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PART 3

SAVINGS TARGETS AND EFFICIENCY PLANS

SAVINGS TARGETS

Initial savings targets

7(1) Subject to the regulations, the annual savings targets that Efficiency Manitoba is responsible for meeting in the 15-year period following the commencement date are as follows:

Electrical Energy

In the initial year following the commencement date, net savings that are at least equal to 1.5% of the consumption of electrical energy in the preceding year.

In each of the following years, incremental net savings that are at least equal to 1.5% of the consumption of electrical energy in the immediately preceding year.

Natural Gas

In the initial year following the commencement date, net savings that are at least equal to 0.75% of the consumption of natural gas in the preceding year.

In each of the following years, incremental net savings that are at least equal to 0.75% of the consumption of natural gas in the immediately preceding year.

PARTIE 3

OBJECTIFS D'ÉCONOMIES ET PLANS D'EFFICACITÉ ÉNERGÉTIQUE

OBJECTIFS D'ÉCONOMIES

Objectifs d'économies initiales

7(1) Sous réserve des règlements, les objectifs d'économies annuelles que la Société est chargée d'atteindre pour la période de 15 ans à compter de la date de mise en œuvre sont les suivants :

Énergie électrique

Dans l'année initiale suivant la date de mise en œuvre, des économies nettes équivalant à au moins 1,5 % de la consommation d'énergie électrique au cours de l'année précédente.

Pour chacune des années subséquentes, des économies nettes supplémentaires équivalant à au moins 1,5 % de la consommation d'énergie électrique au cours de l'année précédente.

Gaz naturel

Dans l'année initiale suivant la date de mise en œuvre, des économies nettes équivalant à au moins 0,75 % de la consommation de gaz naturel au cours de l'année précédente.

Pour chacune des années subséquentes, des économies nettes supplémentaires équivalant à au moins 0,75 % de la consommation de gaz naturel au cours de l'année précédente.

Targets are cumulative

7(2) Shortfalls or surpluses in annual net savings carry forward during the 15-year period under subsection (1) such that at the end of the period Efficiency Manitoba must demonstrate that the cumulative total of the annual percentage savings in the consumption of

- (a) electrical energy is 22.5%; and
- (b) natural gas is 11.25%.

Calculating net savings

7(3) Net savings for the consumption of electrical energy or natural gas are to be determined in accordance with the regulations.

Savings targets after first 15 years

8 For each 15-year period after the initial 15-year period referred to in subsection 7(1), the Lieutenant Governor in Council must, by regulation, establish annual and cumulative savings targets in respect of the consumption of electrical energy and natural gas.

Caractère cumulatif des objectifs d'économies

7(2) Les déficits ou les surplus au chapitre des économies nettes annuelles sont reportés sur la période de 15 ans visée au paragraphe (1) de sorte que la Société démontre à la fin de cette période qu'elle a enregistré cumulativement les taux d'économie annuelle suivants :

- a) 22,5 % pour l'énergie électrique;
- b) 11,25 % pour le gaz naturel.

Calcul des économies nettes

7(3) Les économies nettes pour la consommation d'énergie électrique ou de gaz naturel sont fixées en conformité avec les règlements.

Objectifs d'économies après les 15 premières années

8 Pour chaque période de 15 ans suivant la période initiale visée au paragraphe 7(1), le lieutenant-gouverneur en conseil fixe, par règlement, les objectifs d'économies annuelles et cumulatives en matière de consommation d'énergie électrique et de gaz naturel.

EFFICIENCY PLANS

Efficiency plans

9 For the three-year period following the commencement date, and for each three-year period after that, Efficiency Manitoba must prepare an efficiency plan that includes the following information:

- (a) a description of the demand-side management initiatives it proposes to meet the savings targets that apply to the period;
- (b) a description of the educational initiatives it proposes to undertake and the support it proposes to provide for encouraging innovations in areas related to its mandate;

PLANS D'EFFICACITÉ ÉNERGÉTIQUE

Plans d'efficacité énergétique

9 Pour la période de trois ans suivant la date de mise en œuvre et pour chaque période de trois ans suivante, la Société établit un plan d'efficacité énergétique qui contient les renseignements suivants :

- a) une mention des initiatives d'effacement de consommation qu'elle propose de mettre en œuvre pour atteindre les objectifs d'économies applicables à cette période;
- b) une mention des initiatives de sensibilisation du public qu'elle propose de mettre en œuvre et du soutien qu'elle propose d'accorder pour stimuler les innovations dans des secteurs liés à son mandat;

Definitions

2 The following definitions apply in this Act.

"board" means the board of directors of Efficiency Manitoba. (« conseil »)

"commencement date" means the date Efficiency Manitoba is to begin implementing its first efficiency plan, as prescribed in the regulations. (« date de mise en œuvre »)

"consumption" means, on a weather-adjusted basis,

(a) for electrical energy, electrical energy that is metered and sold to a customer in Manitoba; and

(b) for natural gas, natural gas that

(i) is metered and sold to a customer in Manitoba, and

(ii) is not used as a feedstock or ingredient in the manufacture of a product. (« consommation »)

"demand for electrical power" means the requirement for electrical power at a specific time by a user of electrical power in Manitoba. (« demande en puissance électrique »)

"demand-side management initiative" means a measure or action taken, or a program, service or rate designed to reduce the consumption of electrical energy or natural gas, including a resulting reduction in the demand for electrical power, in Manitoba, but does not include

(a) a measure, action, program, service or rate that encourages or results in a switch from the use of one kind of fuel source to another if the switch increases greenhouse gas emissions in Manitoba; or

(b) a prescribed measure, action, program, service or rate. (« initiative d'effacement de consommation »)

Définitions

2 Les définitions qui suivent s'appliquent à la présente loi.

« **conseil** » Le conseil d'administration de la Société. ("board")

« **consommation** » Compte tenu du rajustement pour les aléas climatiques, s'entend de la consommation :

a) d'énergie électrique, laquelle est mesurée et vendue à un client au Manitoba;

b) de gaz naturel, lequel :

(i) d'une part, est mesuré et vendu à un client au Manitoba,

(ii) d'autre part, n'est pas utilisé comme matière première ni comme ingrédient dans la fabrication d'un produit. ("consumption")

« **date de mise en œuvre** » Date fixée par règlement à laquelle la Société doit mettre en œuvre son premier plan d'efficacité énergétique. ("commencement date")

« **demande en puissance électrique** » La puissance électrique dont a besoin à un moment précis un utilisateur au Manitoba. ("demand for electrical power")

« **économies nettes** » À l'égard d'une variation de la consommation d'énergie électrique ou de gaz naturel au Manitoba, s'entend des économies réalisées après qu'il a été tenu compte des autres ajustements dans la consommation attribuables à cette variation ou influencés par celle-ci. ("net savings")

« **exercice** » Période débutant le 1^{er} avril d'une année et se terminant le 31 mars de l'année suivante. ("fiscal year")

« **Hydro-Manitoba** » S'entend également de la filiale Centra Gas Manitoba Inc. et de toute société qui lui succède. ("Manitoba Hydro")

"**Efficiency Manitoba**" means Efficiency Manitoba Inc. established by section 3. (« Société »)

"**efficiency plan**" means a plan required under section 9. (« plan d'efficacité énergétique »)

"**fiscal year**" means the period beginning on April 1 of one year and ending on March 31 of the following year. (« exercice »)

"**government agency**" means a government agency as defined in *The Financial Administration Act*. (« organisme gouvernemental »)

"**Manitoba Hydro**" includes Manitoba Hydro's subsidiary Centra Gas Manitoba Inc. and any successor company to Centra Gas Manitoba Inc. (« Hydro-Manitoba »)

"**minister**" means the minister appointed by the Lieutenant Governor in Council to administer this Act. (« ministre »)

"**net savings**" means, in respect of a change in the consumption of electrical energy or natural gas in Manitoba, the savings that occur after taking into account any other adjustments in consumption that are attributable to, or influenced by, the change. (« économies nettes »)

"**personal information**" means personal information as defined in *The Freedom of Information and Protection of Privacy Act*. (« renseignements personnels »)

"**PUB**" means The Public Utilities Board continued under *The Public Utilities Board Act*. (« Régie »)

