Manitoba's Three-Year Plan does not reference the required investment by the customer, nor specify how the level of direct consumer investment was considered in establishing appropriate incentive levels or determination of participation levels. DAYMARK/EM I-13de – Attachment and the revised response to MIPUG/EM I-1h provides some insight into the share of total incremental costs covered by Efficiency Manitoba incentives.

The TRC test provides a more customer-centric view of benefits and costs, which combined with the PACT test indicates the level of direct spending required by customers to achieve Efficiency Manitoba's savings targets. This is not readily apparent in the Application. A cursory examination of PUB/EM I-11a indicates the NPV TRC cost of $251 million against a NPV PACT cost of $152 million, while also indicating a NPV TRC benefit of $518 million against a NPV PACT benefit of $497 million. This comparison indicates a need for about $100 million NPV in non-supported direct customer investment for achievement of the savings targets outlined in the Plan ($251 million less $152 million), providing a net incremental benefit to consumers of about $20 million NPV ($518 million less $497 million).

The question arises as to how Efficiency Manitoba has determined consumer willingness to invest an additional $100 million, of which $70 million (i.e. 70%) is expected to come from the Agricultural, Commercial and Industrial sectors? Of the $20 Million in additional NPV benefit identified by the TRC test, only about $8.0 million (40%) will be experienced by these sectors. This differs substantially from the other sectors, which will experience an incremental benefit of about $12 million for an incremental direct investment of about $30 million.

The challenges of the Societal Cost Test (SCT) are well documented. Given the difficulty in identifying the value of additional benefits identified in the SCT, MIPUG cautions against the use of this test for DSM planning.

PUB/MIPUG-7 Reference: Friesen Evidence, PDF page 29

Preamble:

The total NPV percentages of the Industrial gas portfolio on page 29 appear to be repeats of the percentages of the Industrial electric portfolio from page 26.

Request:

If the percentages are inadvertently repeated, provide the correct NPV percentages for the Industrial gas portfolio.

Response:

In reviewing this portion of Mr. Friesen's evidence, it is noted that Paragraph 1 on PDF Page 29 inadvertently repeated information specific to the electric portfolio (Paragraph 1 of page 26).

The paragraph should have read as follows;

> "Efficiency Manitoba's Three-Year Plan (Appendix A - Section A3, Figure A3.11, p.20 of 21) provides the PACT NPV Summary for each natural gas program in the industrial bundle. The information provided in MIPUG/EM I-11a indicates that NPV Benefits of $28.4 Million, NPV Costs of $5.1 Million and NPV Net Value of $23.3 Million are provided by the industrial sector bundle. The industrial bundle represents about 38%, 10% and 105% of the natural gas portfolio NPV Benefits, NPV Costs and NPV Net Value prior to the inclusion of overhead and interactive effects. The table below provides the underlying industrial sector data for Figure A3.11, while Total NPV Benefits, Total NPV Costs and Total NPV Net Value were drawn from PUB/EM I-11a
>
> – Natural Gas Program Cost-Effectiveness Metrics (PACT p.169 of 394):"

Additionally, Mr. Friesen submits the following evidence revisions:

1. Paragraph 6 on PDF Page 27 of Friesen Evidence should have read:

> " …relative natural gas program budget for each program in the industrial program bundle."

2. Table 3.5: Industrial Natural Gas Program Bundle Costs on PDF Page 28 should have reflected the following values:

Table 3.5: Industrial Natural Gas Program Bundle Costs (p. 27)

Industrial Program Bundle	Budget ($) 2020/21	Budget (%) 2020/21	Buget ($) 2021/22	Budget (%) 2021/22	Budget ($) 2022/23	Budget (%) 2022/23
Custom	$1,692,000	79.8%	$1,007,000	66.3%	$1,395,000	74.3%
HVAC & Controls	$12,000	0.6%	$12,000	0.8%	$13,000	0.7%
New Construction & High Performance Buildings	$247,000	11.7%	$307,000	20.2%	$257,000	13.7%
Renovation	$126,000	5.9%	$150,000	9.9%	$168,000	9.0%
Program Support	$42,000	2.0%	$43,000	2.8%	$44,000	2.3%
Total	$2,119,000	100.0%	$1,519,000	100.0%	$1,877,000	100.0%

3. Paragraph 1 on PDF Page 28 should have read:

> "…the Custom program that represents over 95% of the total natural gas savings withing the bundle having levelized costs of 2.53 cents per cubic meter as noted in MIPUG/EM I-11a (p. 53 of 72)."