"**regulation**" means a regulation made under this Act. (« règlement »)

"**savings target**" means a savings target

(a) established under section 7; or

(b) prescribed by the regulations. (« objectif d'économies »)

« **initiative d'effacement de consommation** »
Mesure ou action prise, ou programme, service ou tarif conçu pour réduire la consommation d'énergie électrique ou de gaz naturel, y compris toute réduction de la demande en puissance électrique qui en résulte, mais à l'exclusion de ce qui suit :

a) une mesure, une action, un programme, un service ou un tarif qui facilite ou entraîne le remplacement de l'utilisation d'un type de carburant par un autre, si ce remplacement augmente les émissions de gaz à effet de serre au Manitoba;

b) une mesure, une action, un programme, un service ou un tarif désigné par règlement. ("demand-side management initiative")

« **ministre** » Le ministre chargé par le lieutenant-gouverneur en conseil de l'application de la présente loi. ("minister")

« **objectif d'économies** » Objectif d'économies qui est :

a) soit fixé en vertu de l'article 7;

b) soit prévu par règlement. ("savings target")

« **organisme gouvernemental** » S'entend au sens de la *Loi sur la gestion des finances publiques*. ("government agency")

« **plan d'efficacité énergétique** » Plan exigé en vertu de l'article 9. ("efficiency plan")

« **rajustement pour les aléas climatiques** » Rajustement visant à supprimer les effets des déviations par rapport aux conditions météorologiques moyennes. ("weather-adjusted")

« **Régie** » La Régie des services publics prorogée par la *Loi sur la Régie des services publics*. ("PUB")

« **règlement** » Règlement pris en vertu de la présente loi. ("regulation")

"weather-adjusted" means adjusted to remove the effect of deviations from average weather patterns.
(« rajustement pour les aléas climatiques »)

« **renseignements personnels** » S'entend au sens de la *Loi sur l'accès à l'information et la protection de la vie privée*. ("personal information")

« **Société** » La Société pour l'efficacité énergétique au Manitoba constituée en vertu de l'article 3. ("Efficiency Manitoba")

(b) assist various levels of government in consulting with Manitoba stakeholders for the purpose of developing or updating building or energy codes, standards and regulations in respect of matters relating to energy efficiency;

(c) develop and implement programs to improve building designs, building techniques and building technologies to increase energy efficiency;

(d) undertake education and training initiatives with respect to building and energy code requirements relating to energy efficiency; and

(e) assist the government, a municipality or local government district, or a community as defined in *The Northern Affairs Act*, in the review of building and construction plans with respect to codes, standards and regulations relating to energy efficiency.

b) aider les différents ordres de gouvernement dans le cadre des consultations avec les intéressés au Manitoba en vue de l'élaboration et de la mise à jour de codes, normes ou règlements relatifs au bâtiment ou à l'énergie en ce qui a trait aux questions portant sur l'efficacité énergétique;

c) élaborer et mettre en œuvre des programmes visant l'amélioration de la conception des bâtiments, des techniques et des technologies de construction afin d'accroître l'efficacité énergétique;

d) lancer des initiatives de formation relativement aux exigences en matière d'efficacité énergétique contenues dans les codes du bâtiment et de l'énergie;

e) aider le gouvernement, les municipalités et les districts d'administration locale, ainsi que les collectivités au sens de la *Loi sur les affaires du Nord*, dans l'examen des dessins de bâtiment et d'exécution relativement aux codes, aux normes et aux règlements en matière d'efficacité énergétique.

DETERMINATION OF SAVINGS

When savings may be counted

8(1) Net savings in the consumption of electrical energy or natural gas count towards the respective savings target established in section 7 of the Act if the net savings are reasonably attributable

(a) to a demand-side management initiative undertaken by Efficiency Manitoba or on its behalf;

(b) to incremental savings resulting from a demand-side management initiative undertaken by Manitoba Hydro if

(i) the initiative is included in an approved efficiency plan; and

(ii) Efficiency Manitoba provides operational support or an operating incentive in respect of the initiative that is necessary to achieve the incremental savings;

CALCUL DES ÉCONOMIES

Calcul des économies

8(1) Les économies nettes en matière de consommation d'énergie électrique ou de gaz naturel sont prises en considération dans le calcul des objectifs d'économies respectifs fixés à l'article 7 de la *Loi* si elles sont raisonnablement attribuables à un des éléments suivants :

a) une initiative d'effacement de consommation lancée par la Société ou en son nom;

b) des économies supplémentaires résultant d'une initiative d'effacement de consommation lancée par Hydro-Manitoba, si :

(i) l'initiative est comprise dans un plan d'efficacité énergétique approuvé,

(ii) la Société offre un soutien opérationnel ou un incitatif opérationnel à l'égard de l'initiative, lequel est nécessaire pour l'obtention des économies supplémentaires;

(c) to a code, standard or regulation to which Efficiency Manitoba or Manitoba Hydro has made a material contribution; or

(d) to a rate to which Efficiency Manitoba has made a material contribution.

8(2) Savings in the consumption of electrical energy that result from an initiative undertaken by Efficiency Manitoba under section 5 count towards the electrical energy savings targets.

8(3) Savings in the consumption of a fossil fuel other than natural gas that result from an initiative undertaken by Efficiency Manitoba under section 6 count towards the natural gas savings targets based on an equivalent heating value, but only if the savings

(a) relate to space, water or process heating; and

(b) do not result from switching from one type of fossil fuel to another type of fossil fuel.

Savings targets based on fiscal year

9 The savings targets during each one-year period of an efficiency plan are to be calculated by reference to the consumption of electrical energy or natural gas during the previous fiscal year and not the previous calendar year.

Net savings to be weather-adjusted

10 All net savings must be calculated on a weather-adjusted basis.

c) un code, une norme ou un règlement auxquels la Société ou Hydro-Manitoba a contribué de façon importante;

d) un tarif auquel la Société a contribué de façon importante.

8(2) Les économies en matière de consommation d'énergie électrique résultant d'une initiative que la Société a lancée en vertu de l'article 5 sont prises en considération dans le calcul des objectifs d'économies dans la consommation d'énergie électrique.

8(3) Les économies en matière de consommation de combustibles fossiles autres que le gaz naturel résultant d'une initiative que la Société a lancée en vertu de l'article 6 sont prises en considération dans le calcul des objectifs d'économies dans la consommation de gaz naturel, en fonction d'un pouvoir calorifique équivalent, mais uniquement si les conditions suivantes sont réunies :

a) les économies sont relatives au chauffage local, au chauffage de l'eau ou à la production de chaleur industrielle;

b) elles ne résultent pas du remplacement d'un type de combustible fossile par un autre.

Calcul des objectifs d'économies fondé sur l'exercice financier

9 Les objectifs d'économies au cours de chaque période d'un an que vise un plan d'efficacité énergétique doivent être calculés en fonction de la consommation d'énergie électrique ou de gaz naturel au cours de l'exercice précédent et non de l'année civile précédente.

Rajustement des économies nettes pour les aléas climatiques

10 Les économies nettes sont calculées compte tenu du rajustement pour les aléas climatiques.

2

SECTION 3 – THE PLAN ACHIEVES THE SAVINGS TARGETS THROUGH A NEW APPROACH TO CUSTOMER SEGMENT PROGRAMMING & COMPREHENSIVE ENGAGEMENT

3.1 ACHIEVING THE MANDATED ENERGY SAVINGS

54 Efficiency Manitoba is proposing to reach an annual average energy savings of 1.51
55 percent of electric load and 0.78 percent of the 2017/18 natural gas baseline over the
56 2020/23 period. The achievement of these energy savings will begin the trajectory to
57 satisfy the prescribed 15-year cumulative savings targets. The following tables
58 summarize the energy savings and planned budget associated with the Plan. Annual
59 greenhouse gas (GHG) emission reductions resulting from natural gas energy savings
60 are also provided.

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.

2020/23 EFFICIENCY PLAN- NATURAL GAS PORTFOLIO SAVINGS

	2020/21	2021/22	2022/23	Average
Annual natural gas savings (million m ³)	11.7	12.8	13.2	12.6
Savings as a percent of natural gas volume	0.72%	0.79%	0.82%	0.78%
GHG savings (tonnes CO ₂ e)	22,200	24,200	25,200	23,900

Note: After accounting for electric programming interactive effects.

REFERENCE:

Efficiency Plan p.435 of 591

PREAMBLE TO IR (IF ANY):

“Net savings in the consumption of energy or natural gas count towards the respective savings target established in Section 7 of the Act if the net savings are reasonably attributable to a code, standard or regulation to which Efficiency Manitoba or Manitoba Hydro has made a material contribution to.”

QUESTION:

Identify each code and standard that Efficiency Manitoba will count savings from, provide the year enacted, and provide a fulsome explanation of the contribution made by Efficiency Manitoba or Manitoba Hydro towards the development of the code or standard, including justification that supports Efficiency Manitoba or Manitoba Hydro having made a material contribution.

RATIONALE FOR QUESTION:

RESPONSE:

This revised response is adjusted to provide the updated codes and standards electric energy savings identified in PUB/EM I-28. Please see the updated table below.

The following shows the updated codes and standards electric savings located at page 513 of 591 of the submission in Attachment 3.

EMERGING TECHNOLOGY PROGRAMS			
Emerging Technology	-	1.0	5.9
Subtotal	-	1.0	5.9
Program Impact Totals	285	300	295
Codes, Standards & Regulations	88	103 86	108 82
Total Energy Savings (GW.h) at Generation	373	403 386	408 377

**2020-2023 Efficiency Plan
PUB/EM I-39 (Revised)**

The following table shows the revised codes and standards electric savings as a percent of load. The revised annual electric energy savings that have decreased by 0.05% are still aligned with both the near-term 1.5% annual target and the cumulative 15-year 22.5% electric energy savings target prescribed in The Efficiency Manitoba Act.

Revised Savings as a Percent of Load

	2020/21	2021/22	2022/23	Average
Original value	1.43%	1.55%	1.56%	1.51%
Revised value	1.43%	1.48%	1.45%	1.46%

Efficiency Manitoba plans to continue with the important historical work completed by Manitoba Hydro's Demand Side Management efforts as it relates to the continuation of the strategy to affect change in codes and standards.

Annual forecasted savings from codes and standards can be seen below as per the 2020/23 Efficiency Plan, Appendix A - Section A9, Table A9.1, p.435 of 591.

	Electric savings						Natural gas savings			Date implemented
	2020/21		2021/22		2022/23		2020/21	2021/22	2022/23	
	MW	GWh	MW	GWh	MW	GWh	million m ³	million m ³	million m ³	
Residential Building Code	4.2	16.1	3.8	14.8	3.5	13.6	4.1	4.1	4.0	Various - see descriptions below.
Residential General Service Lighting Standards	7.2	17.1	11.0 3.8	26.1 9.1	13.1 2.1	31.1 5.0	-0.8	-0.4	-0.2	January 2014
Residential Appliance Standards	2.8	17.2	2.4	15.4	2.1	13.7	1.0	0.0	0.0	Various - see descriptions below.
Other residential equipment standards	0.0	3.8	0.0	3.5	0.0	3.2	0.0	0.0	0.0	Various - see descriptions below.
Commercial Building Code	5.6	18.7	8.3	28.1	9.5	31.8	0.5	0.8	0.9	December 2014

**2020-2023 Efficiency Plan
PUB/EM I-39 (Revised)**

	Electric savings						Natural gas savings			Date implemented
	2020/21		2021/22		2022/23		2020/21	2021/22	2022/23	
	MW	GWh	MW	GWh	MW	GWh	million m ³	million m ³	million m ³	
Commercial General Service Lighting Standards	3.1	14.5	3.1	14.5	3.1	14.5	-0.3	-0.3	-0.3	Various - see descriptions below.
Other commercial equipment standards	0.0	0.6	0.0	0.6	0.0	0.5	0.0	0.0	0.0	Various - see descriptions below.
Total Savings	22.9	88.0	21.6	85.9	20.4	82.3	3.5	4.1	4.4	
Total Budget (000's)	\$375		\$382		\$389		\$125	\$127	\$129	

Many Canadian and U.S. electric utilities, including Manitoba Hydro, have been engaged in DSM activities for more than two decades. In addition to utility specific Demand Side Management programs, Manitoba Hydro's historical strategy, being adopted by Efficiency Manitoba, is to affect change in codes and standards by being an aggressive and active participant on several provincial and national energy efficiency codes and standards committees. These codes and standards are subsequently referenced in national and provincial regulations that mandate minimum energy performance levels for a variety of appliances, buildings and other energy consuming measures.

Efficiency Manitoba and energy efficiency staff at Manitoba Hydro currently have representation on both the national Standing Committee on Energy Efficiency (SC-EE) and the national Canadian Standards Association's Steering Committee on the Performance of Energy Efficiency and Renewables (SCOPEER). Efficiency Manitoba, through Manitoba Hydro energy efficiency staff, also has representation on a Task Group¹ that supports the work of SC-EE and six Technical Sub-committees² that support the work of SCOPEER.

¹ National Energy Code for Buildings Building Envelope Task Group

² Existing Building Commissioning for Energy Using Systems (CSA Z5001), Building Energy Systems (CSA TC424), Efficiency Performance Standards for Lighting Technologies (CSA TC419), Thermal Bridging Standard (CSA Z5010), Drain Water Heat Recovery Systems (CSA B55), Industrial Equipment (CSA TC402), Existing building commissioning for energy using systems (CSA Z5001-19)

**2020-2023 Efficiency Plan
PUB/EM I-39 (Revised)**

SC-EE is responsible for recommendations, technical content, and user guides associated with the National Energy Code for Buildings (NECB) and the Energy Efficiency portion of the National Building Code (Section 9.36). SCOPEER provides oversight and guidance for the development of energy performance standards related to electric and fuel-burning equipment used in residential, commercial and industrial applications and buildings.

Efforts by local efficiency staff on these and past committees has been to advance the progress of product efficiency improvements through the development of test methodologies that facilitate measurement and comparison of energy performance and provide for minimum energy performance levels that reasonably represent performance improvements available from commercially viable product advancements, which are then incorporated into Demand Side Management programs, and subsequent energy efficiency regulations and building codes proposed by national and provincial regulators.

Efficiency Manitoba will continue to offer voluntary programs that encourage customers and industry to pursue higher levels of efficiency in advance of the building code cycle or prior to the implementation of energy efficiency regulations on products. These energy efficiency programs are critical to achieving market-readiness for the implementation of new codes or regulations. Program staff work closely with industry to increase awareness and build expertise. The programs promote energy efficiency products and practices which increase the demand for and availability of the products and services in the market. The increased demand and availability also drive down pricing over time, improving the economics of the energy efficiency products and practices. These program efforts ready the market and facilitate a smoother transition and adoption of the building codes and product standards.

Efficiency Manitoba recognizes that having staff participate actively on codes and standards committees as well as promoting energy efficiency and preparing the market through programming ensures an alignment of efforts towards codes and standards. This combined effort by one organization ensures

Descriptions of each of the past codes and standards that have been taken into consideration when developing a forecast for projected savings are found below.

Residential Construction

Building Code

Manitoba Building Code, amendment (PROVINCIAL)

Regulation 4/2008

Registered: January 11, 2008

Effective date: October 1, 2008

Manitoba Hydro has been offering the New Home Program to customers across the province since 2004. The New Home Program promoted and offered incentives to customers for the installation of energy efficient technologies and building practices within the new home construction industry. Local efficiency staff worked closely with industry stakeholders like the Manitoba Home Builders' Association when developing requirements for the program. Specifically, the New Home Program has required and has been promoting a minimum requirement for R20 insulation in the foundation walls of new homes since 2004.

Changes to Table 9.25.5.2. (Minimum Thermal Resistance for the Building Envelope) of the Manitoba Building Code (Regulation 127/2006) came into effect on October 1, 2008. The changes related to the minimum requirement for insulation R-value for the interior and exterior foundation walls of new homes. The code change increased the minimum required insulation value from R12 to R20.