Mr. Friesen will refile his evidence to address these revisions.

PUB/MIPUG-8 Reference: Friesen Evidence, PDF page 34

Request:

a) Refile table 3.9 showing Industrial and Load Displacement savings and budget separately.

b) Refile the version of table 3.9 filed in (a) removing the savings from codes and standards.

Response:

a)

Please see the requested table below, which separates Industrial Load Displacement savings and budgets.

Table 3.9 – Allocated Savings & Budget by Sector (isolating Load Displacement)

Customer Segment / Category	Annual Savings & Budget Allocations						Average	
	Savings (%) 2020/21	Budget (%) 2020/21	Savings (%) 2021/22	Budget (%) 2021/22	Savings (%) 2022/23	Budget (%) 2022/23	Savings (%) 2020-2023	Budget (%) 2020-2023
Industrial - Other Measures	13%	15%	10%	12%	11%	14%	11%	14%
Industrial - Load Displacement	26%	3%	30%	12%	28%	6%	28%	7%
Agricultural	3%	4%	3%	4%	3%	4%	3%	4%
Commercial	36%	40%	34%	35%	34%	34%	35%	36%
Residential	21%	18%	22%	18%	23%	20%	22%	19%
Income Qualified	0.7%	3%	0.7%	3%	0.7%	3%	1%	3%
Indigenous	0.4%	2%	0.5%	3%	0.5%	3%	0.5%	3%
Enabling Strategies	-	11%	-	10%	-	10%	0%	10%
Overhead	-	4%	-	4%	-	6%	0%	5%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Note: May not add up due to rounding								

b)

Please see the requested table below, with separated Industrial Load Displacement and isolates codes and standards savings.

Table 3.9 – Allocated Savings & Budget by Sector (isolating Codes & Standards)

Customer Segment / Category	Annual Savings & Budget Allocations						Average	
	Savings (%) 2020/21	Budget (%) 2020/21	Savings (%) 2021/22	Budget (%) 2021/22	Savings (%) 2022/23	Budget (%) 2022/23	Savings (%) 2020-2023	Budget (%) 2020-2023
Industrial - Other Measures	13%	15%	10%	12%	11%	14%	11%	14%
Industrial - Load Displacement	26%	3%	30%	12%	28%	6%	28%	7%
Agricultural	3%	4%	3%	4%	3%	4%	3%	4%
Commercial - without C & S	27%	40%	24%	35%	23%	34%	25%	36%
Residential - without C & S	6%	18%	6%	18%	7%	20%	6%	19%
Income Qualified	0.7%	3%	0.7%	3%	0.7%	3%	1%	3%
Indigenous	0.4%	2%	0.5%	3%	0.5%	3%	0.5%	3%
Enabling Strategies without C&	-	10%	-	9%	-	9%	0%	9%
Codes & Standards	24%	0.9%	26%	0.7%	27%	0.7%	26%	0.8%
Overhead	-	4%	-	4%	-	6%	0%	5%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Note: May not add up due to rounding								

PUB/MIPUG-9 Reference: Friesen Evidence, PDF page 36

Request:

Refile table 3.15 removing load displacement projects

Response:

Please see the reproduced table 3.15 below, removing the load displacement projects.

Table 3.15 – Industrial Sector Savings (without Load Displacement)

Target Fiscal Year	Anticipated Savings (per Plan)	Anticipated Budget (% of Total)	Anticipated Budget (per Plan)	Acquisition Cost ($/kWh)
2020/21	47	15%	$6,890,000	$0.146
2021/22	40	12%	$6,384,000	$0.159
2022/23	46	14%	$6,924,000	$0.151

PUB/MIPUG-10 Reference: Friesen Evidence, PDF page 39

Preamble:

"Industry must however be motivated to participate in Efficiency Manitoba's program offering if the Three-Year Plan is to achieve its objectives. Key factors influencing participation by the industrial sector include programming that is timely and accessible, with incentive levels that recognize metrics used by industry for evaluating project economics."

Request:

Please explain the methodology that could be used to determine incentive levels that recognize metrics used by industry for evaluating project economics.

Response:

Determining the appropriate incentive level provided by a program administrator for a specific measure is a complex undertaking. As discussed in Incentive Scenarios in Potential Studies: A Smarter Approach - if the objective is to reach out to as many potential participants as possible, it may be desirable to increase the incentive levels and thereby obtain the benefits of greater savings, with the caution that greater costs will be incurred. If there is a fixed savings target and the objective is to acquire those savings at the lowest possible cost, it may be desirable to provide a higher incentive level for lower cost measures, and thereby obtain a greater share of the savings target at the lowest cost.[2]

Industrial customers consider a variety factors when making decisions about energy efficiency, including considerations such as perceived risk, economic capacity, competition for capital, etc. It becomes readily apparent that there may often be more than one right answer to the question of incentive levels, but there should always be a basic understanding of how incentive levels impact decisions made by industry regarding participation in energy efficiency programming. In some instances, the incentive will be too low to capture a reasonable share of the available opportunity, while in others it may be greater than what is required to capture the desired savings (i.e. increasing the percentage of free riders).

The key to any methodology used for establishing incentive levels is a clear understanding of the relationship between the rationale behind customer decision-making process and incentive levels. An energy efficiency project with a 2-year payback may not be implemented if its adoption is disruptive to key production processes and requires lengthy downtime for installation. It may also be set aside in favor of a more expensive project with a lower rate of return that provides greater net benefits in terms of reduced costs or increased revenues. In these circumstances, high incentives levels may be needed to make projects more appealing to the industrial consumer.

[2] Incentive Scenarios in Potential Studies: A Smarter Approach, Cory Welch, Navigant Consulting, Inc., Denise Richerson-Smith, UNS Energy Corporation, 2012 ACEEE Summer Study on Energy Efficiency in Buildings. Available online: https://aceee.org/files/proceedings/2012/data/papers/0193-000050.pdf

Another consideration relates to the tipping point at which the benefits obtained from the additional savings achieved through higher incentive levels create program costs that are unnecessary for achieving the desire objective or result in rate impact that is deemed to be inappropriate by stakeholders.

Industrial Sector Decision-Making

Industrial sector decisions are usually driven by production-related priorities (i.e. related to market demand & price, quality and input costs) and mandated regulatory requirements (i.e. health, safety, environmental, codes and standards, etc.). Spending decisions related to regulatory requirements are generally non-discretionary in nature, while spending related to production improvements is usually based on the overall competitive position of the organization within the market sectors that it services, opportunities for improved quality and productivity, as well as possible reductions for input costs, including energy. Capital spending decisions are usually vetted using company-specific criteria that revolve around access to capital and desired rates of return that can be generated for shareholders. In most industries, projects are measured against each other in a competition for available capital resources, with non-discretionary projects given more latitude than discretionary projects when acceptable rates of return are examined.

The priority placed on energy efficiency spending is often illustrated quite clearly by the minimum rate of return specified for evaluating these projects. Achieving this rate of return is not a guarantee that an energy efficiency project will move forward. Capital rationing may dictate that higher priority projects with larger cost savings or revenue impacts move forward while an energy efficiency project that meets the minimum criteria and potentially offers a superior rate of return is not pursued.

Efficiency Manitoba needs to be diligent in its consultation with industry to determine the incentive level needed to move discretionary energy efficiency projects forward.

The emphasis placed on energy efficiency projects varies dramatically between industry sectors and individual companies based on the share of total operating costs that can be attributed to energy costs. Climate change policies, carbon taxes and other factors can play a role in setting these decision priorities, but energy cost share is often a primary indicator of priority. Among MIPUG members, this percentage varies from about 5% - 15% for manufacturing companies, increasing to 15% - 60% plus for more energy-intensive processing companies.