Building Code

Manitoba Building Code, amendment (PROVINCIAL)

Regulation 142/2010

Registered: October 4, 2010

Effective date: December 1, 2010

Manitoba Hydro has promoted energy efficient technologies and building practices within the residential new construction segment through delivery of the New Home Program. When developing program requirements, Manitoba Hydro worked closely with industry stakeholders like the Manitoba Home Builders Association.

Through the delivery of the Gold New Home offering, Manitoba Hydro planned to aid the advancement of future building code by promoting and offering incentives to customers to

**2020-2023 Efficiency Plan
PUB/EM I-39 (Revised)**

build their home with recommended technologies and construction practices. The Gold standard announced in 2007 required the use of heat recovery ventilators (HRV), 94 % AFUE furnaces, electronic ignition for natural gas fireplaces, R50 attic insulation, water efficient fixtures and many other building envelope improvements.

Effective December 1st, 2010, Manitoba implemented changes to the building and plumbing codes that increased energy and water efficiencies. These changes were the result of extensive consultations by the Office of the Fire Commissioner involving new homebuilders, contractors and technical experts with the Sub-committee of the Building Standards Board on Energy Efficiency; which was chaired by a Manitoba Hydro staff person. The new efficiencies incorporated into new construction and homes undergoing extensive renovations included:

- Specifying minimum energy-efficiency requirements for windows,
- Eliminating the pilot light in gas fireplaces,
- Increasing the required level of attic insulation to R50,
- Requiring a minimum 94 per cent fuel-efficiency rating for furnaces,
- Specifying a mid-efficient heat-recovery ventilator, and
- Introducing energy-modeling software that will allow builders to model alternatives to the code requirements.
- Requiring a maximum flow rate for primary showerheads to 1.75 GPM

Through its close working relations with key industry stakeholders and the New Home Program offering, local efficiency staff succeeded in advancing these changes to the Manitoba Building code. In fact, a majority of the technologies adopted by the Manitoba Building Code for the December 1, 2010 update were part of the aforementioned Gold New Home standard requirements. Had local efficiency staff not provided information, education, training, and incentives for these technologies and building practices, the industry would have been less likely to adopt these technologies and transform the market. The program created demand for these technologies, provided builders an opportunity to gain experience using them, and provided trades and contractors training opportunities to advance their expertise and knowledge of the technologies.

Building Code

Manitoba Building Code, amendment (PROVINCIAL)

Regulation (Proposed)

Effective date: 2020

Efficiency Manitoba's New Homes Program will promote and offer incentives to customers for the installation of energy efficient technologies and building practices within the new home construction industry. Efficiency Manitoba will work closely with industry stakeholders with the aim to build market acceptance for ease of adoption in the Manitoba Building Code in 2020.

Residential Lighting

General Service Lamps

National Resources Canada (FEDERAL)

Amendment 12B to Energy Efficiency Regulations

Published: January 15, 2014 (Canada Gazette Part II)

Effective date(s):

January 1st, 2014 - 75 to 100 watt equivalent lamps

December 31st, 2014 - 40 to 60 watt equivalent lamps

The Government of Canada announced in Amendment 12B to the Energy Efficiency Regulations, published on January 15, 2014 that they would introduce Minimum Energy Performance Standards (MEPS) for general service lamps in 2012. The consequent Regulations came into force in December 2013 and applied to 100 and 75 W bulbs manufactured on or after January 1, 2014, and to 60 and 40 W bulbs manufactured on or after December 31, 2014. The Regulations prohibit the importation and interprovincial shipment of non-compliant products. The Regulations provide for a number of alternatives to inefficient bulbs. Where no alternatives exist, exemptions are made.

Residential Appliances

Local efficiency staff are key players on the Canadian Standards Association's Strategic Steering Committee on Performance, Energy Efficiency and Renewables (SCOPEER). This committee is responsible for changes to provincial and national performance standards and legislation which have resulted in the improvement of energy utilization of numerous appliances such as dishwashers, clothes washers & dryers, refrigerators and freezers, and ranges/stoves/cooktops.

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Each year, new products are added to Energy Efficiency Regulations through the work of SCOPEER.

Other Residential EquipmentCentral Air Conditioning

National Resources Canada (FEDERAL)

Amendment 9 to Energy Efficiency Regulations

Test Standard: CAN/CSA-C656-05

Published: November 15, 2006 (Canada Gazette Part II)

Effective date(s): November 15, 2006

In November 2006, the CSA published a standard (C656-05) which specified mandatory MEPS applied to permanently installed 'air-source' air-conditioner and heat pumps. Equipment types include air conditioners and heat pumps that are single package and split system, single and three-phase, with rated capacity of less than 19 kW (65,000 Btu/h). For air conditioners, a minimum SEER rating of 13 was mandated.

Historically, Manitoba Hydro provided a fixed interest finance plan that could be used for renovations including central air, mid-efficient natural gas/electric furnaces and water heaters, direct vent natural gas fireplaces, security lights and fixtures under the Energy Finance Plan. Pre 2005, a minimum SEER rating of 10 for Air Conditioners was required for eligibility for financing under the plan. In order to comply with the forthcoming national standard, Manitoba Hydro raised the minimum SEER to 13 for eligibility of financing in October 2005; approximately one year earlier.

Residential High Efficiency Furnace

National Resources Canada (FEDERAL)

Amendment 10 to Energy Efficiency Regulations

Published: December 24, 2008 (Canada Gazette Part II)

Effective date: December 31, 2009

On December 12, 2008 the Federal Government amended the Energy Act to require increased efficiency requirements for replacement gas (natural gas and propane) furnaces and boilers.

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Effective December 31, 2009 replacement furnaces up to 225 000 Btu/h sold in Canada are required to have a minimum AFUE of 90%.

Local efficiency staff played a material role in the amendment of the Federal Energy Act. Local efficiency staff assisted the Federal Government by providing technical and market data regarding the heating market in Manitoba and comments to the proposed Amendment during the consultation process. Demand Side Management programs such as the Residential Loan and the High Efficiency Furnace and Boiler Rebate influenced the Manitoba market to the point that 80% of all equipment installed in 2009 was high efficiency products, thus making the Amendment acceptable to the industry and to consumers.

The Energy Act (PROVINCIAL)

Regulation 181/2009

Published: November 12, 2009

Effective date: December 30, 2009

On November 12, 2009 the Manitoba Government passed a regulation under the Energy Act to require increased efficiency requirements for replacement gas (natural gas and propane) furnaces and boilers. Effective December 30, 2009 replacement furnaces up to 225 000 Btu/h sold in Manitoba are required to have a minimum AFUE of 92%.

Local efficiency staff played a major role in the development of the Provincial Regulation. Local efficiency staff assisted the Province by providing technical and market data regarding the heating market, hosting an industry consultation with contractors and other interested parties, preparing a formal market impact study, and providing general guidance to regulatory staff. Demand Side Management programs such as the Residential Loan and the High Efficiency Furnace and Boiler Rebate influenced the market to the point that 80% of all equipment installed in 2009 was high efficiency products, thus making regulation acceptable to the industry.

Commercial Building Code

Manitoba Energy Code for Buildings (MECB) – enacted 2014

The national commitment to update the 1997 Model National Energy Code for Buildings (MNECB) was initiated in Manitoba by the Energy Code Advisory Committee (ECAC) which was led by Manitoba Hydro efficiency staff. Manitoba Hydro efficiency staff also chaired the national Building Energy Code Collaborative (BECC), which was formed in response to the recommendations provided by ECAC.

As a result of the work done by BECC, formal support was provided by jurisdictions across Canada to undertake the work to update the 1997 MNECB and a national working group was formed to conduct the detailed work for updating the code. Manitoba's Minister of Labour provided formal support that signaled Manitoba's intention to adopt the document once published, however the Province still moved forward with their own energy strategy and convened a sub-committee of the Building Standards Board of Manitoba to recommend Manitoba-based energy and water efficiency recommendations that could be implemented in advance of the release of the revised NECB.