- Companies with a lower share of energy costs generally have higher thresholds for justifying capital expenditures on energy efficiency improvements, indicating a possible requirement for higher incentives levels.
- Energy-intensive industries with large investments in continuous processes will generally place a greater emphasis on energy costs and energy efficiency, but also recognize that implementing energy efficiency improvements into their core energy-consuming processes can be complicated, expensive and highly disruptive to production output.

For this later reason, energy intensive industries tend to be more focused on energy costs in their decision-making. They also have indicated in the past that maximum incentive caps limit available support to levels that do not match well to the required expenditures for these capital-intensive projects and high costs for disruption to production schedules.

While key considerations driving energy efficiency decisions may focus on energy costs and potential savings that may arise from a reduction in total energy consumption (i.e. total cost measurement), industry is often focused on energy consumption/cost per unit of output (i.e. productivity measurement). Successful implementation of energy efficiency projects that materially reduces per unit energy consumption/costs may result in increases to overall energy consumption.

The Efficiency Manitoba Plan needs to have a methodology for capturing and recognizing energy savings that increase energy consumption and related GDP growth in the Province.

Decision-Making is Influenced by Timing

Incentive rates can often be optimized when energy efficiency improvements are incorporated into projects made for priority production or regulatory reasons, since costs for removal of existing equipment and installation of new equipment are already considered to be part of the original projects. Incremental costs for energy efficiency improvements then become more closely aligned with the difference in cost between lesser efficient and more efficient options. This scenario creates the opportunity for savings acquisition at a lower overall cost than would otherwise be available when equipment replacement was undertaken purely for energy efficiency gains. These opportunities exist most commonly when a critical process is being refurbished or facilities are being constructed or expanded.

Under these scenarios, where energy efficiency projects are attached to larger project spending, it may be advantageous for the Efficiency Manitoba to cover a higher percentage of the incremental cost to ensure that these improvements are realized. These savings generally have a long life and therefore provide greater value, which supports the potential for greater incentive support.

Engagement must encompass an awareness of customer priorities, understanding of key production processes, aversion to risk, awareness of planning timelines and constraints, and credible knowledge about the suitability of programs promoted through incentives to the customer's processes. A flexible format for establishing incentive levels that enables program administrators to quickly adapt to the customer's timelines and priorities is required. It also requires an assurance that the application process will not unnecessarily encumber the timelines for completing the project. The complexity of the application process has proven to be a major deterrent for industrial sector participation. This flexibility includes the ability to response in a timely fashion to requests for large funding commitments.

There can also be different perceptions between program coordinators, designs and company project managers about the full cost profile for implementing efficiency measures. A common complaint heard by program coordinators is that the available incentives are not large enough to make up for potential delays for completing the project and the additional analysis required to validate savings.

Fundamentally, programming designed to accommodate the timing of major industrial improvements, planned shutdowns and equipment replacement or new construction will yield the largest benefits at the lowest cost, even if higher incentive levels are applied to those low-cost initiatives. For the reasons outlined in this response, it is not always advantageous to use % of cost caps for determining incentive contribution levels, as restrictive incentives for lower-cost opportunities may reduce opportunities for acquiring high value, low cost savings.

PUB/MIPUG-11 Reference: Bowman Evidence pdf p.10

Preamble:

"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."

Request:

a) Provide details of the calculations used to arrive at the short-term marginal value of 6.55 cents/kWh.

b) Is Mr. Bowman aware of an explanation for this apparent anomaly?

Response:

(a)

The cited values relate to the PACT metrics over a five-year horizon (e.g., if all cost and benefits from only the first 5 years are included).

6.55 cents/kWh is the product of 5.5 cents/kWh (The cited PACT levelized cost) and 1.19 (the cited PACT ratio, which is benefits divided by cost).

(b)

No Mr. Bowman cannot explain the anomaly. Mr. Bowman does not have access to Manitoba Hydro's marginal values or to EM's calculations. There are three possibilities that would be important to explore, had proper data been made available for analysis:

1) Hydro's current marginal values are well above the values last made available in a public way. This would be easy to check if Hydro were to provide values to update PUB/MH II-57 (Revised) dated 2017-12-18 from the 2017/18 & 2018/19 GRA, which all parties had access to and was not considered confidential. It is not apparent why this could not be updated publicly.

2) It is possible that Hydro's marginal values show a severe distinction between certain periods, like summer and winter or on-peak and off-peak, and EM has precisely designed programs that save entirely within the highest cost periods. This seems unlikely, as many programs in question, such as Home Renovation or Energy Efficiency Kits or Product Rebates, are not targeted to certain time periods in a year. It should be assumed that a home renovation improvement, for example upgraded insulation, may provide benefits in any range of hours not just targeted as the highest cost peak hours.

3) There may be a special added capacity benefit added to the programs, which could mean larger than average savings if programs were targeted at the highest peak hours. However, any such capacity benefit should already be included in Hydro's marginal costs from the 2017/18 and 2018/19 GRA, so this appears unlikely as well.

Outside of this, the other possibilities are even less likely, for example a massive increase in distribution or transmission marginal costs, which would have been made clear with a proper answer to IR MIPUG/EM I-3f which requests updated transmission and distribution studies that have been routinely made available in prior PUB proceedings and had no claims of confidentiality.

In short, the values underline the importance of good information sharing as is typical for resource planning exercises throughout Canada.

PUB/MIPUG-12 Reference: Bowman Evidence pdf p.4-6, 11, 20, 30

Preamble:

"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."

"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."

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.

Request:

a) Does this recommendation take into account the EM Plan objectives other than minimizing the cost of acquiring the target level of DSM?

b) Please explain the approach to accommodating other objectives that could be used to determine an acceptable increase in portfolio levelized cost per kWh in order to accommodate other objectives.

c) If the present value of the benefits of Efficiency Manitoba's Plan exceed the costs of Efficiency Manitoba's Plan over the long term, and it otherwise meets the legislated requirements, explain why it is not recommended to proceed with the Plan.

d) Is Mr. Bowman advocating that Efficiency Manitoba select DSM measures for its Plan based solely on a ranking of measures by cost (or cost effectiveness)? If so, explain how this is aligned with the legislated objective in the Act s.11(4)(c) of providing initiatives that are accessible to all Manitobans.

Response:

(a)

The recommendation does take into account Efficiency Manitoba's objectives. First, note that EM does not have specific objectives for the Plan set out in clear terms in the EM filing.

The EM mandate per the Efficiency Manitoba Act is as follows:

> **Mandate**
>
> 4(1) The mandate of Efficiency Manitoba is to
>
> (a) implement and support demand-side management initiatives to meet the savings targets and achieve any resulting reductions in greenhouse gas emissions in Manitoba;

(b) achieve additional reductions in the consumption of electrical energy or natural gas — including resulting reductions in the demand for electrical power — if the reductions can be achieved in a cost-effective manner;

(c) 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;

(d) if any of the following are prescribed as being subject to demand-side management under this Act, carry out the prescribed duties in respect of them:

(i) demand for electrical power in Manitoba,

(ii) potable water consumed in Manitoba,

(iii) fossil fuels consumed in the transportation sector in Manitoba; and

(e) promote and encourage the involvement of the private sector and other non-governmental entities in the delivery of its demand-side management initiatives.

Considering the above,

- subsections (b) and (d) are not relevant to the current time.
- Subsection (e) is not affected by the referenced recommendations.
- Subsections (a) and (c) are specifically addressed by the recommendations, in that the largest possible energy savings will be achieved at the lowest possible cost by prioritizing cost-effectiveness. Whether this means lower costs for ratepayers, or means more conservation can be achieved (which will defer capital investments the farthest, and achieve the largest demand-side management) the performance of EM on its mandate is enhanced by focusing on cost-effectiveness.

Note that this broadly also addressed the required PUB considerations in section 11 of the EM Regulations, which requires the interests of residential, commercial and industrial customers to be taken into account. Customer interest in terms of acquiring resources for Hydro (whether power resources or any other item of supplies and services) are best taken into account through lowest cost procurement.

This objective is also linked to the PUB decision as to the recovery of EM's expenses, which is spread across all classes as a resource acquisition expense, not a customer class-specific program with costs allocated to the class.

(b)

Other objectives that are aimed at bill savings for designated customer classes, in the interest of some equity or access objective which is not consistent with least-cost programming, could be achieved by targeting (i.e., directly assigning) the cost recovery for such programs to the class that participates, rather than broadly to the generation function (or even the transmission and distribution functions generally).