In January 2011, the energy efficiency amendments developed for the Manitoba building code were approved by the Building Standards Board of Manitoba and the Minister of Labour. However, with the NECB already through its public consultation phase and targeting a release date of Fall 2011, it was decided to hold back on regulating the specific Manitoba amendments so that a review and implementation of the NECB could be implemented. The sub-committee that developed the Manitoba amendments was reconvened in fall of 2012 with the task of reviewing the NECB and determining its applicability to the Manitoba market. Once again, local efficiency staff played a key role contributing to this process. The sub-committee provided a recommendation that was formally adopted with minor adjustments in the December of 2013 for implementation and enforcement in December of 2014. The result was the enactment of the MECB.

Since this first enactment of an energy code for new commercial construction in the province, local efficiency staff have contributed to the national process for the development of the 2015, 2017, and 2020 editions of the NECB and several local efficiency staff formally attend regular code development meetings to ensure energy efficiency objectives are met.

Commercial General Service Lighting Standards

Since 1992, Manitoba Hydro had been actively promoting energy efficient lighting technologies for commercial applications. Activities involved in developing lighting standards include:

- Collaboration with other utilities, identify necessary research
- Work with Canadian Electrical Association
- Liaise with manufacturers to encourage the development and improvement of energy efficient lighting
- Product testing
- Liaise with National Research Council
- Participation on the CSA Standards Setting Committee
- Participation on the Canadian Lighting Industry Collaborative

General Service Lamps

National Resources Canada (FEDERAL)

Amendment 12B to Energy Efficiency Regulations

Published: January 15, 2014 (Canada Gazette Part II)

Effective date(s):

January 1st, 2014 - 75 to 100 watt equivalent lamps

December 31st, 2014 - 40 to 60 watt equivalent lamps

The Government of Canada announced in Amendment 12B to the Energy Efficiency Regulations, published on January 15, 2014 that they would introduce Minimum Energy Performance Standards (MEPS) for general service lamps in 2012. The consequent Regulations came into force in December 2013 and applied to 100 and 75 W bulbs manufactured on or after January 1, 2014, and to 60 and 40 W bulbs manufactured on or after December 31, 2014. The Regulations prohibit the importation and interprovincial shipment of non-compliant products. The Regulations provide for a number of alternatives to inefficient bulbs. Where no alternatives exist, exemptions are made.

Exit Signs

National Resources Canada (FEDERAL)

Amendment 8 to Energy Efficiency Regulations

Test Standard: CAN/CSA-C860-01

Published: September 22, 2004 (Canada Gazette Part II)

Effective date: November 1, 2004

In September of 2004, Natural Resources Canada's (NRCan's) Office of Energy Efficiency (OEE) amended Canada's Energy Efficiency Regulations (the Regulations) in order to strengthen the minimum energy performance standard for internally lighted exit signs with the publication of Amendment 8 in Canada Gazette Part II. This standard contains voluntary minimum performance standards of 22 watts for signs 120 V or less, and 27 watts for signs greater than 120 V. These levels were harmonized with the National Building Code of Canada. The standard also addresses the visibility performance of the exit sign. To meet these standards, typically requires that LED technology be employed. In the area of LED lighting, the program supported these minimum efficiency levels for new exit signs with signs set at a level that only LED exit signs could meet.

Fluorescent lamp ballasts

National Resources Canada (FEDERAL)

Amendment 9 to Energy Efficiency Regulations

Test Standard: CAN/CSA-C654-M91

Published: November 15, 2006 (Canada Gazette Part II)

Effective date(s):

November 15th, 2006 (New Construction Market)

April 1st, 2010 (Renovation Market)

In November of 2006, Natural Resources Canada's (NRCan's) Office of Energy Efficiency (OEE) amended Canada's Energy Efficiency Regulations (the Regulations) in order to strengthen the minimum energy performance standard for florescent lamp ballasts with the publication of Amendment 9 in Canada Gazette Part II. Manitoba Hydro's Commercial Lighting Program helped support this Federal code change that required fluorescent lamp ballasts meet a prescribed minimum energy performance standard in the new construction market in 2006 and the renovation market in 2010.

Other commercial equipment standards

Commercial Pre-Rinse Spray Valve

Manitoba Plumbing Code

Regulation 32/2011

Adoption of National Plumbing Code of Canada 2010

Published: March 28, 2011 The Buildings and Mobile Homes Act (C.C.S.M. c. B93)

Effective date: April 1, 2011

On April 1, 2011 the Manitoba Government repealed the Manitoba Plumbing Code, Manitoba Regulation 128/2006 and adopted the National Plumbing Code of Canada 2010 issued by the Canadian Commission on Buildings and Fire Codes, National Research Council Canada. The code states that the maximum flow rate for a pre-rinse spray valve not exceed 6.1 litres per minute (1.60 gallons per minute). The Manitoba Hydro Rinse & Save Program influenced market adoption; converting the Manitoba market to pre-rinse spray valves with equal or higher energy efficiency than the code. Manitoba Hydro's involvement expedited market transformation and thus facilitated the adoption of the code.

Commercial Boilers

National Resources Canada (FEDERAL)

Bulletin published: August 2010

Test Standard: HI BTS 2000, Rev 06.07 Method to Determine Efficiency of Commercial Space Heating Boilers

Proposed Effective date(s):

2020/23 Efficiency Plan planning horizon

In August of 2010, Natural Resources Canada's (NRCan's) Office of Energy Efficiency (OEE) Natural Resources Canada (NRCan) proposed to amend Canada's ENERGY EFFICIENCY REGULATIONS (the Regulations) to require dealers to comply with minimum energy performance standards (MEPS) for commercial gas and oil-fired boilers, imported or shipped inter-provincially, for sale or lease in Canada. NRCan proposed that commercial packaged boilers meet minimum efficiency ratings of 90% for the new construction market and 85% for the replacement market. NRCan has postponed changes to minimum energy performance standards numerous times since August 2010, however they are anticipated to move forward within the timeframe of the 2020/23 Efficiency Plan.

REFERENCE:

Efficiency Plan p.61, 227 of 591

PREAMBLE TO IR (IF ANY):**QUESTION:**

Explain how the Plan addresses interactive effects (i.e. additional electricity consumption) with respect to electrically heated homes and businesses (i.e. an LED light bulb or a retired fridge provides would not be expected to provide net savings during the heating season as additional electric heating is required).

RATIONALE FOR QUESTION:**RESPONSE:**

The installation of electric energy efficient measures generally results in a reduction in the amount of waste heat generated by the measure. This reduction in waste heat results in an increased heating requirement and a decreased cooling requirement. For facilities and homes heated by electricity, the increased electric heating requirements are subtracted from the electric measure savings. For facilities and homes that are electrically cooled, the decreased cooling requirements are added to the measure savings. The net measure savings after considering the estimated heating and cooling interactive effects are used in the measure forecasts in the 2020/23 Efficiency Plan.

REFERENCE:

Efficiency Plan p.21, 148-150, 161-162, 165-166, of 591

PREAMBLE TO IR (IF ANY):

QUESTION:

- a. In a table, compare the Plan spending totals on electricity programs with the forecasted and actual spending for 2015/16, 2016/17, and 2017/18, broken down by customer segment. For each prior forecast year, use the Manitoba Hydro Power Smart Plan with the most recent forecast for that year. Present the response in a table similar to the one below:

Spending	Efficiency Manitoba Plan	2015/16		2016/17		2017/18	
		Average	Forecast	Actual	Forecast	Actual	Forecast
Residential (excl. AEP)							
AEP/Income Qualified/Indigenous							
Commercial (incl. Agricultural)							
Industrial							
Emerging Technology							
Total							

- b. Provide a table similar to (a) for gas programs.

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- c. In a table similar to (a), compare the Plan savings totals from electricity programs with the forecasted and actual savings for 2015/16, 2016/17, and 2017/18, broken down by customer segment.
- d. Provide a table similar to (c) for gas programs.

RATIONALE FOR QUESTION:**RESPONSE:**

While preparing the response to this interrogatory, Efficiency Manitoba identified a data input error. This resulted in an overstatement of electric energy savings from residential general service lighting standards of 43 GWh over the three years of the Plan. The revised electric energy savings in the 3-year Plan represent an average of 1.46% of the electric load. Efficiency Manitoba is confident that the flexibility of the Plan will allow for modifications to the offerings to enable the achievement of the 1.5% target.

This revision impacts the response to PUB/EM I-39 and the electric energy savings in Attachment 3. Please see the revised response to PUB/EM I-39 for the updated information.

- a) The following table compares the 3-year average electric budget for the Plan to the forecast and actual electric spending from the 2015/16, 2016/17 and 2017/18 Manitoba Hydro DSM plans.

REFERENCE:

PUB Report on the Needs For and Alternatives To Review, June 2014, pdf pages 33-34 of 306.
Available online: http://www.pubmanitoba.ca/v1/nfat/pdf/finalreport_pdp.pdf

PREAMBLE TO IR (IF ANY):

The PUB concluded in the NFAT review that “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” and “The effectiveness of integrated resource planning in determining least-cost combinations of resources cannot be overestimated.”

QUESTION:

- a. Please provide an analysis of conservation measures as an energy resource competitive with other generation resources and indicate which generation resources are included in the evaluation including the amount of deferral or cancellation achieved by the 3-year Plan.
- b. Please provide all relevant references to the deferral of capital investment in respect of electrical infrastructure relied upon by EM in developing the Plan. For example, please indicate the extent to which EM reviewed and considered Manitoba Hydro’s updated resource planning documents. Please provide a copy of the resource planning documents that were reviewed.
- c. Please provide an alternative analysis of the long-term resource planning impact of conservation measures should EM target a 1% energy savings for the foreseeable future (should the LG-in-C, on the advice of the PUB, amend the short-term savings target per Section 38(1) of the Efficiency Manitoba Act).
- d. Given EM’s plan targets 1.51% savings over the three years, please explain all reasons that EM chose to ignore the flexibility per the Act section 7 which prescribes only that the 1.5% target be met over the first 15-year period, and explain how EM assessed the appropriate timing and resulting cost-effectiveness impacts over the entire 15 year period to achieve targeted savings.

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- e. Please indicate all activities planned or anticipated by EM in respect of the Efficiency Manitoba Regulations, Section 8(1)(d) to make a material contribution towards a rate design for Manitoba Hydro, and the expected activities during the upcoming 3-year period to secure savings through such rate design changes.
- f. If the determination was made that the LRI must be maintained to a rate impact of zero at worst (a net rate reduction preferable), what redesign would be necessary to the 3-year Plan, and what savings target could be achieved (if not 1.5%). Would the result be the same if the RIM test was required to meet the same conclusion re: no adverse rate impact arising from the 3-year program?
- g. Please reconcile the statements at pdf page 29 of 591 that the average annual bill savings will be \$14.9 million but that the 30-year NPV of savings will be \$434 million (which is nearly the full value of \$14.9 million times 30 years, without any discounting). Please provide all values in support of the calculations, by year.
- h. The figure provided on pdf page 31 of 591 compared EM efficiency targets in relation to New Brunswick and Nova Scotia, among others. Please provide the dates of next needed generation for energy purposes each of Manitoba, New Brunswick and Nova Scotia per the latest resource planning reviews in each jurisdiction.
- i. Please provide a copy of the Electric Program Cost-Effectiveness Metrics Table (pdf page 516 of 591) that includes Codes and Standards in the ratio, NPV and levelized costs of each program.
- j. Please provide a copy of Manitoba Hydro's latest long-term load forecast.
- k. In relation to the Efficiency Manitoba Regulation, the Manitoba Government Regulatory Accountability Impact Analysis (RAIA) is provided at <https://reg.gov.mb.ca/detail/1871706>. Please provide a copy of the RAIA for the proceeding record.
- l. As referenced in part (k) above, specifically, under the Impacts section of the RAIA, in Anticipated Short and Long-Term Regulatory Benefits, it's stated that the 'efficiency plan will help Manitoba Hydro counter growing demand for electricity and defer the need for Keeyask-like generation developments far off into the future.' Please indicate whether the EM plan supports or is necessary to achieve the deferral of need for Keeyask-like generation, specifically noting the date for when the next Keeyask-like development is needed absent the 3-year Plan.
- m. In regard to the RAIA, a Public Policy Objective of the Regulatory Project Problem or Opportunity is described as, "his is considered an opportunity as it fulfills government

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commitments and creates a platform for more aggressive DSM programs that will help defer costly new electricity generation and help mitigate the impact of electricity rate increases that have intensified because of growing Manitoba Hydro debt. “

Please provide a detailed analysis whether and how the 3-year Plan will “help mitigate the impact of electricity rate increases that have intensified because of growing Manitoba Hydro debt”. Please address the impact of EM’s plan on mitigating rate increases for ratepayers as a result of both this 3 year plan and longer-term, as well as the impact of EM’s plan on Manitoba Hydro’s growing debt.

- n. Regarding part (m) above, please explain the steps EM has taken to assess and consider ratepayer impacts as a result of efficiency spending, not just ratepayers who participate in EM’s efficiency programming.

RATIONALE FOR QUESTION:

MIPUG wishes to understand the impacts on ratepayers as a result of EM’s plan, including assessment of the level of targeted savings each year and impacts on deferred capital expenditures and energy supply competitiveness.

RESPONSE:

- a. Efficiency Manitoba does not possess information to analyze resource planning and is unable to answer this information request.
- b. Efficiency Manitoba does not possess information to analyze resource planning and is unable to answer this information request.
- c. Efficiency Manitoba does not possess information to analyze resource planning and is unable to answer this information request.
- d. Section 7(1) of the Efficiency Manitoba Act states the following with respect to Initial savings targets:

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In the initial year following the commencement date, net savings that are at least equal to 1.5% of the consumption of electrical energy in the preceding year.

In each of the following years, incremental net savings that are at least equal to 1.5% of the consumption of electrical energy in the immediately preceding year.

Efficiency Manitoba does not agree with the supposition within this question that this Section 7 of The Efficiency Manitoba Act implies flexibility with regards to the achievement of the annual savings target.

- e. Please see response for PUB/EM I-1b. The Efficiency Manitoba Regulation 8 (1) d) outlines that net savings from a rate can be counted towards the targets as long as these savings are reasonably attributable to a rate to which Efficiency Manitoba has made a material contribution. The development of a conservation or inverted block rate initiative would be led by Manitoba Hydro and supported by Efficiency Manitoba. A rate initiative was not included in the 2020-2023 DSM Plan, but one may be explored with Manitoba Hydro in future plans.
- f. The proposed LRI target would require amendment to The Efficiency Manitoba Regulation. This Information Request requires a scenario analysis that cannot be completed by Efficiency Manitoba with reasonable effort in the time available.
- g. The NPV of the bill savings amount used in the 2020/23 Efficiency Plan considers the cumulative annual bill savings for the 2021/22 and 2022/23 years that then decrease over the 30-year discount period based on measure life. To illustrate, using the annual average customer bill savings of \$14.9 million in 2020/21 would yield an annual cumulative bill savings amount of \$29.8 million in 2021/22 and finally a cumulative bill savings amount of \$44.7 million in 2022/23. Efficiency Manitoba has provided the corresponding electronic workpapers to Daymark to enable a detailed review of the Efficiency Plan based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark.
- h. Efficiency Manitoba does not possess information to analyze resource planning in Manitoba, New Brunswick or Nova Scotia and is unable to answer this information request

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- i. The costs of Codes & Standards are included within Enabling Strategies and incorporated at the Portfolio Level metrics included in the Electric and Natural Gas Program Cost-Effectiveness Metrics. Including the benefits resulting from the energy savings of Codes & Standards would serve to lower the PACT levelized costs (improve the PACT ratio) associated with both the electric and natural gas portfolios. The requested analysis does not exist and would require analysis which cannot be produced with reasonable effort in the time available.
- j. Please see the response to Coalition/EM I – 1 a).
- k. The Regulatory Accountability Impact Analysis (RAIA) Parts I and II for the newly created Efficiency Manitoba Regulation is available online at the Manitoba Regulatory Consultation Portal found on the Government of Manitoba website.
<https://reg.gov.mb.ca/detail/1871706>
- l. The RAIA is not a document that was produced by Efficiency Manitoba. Efficiency Manitoba does not possess information to analyze resource planning and is unable to answer this information request.
- m. The RAIA is not a document that was produced by Efficiency Manitoba. Efficiency Manitoba does not possess information to analyze neither either resource planning nor Manitoba Hydro's financial status and is unable to answer this information request.
- n. As per page 27 of 591 of the Plan, Efficiency Manitoba has used the Lifecycle Revenue Impact (LRI) to assess impacts as a result of efficiency spending for all ratepayers.