Please see the response to EM/MIPUG I-3.

(c)

The plan should represent the best means to achieve Integrated Resources Planning, consistent with the PUB's finding in the NFAT. This has not been demonstrated.

If the best IRP analysis supports 1.5% annual savings, based on an appropriate analysis of alternatives, then pursuit of 1.5% savings at the lowest reasonable cost should be the focus of EM's activities. Among the first steps, however, is the determination that the power is actually required (the basic principle behind the "Need For and Alternatives To" approach to IRP analysis).

Absent lowest cost programming to achieve the targeted savings, EM is electing to incur costs that are not necessary, prudent or required to provide service. Under all normal principles for regulatory ratemaking, such costs should not be recovered as part of rates through cost of service allocation.

Further, just as the NFAT analysis considered not just the lifetime potential for NPV savings of a new plant, it also considered the impact on rates over short-term term horizons, so should the DSM programming.

Note that the DSM advocacy based on IRP is founded on the idea that DSM is a supply resource. If Hydro comes forward with a new wind project founded in the idea that it will have a positive NPV over 30 years, even if it will only drive up rates on average by small amounts, but with strong evidence that it will drive up rates materially for most of the intervening period, and with potentially significant uncertainty about the marginal benefits (due to longer-term projections) plus no evidence that the power is actually required, it would be unlikely such resource would get approval from a regulator with jurisdiction over capital spending. As a resource equivalent to other power sources, DSM must be considered on the same footing.

(d)

The aim of accessibility to savings can be achieved with codes and standards (which affect all customers), and low-cost education initiatives. The only barrier to accessibility once these actions are taken is to those with limited financial means, and this is addressed by the targeted programming for low income and indigenous customers. If the programs for particular classes are focused only on these initiatives, due to any other programs being excessively high cost compared to alternatives, then the legislative provision of "reasonably achieving" accessibility would likely have been met.

PUB/MIPUG-13 Reference: Bowman Evidence pdf p.4, 5, 15

Preamble:

"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)."

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

"RECOMMENDATION [5]: Future three-year EM reviews should require appropriate IRP information, including testing of resource plans, supply options and marginal values."

Request:

a) Please confirm that Mr. Bowman's recommendation 2 implies that EM's Plan should be based on a current integrated resource plan (IRP). If not, please explain.

b) Please provide a description of the process that could be adopted for developing an IRP that could be used as a basis for developing Efficiency Manitoba's Plan.

c) Is Mr. Bowman recommending that the 2020-2023 Efficiency Plan should not be accepted until an IRP has been completed as a basis for the Plan, or, as implied by recommendation [5], is it recommended that EM's 2023-2026 Efficiency Plan should be based on an IRP?

d) Identify the specific items that Efficiency Manitoba should include in future filings that would satisfy Mr. Bowman's recommendation 3.

Response:

(a)

The recommendation is that the PUB establish the framework for future Efficiency Manitoba reviews (i.e., in three years) which will include an IRP-based assessment of alternative supply options and alternative savings targets, to inform recommendation to Government on any needed adjustments to the EM legislation and targets.

This framework should include all normal IRP elements.

(b)

The process for developing an IRP begins with defining the need for a resource, based on load forecasts and economic trends, and moves to assessing the resource options available to meet that need, including DSM.

Consider the following excerpts from the Board's report on the NFAT:

> Page 81: Elenchus and Mr. Dunsky emphasized that Manitoba Hydro should treat DSM as a resource option from the outset, assessing it in the same manner as investments in traditional resource options such as hydro dams or investments in transmission and distribution. Both suggested that Manitoba Hydro pursue an Integrated Resource Planning (IRP) approach to evaluate supply- and demand-side resources on an equal footing.
>
> Page 33: By failing to offer an analysis of conservation measures as a stand-alone energy resource competitive with other generation resources, Manitoba Hydro presented an analysis of conservation measures that was neither complete, accurate, thorough, reasonable nor sound.
>
> > [NOTE that the current EM plan presents an analysis of conservation measures as a stand-alone resource without reference to other generation resources – the very failing that the Hydro NFAT was criticized for.]
>
> Page 34: 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.
>
> > [NOTE that the current EM plan does not place every supply and demand side resource on an equal footing.]