3

REFERENCE:

Efficiency Plan p.223-225 of 591; 2018 Manitoba Hydro Electric Load Forecast; 2018 Gas Volume Forecast; Efficiency Manitoba Act s.7

PREAMBLE TO IR (IF ANY):

“For 2021/22 and 2022/23 years, an adjustment is also made to the load forecast to remove energy savings from prior DSM activity (example 2020/21) included within the Plan.”

Manitoba Hydro’s load forecast does not include DSM savings in forecast years: “DSM savings arising from future program-based offerings incremental to the above mentioned Codes and Standards are not reflected in this forecast. They are accounted for separately in Manitoba Hydro’s DSM Plan and Power Resource Plan.”

QUESTION:

- a. When establishing the electricity savings target, explain the adjustment that Efficiency Manitoba is making to remove DSM savings from the 2018 electric load forecast.
- b. Explain why electricity savings are being calculated at generation and not at the meter, consistent with prior Manitoba Hydro Power Smart and DSM Plans.
- c. With reference to the tables in the 2018 Electric Load Forecast, identify where the reference electric loads in Table A2.1 are found or how they are derived. File the relevant tables from the 2018 Electric Load Forecast.
- d. With reference to the tables in the 2018 Gas Volume Forecast, identify where the reference electric loads in Table A2.2 are found or how they are derived. File the relevant tables from the 2018 Gas Volume Forecast.
- e. Considering the 2018 Electric Load Forecast predicts General Consumers Sales growth (not including DSM impacts) to be 1.0% in 2021/22 and 1.1% in 2022/23, and with savings targets of 1.5% annually, explain why the reference electric loads in Table A2.1 are not declining by approximately 0.4% to 0.5% annually.
- f. Confirm whether the electric load to serve the Diesel Zone customers is included in the reference electric loads in Table A2.1. If not confirmed, explain why not.

RATIONALE FOR QUESTION:**RESPONSE:**

Manitoba Hydro's 2018 Electric Load Forecast is publicly available at the link below.

https://www.hydro.mb.ca/docs/regulatory_affairs/pdf/electric/electric_rate_application_2019/15_appendix_15_-_2018_electric_load_forecast.pdf

The following is a link to Manitoba Hydro's Annual Report for the year ended March 31, 2018.

https://www.hydro.mb.ca/corporate/ar/pdf/annual_report_2017_18.pdf

- a. Please refer to the table provided below. The Manitoba Hydro 2018 Electric Load Forecast (Table 7, gross firm energy, p. 21 of 88) includes the forecast load reductions from future DSM savings associated with existing Provincial building codes and improved equipment efficiency standards and regulations (codes and standards). As shown in the table provided and in order to establish an appropriate base electric load for the percent of load calculation to following adjustments are needed:
 - the projected cumulative 2018 DSM codes and standards savings must be added. This prevents the double-counting of codes and standards savings. See PUB/EM I-26b for the 2016/17 Power Smart Plan - 15-year Supplement (from codes & standards savings found on p. 86 of 128);
 - An adjustment is also made to the load forecast to remove energy savings from prior DSM savings. See PUB/EM I-26e for the 2019/20 DSM Plan (p. 21 of 72); and
 - Since the base electric load forecast does not include projected Efficiency Manitoba DSM savings, activity from the 2020/23 Efficiency Plan ("Plan") needs to be removed in subsequent years to reflect projected energy savings.

Once the base electric load is established, electric energy savings targets are calculated as the percentage of the prior year's forecasted electric load.

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.

- b. Electricity savings in the 2020/23 Efficiency Plan are being calculated at generation. This is consistent with prior Manitoba Hydro Power Smart and DSM Plans which were also reported at generation.
- c. Please see PUB/EM I-45a.
- d. Please refer to the table provided below. The 2017/18 reference natural gas million (million m³) volume in Table A2.2 of the 2020/23 Efficiency Plan, Section A2, p. 225 of 591, can be derived by referencing the Manitoba Hydro 2017/18 annual report (PDF p. 107 of 110), table “Natural Gas Revenues and Deliveries”. This value is then used as a proxy natural gas forecast value to use publicly available information. This delivery value is then adjusted consistent with the “consumption” definition contained within the Act. As shown in the table provided and in order to establish an appropriate reference natural gas volume for the percent of load calculation to following adjustments are needed:

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- Natural gas consumption used as an input to industrial production and natural gas used to generate electric power were removed as per the description for “consumption” provided in Section 2 of the Efficiency Manitoba Act;
- An adjustment is also made to the natural gas volumes to remove energy savings from prior DSM savings. See PUB/EM I-26e for the 2019/20 DSM Plan (p. 21 of 72); and
- Since the base natural gas volume does not include projected Efficiency Manitoba DSM savings, activity from the 2020/23 Efficiency Plan (“Plan”) needs to be removed in subsequent years to reflect projected energy savings.

Once the base natural gas volume is established, natural gas energy savings targets are calculated as the percentage of the prior year’s forecasted natural gas volume.

Natural Gas Forecast Year	2019/20	2020/21	2021/22
2017/18 actual natural gas consumption (million m³)	2,048	2,048	2,048
Less: Adjustment from Section 2 of the EM Act			
2017/18 adjusted natural gas consumption (million m³)			
Less: 2019/20 DSM Plan (million m³)	8.0	8.0	8.0
Less: Cumulative EM Plan savings (million m³)	-	11.7	24.5
2017/18 reference natural gas volume (million m³)	1,632	1,621	1,608
Table A2.2	2020/21	2021/22	2022/23
2017/18 reference natural gas volume (million m³)	1,632	1,621	1,608
Target percent of load	0.75%	0.75%	0.75%
Natural gas savings required to achieve target (million m³)	12.2	12.2	12.1

2b & 4a

Note: Total may not add up exactly due to rounding.

- The approach taken to determine the electric energy savings targets is shown in PUB/EM I-45a. Efficiency Manitoba did not use General Consumers Sales growth in the derivation of the electric energy savings targets.

- f. The electric load to serve diesel zone customers is not included in the reference electric loads in Table A2.1 since this electric consumption is not included within in the gross firm energy at generation, which is used by Efficiency Manitoba to calculate the percentage of load (as shown PUB/EM I-45a).

REFERENCE:

13 and 15-16 (PDF 58 and 60-61)

20-21 (PDF 223-224)

PREAMBLE TO IR (IF ANY):

Section 2 of the Efficiency Manitoba Act states:

“consumption means, on a weather-adjusted basis,

(a) for electrical energy, electrical energy that is metered and sold to a customer in Manitoba”

Section 7 (1) of the Efficiency Manitoba Act states

“Subject to the regulations, the annual savings targets that Efficiency Manitoba is responsible for meeting in the 15-year period following the commencement date are as follows:

Electrical Energy

In the initial year following the commencement date, net savings that are at least equal to 1.5% of the consumption of electrical energy in the preceding year.

In each of the following years, incremental net savings that are at least equal to 1.5% of the consumption of electrical energy in the immediately preceding year.”

Section A2 (page 20) of the Application states:

“The publicly available Manitoba Hydro 2018 Electric Load Forecast was used to provide the estimated future energy consumption, which identifies annual electric consumption (in GWh) at the point of generation”.

QUESTION:

- a) Please provide, for the record in this proceeding, a copy of the Manitoba Hydro 2018 Electric Load Forecast used as the basis for determining the electric energy savings targets.
- b) Please confirm that the values used for setting the 2020/21, 2021/22 and 2022/23 targets were based on forecasts for the years 2019/20, 2020/21 and 2021/22

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respectively. If not, please explain why given the targets are to be based on “the consumption of electrical energy in the preceding year”.