Page 81 sets out the then existing Manitoba Hydro process, which was the basis of the Board's criticism:

> Manitoba Hydro provided evidence on how its DSM initiatives fit into its power resource planning process. Referring to the interface as a "combined DSM integrated resource planning process", it begins with resource planning staff indicating a value that represents the value of energy to Manitoba Hydro (currently approximately 7.5 ¢/kWh). This marginal value represents the value of energy that is saved and then exported combined with the avoided cost of new transmission and distribution infrastructure. This value is used to update Manitoba Hydro's Power Smart Plan in relation to economic DSM opportunities based on a total resource cost metric. The revised plan is then provided back to Manitoba Hydro's resource planners for input into the resource planning process.

Note that the above description is effectively identical to the process followed by Efficiency Manitoba.

The issue for Manitoba is that the PUB likely has limited jurisdiction to include IRP as part of Manitoba Hydro's rate reviews. As part of EM reviews, however, there appears to be no such limitation on the matters the PUB can scope in related to IRP. In fact, without suggesting a legal opinion on the matter, section 11 of the EM regulations, particularly subsections (d), (e), and (g) appear to not only permit, but effectively require, the PUB to scope in matters of IRP.

The process should include developing minimum filing requirements for EM's next proceeding, including any needed documentation or sworn testimony from Manitoba Hydro. This would include load forecasts with scenario analysis, Manitoba Hydro's latest resource plans and marginal values under varying circumstances, for full and proper testing as they relate to EM's plans (which does not appear to be in any way limited by section 12(1)(b) which only requires that Manitoba Hydro set the methodology, not the input assumptions or complement of resource options to be assessed).

(c)

The recommendation is that the 2023-2026 Efficiency Plans should be based on IRP principles and methods. The 2020-2023 plan will not have such analysis, given the scope and timing that has been imposed on the Board. However, the budgets for 2020-2023 should be subject to adjustment if later Manitoba Hydro reviews highlight adverse changes in assumptions or need.

(d)

The information to fulfill recommendation 3 should include long-term financial and rate forecasts under varying resource assumptions (supply options and levels of DSM), varying economic input variables, and load scenarios and up-to-date information on supply options.

PUB/MIPUG-14 Reference: Bowman Evidence pdf p.5, 17

Preamble:

"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."

Request:

a) Explain how the savings achieved by parties external to Efficiency Manitoba, accomplished with their own funds, contributes to making Efficiency Manitoba accountable for achieving its legislated obligations.

b) If this recommendation was accepted, would it be necessary to also adjust Efficiency Manitoba's savings targets to reflect higher overall savings consistent with "net" electricity and gas targets that are in the current legislation?

Response:

(a)

Efficiency Manitoba operates within a framework of broad conservation objectives. This could include monitoring, coordination and education, and where necessary the operation of programming for technical support or incentives. It is not apparent that there is benefit from making EM in conflict or redundant with the achievements of related entities.

In particular, given the failure to establish the basic principle of need in terms of resource planning, the potential for doubling up or more on demand-side resources or elasticity effects may be a concern.

(b)

No. It would simply be necessary to recognize that there are beneficial developments and players in the market other than EM (rather than ignoring these players) and adjusting the expectations on EM accordingly.

This is not unlike many government-related functions, where the first role is to monitor, collect data, ensure progress is being made towards targets, pursue targeted initiatives (such as low income, or one-on-one initiatives with load displacement, for example) and then, where necessary to address targets not being achieved by codes or education or other actors, EM can act through broad programs.

PUB/MIPUG-15 Reference: Bowman Evidence pdf p.5, 17, 18; Board Order 161/19

Preamble:

“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.’”

Request:

a) How should the elasticity effects of general rate decreases, or specific class rate decreases, be addressed? Should additional savings be required from Efficiency Manitoba when there are rate decreases?

b) Please address the practicality of incorporating elasticity from annual rate changes into a three-year efficiency plan, or from quarterly rate changes, as are implemented for gas rates, into efficiency plans covering periods of one to three years.

c) Explain how consistent and accepted elasticity factors should be determined in order that savings from rate changes are able to be evaluated and verified.

Response:

(a)

Mr. Bowman is not aware of the prospect of rate decreases. But in principle, yes there may be the basis for action to increase efficiency activities when there are rate decreases.

The elasticity effects of rate changes should be considered by EM, at minimum to include rate design changes or abnormally high rate adjustments, but potentially also including overall rate changes. This is because increased cost is a driver of efficiency as much if not more than any EM program. The effects of rate changes are more direct, more broadly felt, and of a greater urgency than any EM program. The impact of rate increases also adversely affect the affordability of electricity and industrial competitiveness – doubling up on these effects through EM-driven rate increases would be unfortunate.

(b)

The practical impact of including elasticity effects would likely be to drive savings in a year higher than anticipated by EM, which can lead to lower savings targets needed in future years, per the Efficiency Manitoba Act section 7(2).

(c)

The development of elasticity factors is a normal and necessary part of operating a large utility. Manitoba Hydro makes use of such factors in its load forecast routinely. It would not appear there would be a basis to need more “consistent and accepted” elasticity factors for the purposes of the noted recommendation.

PUB/MIPUG-16 Reference: Bowman Evidence pdf p.5, 18

Preamble:

“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.’”

Request:

a) Would it be consistent with this recommendation if EM was mandated to pursue the adoption of higher efficiency standards in the industrial sector in a manner analogous to pursuing higher efficiency codes and standards for the residential and commercial markets?

b) Explain how the savings from such activities would be measured and verified. How would the independent assessor know which less efficient technologies and baseline consumption were contemplated or modeled by the commercial or industrial customer? How would a situation where there was a range of technologies of varying efficiency be treated, if the customer considered all of them at the early stages of design but early on decided that the lowest efficiency technologies would not be considered further (and absent any input from Efficiency Manitoba)?

Response:

(a)

Yes it would be consistent, but this is not sufficient. The intent is that a new industrial plant locating in Manitoba may elect to use a given approach to construction, process technology, etc., but the efforts of Efficiency Manitoba (or other actors) can lead to adoption of more energy efficient alternatives. This is a real and valuable saving that should be included in conservation targets. It may be that EM is already intending such savings to be included in its target – the recommendation is mainly to ensure the principle is clear in the regulation.

(b)

The confirmation of new process efficiencies is a normal part of measurement and verification of DSM savings. There is nothing required to complete such analysis in Manitoba that is not already part of the standard practice of DSM evaluation.

As noted in PUB/MIPUG I-14 as to whether it is indeed of any significance or import that EM participated in the design, or was able to claim public relations credit for the decision.

PUB/MIPUG-17 Reference: Bowman Evidence pdf p.24

Request:

a) Confirm whether Mr. Bowman's analysis of short-term rate impacts, including an impact of 0.17 cents/kWh, is a theoretical rate increase compared to the level of Manitoba Hydro's rates necessary to maintain its level of net income if Manitoba Hydro were to provide no funding for Efficiency Manitoba's DSM activities.

b) Confirm whether Mr. Bowman's short-term rate impact analysis includes the reduction in DSM amortization resulting from Manitoba Hydro's prior deferrals becoming fully amortized. If not, recalculate the short-term rate impact including any reduced DSM amortization.

Response:

(a)

Confirmed. This is the adverse rate impact of EM activities, or of other savings on which EM claims to have had a material impact.

(b)

The rate impact calculation does not include the effect of any terminating DSM amortization from past periods, because to the best of Mr. Bowman's information no such termination will occur. Below is the amortization of DSM estimate from PUB/MH I-9 (Updated) from the Manitoba Hydro 2019/20 Electric Rate Application, which indicates the costs of amortizing DSM only increases over the period to 2023, and presumably the deferred balance as well given the ongoing and continuous growth in finance expense.

DSM
(In Millions of Dollars)

For the year ended March 31	**2019**	**2020**	**2021**	**2022**	**2023**
Finance Expense	3	4	7	11	14
OM&A Costs	1	1	1	1	1
Amortization	-	6	12	21	30
Capital Tax	1	2	2	2	3
	5	13	23	36	47