- c) It is noted that Section 2 of the Efficiency Manitoba Act defines consumption as “electrical energy that is metered and sold to a customer in Manitoba”. Do the Manitoba Hydro 2018 Electric Load Forecast values used include Construction Power and/or Station Service (discussed on pages 37 and 40 of the Load Forecast document)? As part of the response please indicate how the inclusion/exclusion of Station Service and Construction Power aligns with the Act’s definition of consumption as being electrical energy that is “metered” and “sold to a customer”.
- d) It is noted that Section 2 of the Efficiency Manitoba Act defines consumption as “electrical energy that is metered and sold to a customer in Manitoba”. Do the Manitoba Hydro 2018 Electric Load Forecast values used include forecast sales related to i) Residential Flat Rate Water Heaters (page 20 of the Load Forecast document); ii) Commercial Flat Rate Water Heaters (page 26 of the Load Forecast document) or iii) Lighting (page 30 of the Load Forecast document). As part of the response please indicate how the inclusion/exclusion of these items aligns with the Act’s definition of consumption as being electrical energy that is “metered” since in all three instance some if not all of the electrical energy is not metered.

RATIONALE FOR QUESTION:

To understand the basis for the determination of the annual targets used for electrical energy and how they align with the requirements of the Act.

It is noted that PUB-EM-45a) and 46 were reviewed and this question was revised to remove duplication.

RESPONSE:

- a) The requested document is provided in PUB/EM I-45.
- b) Confirmed.

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- c) Requested information is not within the knowledge of Efficiency Manitoba. As shown in PUB/EM I-45a Efficiency Manitoba uses the gross firm energy at generation to calculate the annual electric energy savings percentage of load.

- d) Requested information is not within the knowledge of Efficiency Manitoba. As shown in PUB/EM I-45a Efficiency Manitoba uses the gross firm energy at generation to calculate the annual electric energy savings percentage of load.

performance of Efficiency Manitoba. The following sections look at Efficiency Manitoba's approach in both regards.

3.1.1 Planning Targets

The Efficiency Manitoba Act sets out the annual savings targets that Efficiency Manitoba is responsible for meeting as follows¹⁷:

Subject to the regulations, the annual savings targets that Efficiency Manitoba is responsible for meeting in the 15-year period following the commencement date are as follows:

Electrical Energy

In the initial year following the commencement date, net savings that are at least equal to 1.5% of the consumption of electrical energy in the preceding year. In each of the following years, incremental net savings that are at least equal to 1.5% of the consumption of electrical energy in the immediately preceding year.

Natural Gas

In the initial year following the commencement date, net savings that are at least equal to 0.75% of the consumption of natural gas in the preceding year. In each of the following years, incremental net savings that are at least equal to 0.75% of the consumption of natural gas in the immediately preceding year.

In its proposed Plan, Efficiency Manitoba has calculated the values for the electricity targets for 2020/21, 2021/22 and 2022/23 as follows¹⁸:

- Start with the forecast values for electric use at point of generation from Manitoba Hydro's 2018 Load Forecast;
- Adjust for DSM savings not accounted for in the Load Forecast; and
- Multiply by the 1.5% savings target

¹⁷ Section 7.1

¹⁸ Section A2, page 20 and PUB/EM I-45 a)

The following Table sets out the derivation of the required savings in each year based on the 1.5% savings target.

Table 1 – Derivation of Electric Target Values

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.

In the Plan the values for the natural gas targets for 2020/21, 2021/22 and 2022/23 have been calculated as follows:

- Start with the 2017/18 actual natural gas volume consumption per Manitoba Hydro's 2017/18 Annual Report;
- Adjust this value consistent with the definition of "consumption" as contained in the Efficiency Manitoba Act;
- Adjust for natural gas savings attributable to the Plan; and
- Multiply by the 0.75% savings target.

The following Table sets out the derivation of the required savings in each year¹⁹.

¹⁹ Appendix A, Section A2, pages 21-22 and PUB/EM I-45 a)

Table #2 – Derivation of Natural Gas Target Values

Natural Gas Forecast Year	2019/20	2020/21	2021/22
2017/18 actual natural gas consumption (million m ³)	2,048	2,048	2,048
Less: Adjustment from Section 2 of the EM Act			
2017/18 adjusted natural gas consumption (million m ³)			
Less: 2019/20 DSM Plan (million m ³)	8.0	8.0	8.0
Less: Cumulative EM Plan savings (million m ³)	-	11.7	24.5
2017/18 reference natural gas volume (million m ³)	1,632	1,621	1,608
Table A2.2	2020/21	2021/22	2022/23
2017/18 reference natural gas volume (million m ³)	1,632	1,621	1,608
Target percent of load	0.75%	0.75%	0.75%
Natural gas savings required to achieve target (million m ³)	12.2	12.2	12.1

Note: Total may not add up exactly due to rounding.

Comments

With respect to the electric target calculation, the Act specifies that net savings are to be equal to at least “1.5% of the consumption of electrical energy in the preceding year”. For purposes of the 2020/21-2022/23 Plan this would be the years 2019/20 to 2021/22 respectively. Since the actual values for these years are not yet known, Efficiency Manitoba’s approach of relying on the most recently available forecast values for electricity is reasonable. It should be noted that the forecast values are “weather normal” values as required by the Act²⁰. It is also noted that Efficiency Manitoba has indicated²¹ it will utilize weather normalized actual electricity consumption defined and provided by Manitoba Hydro to verify actual achievement of energy savings targets. However, the forecast values used are based on electricity volumes measured at the point of generation as opposed to the point of delivery to customer and, as a result include transmission and distribution losses where applicable. Furthermore, the forecast values include electricity used by Manitoba Hydro for Station Service and

²⁰ Section 2 of the Act defines consumption as being on a “weather-adjusted” basis.

²¹ PUB/EM I-42 a)

Construction Power²². In contrast, the *Act* clearly defines²³ consumption in the case of electrical energy as “*electrical energy that is metered and sold to a customer in Manitoba*”. Based on this definition the values used should not include Station Service and Construction Power as the associated electrical energy is not “sold to a customer”. Furthermore it is questionable whether the consumption values should be “measured” at point of generation or at the point of delivery (i.e., the customer’s meter). Finally, the Gross Firm Energy values include sales to customers, such as street lighting, which are not metered and therefore are not included in the definition of consumption as set out in the *Act*.

Efficiency Manitoba was asked about these inconsistencies during the interrogatory process. In the case of Station Service, Construction Power and customers’ unmetered loads Efficiency Manitoba responded that the “requested information is not within the knowledge of Efficiency Manitoba”²⁴. With respect to the use of electrical energy measured at the point of generation, Efficiency Manitoba’s explanation²⁵ was that “this is consistent with prior Manitoba Hydro Power Smart and DSM Plans which were also reported at generation”. Efficiency Manitoba has also indicated that using comparable customers’ meter values will not yield any difference to the resulting electric portfolio included in the Plan²⁶. The question as to whether the targets can be set using an approach different from that set out in the *Act* is a legal matter. However, from a process perspective what is important is that the approach to setting the target savings values be transparent and that any apparent deviations from the statutory requirements be clearly documented. In this regard, the current Plan is deficient as it did not identify and, to date, has not explained the inconsistencies between the Gross Firm Energy values it used for purposes of determining the electrical energy target values and “electrical energy that is metered and sold to a customer” as required by the *Act*.

²² Efficiency Manitoba has indicated (PUB/EM I-45 a)) that the 2018 Load Forecast values are taken from Table 7 of Manitoba Hydro’s 2018 Load Forecast. Inspection of that table demonstrates that the Gross Firm Energy values used include both Station Service and Construction Power.

²³ Section 2

²⁴ Coalition/EM I-1 c) & d)

²⁵ PUB/MH I-45 b)

²⁶ Coalition/EM I-49 b)

Manitoba Hydro's 2018 Load Forecast includes the impact of DSM programs and Codes and Standards implemented in the years 2017/18 and earlier²⁷. In the case of Codes and Standards, this also includes the impact they will have on incremental load (e.g., new buildings) occurring after 2017/18. As a result, it is necessary to adjust the forecast values for 2019/20 through 2021/22 for the impact of DSM programs that have/will be implemented in subsequent years and to also adjust for the further impacts Codes and Standards will have on customers' consumption in those years. In the case of DSM programs this would include the impact of DSM programs implemented by Manitoba Hydro in the years 2018/19 through 2019/20 plus the programs planned by Efficiency Manitoba for the years 2020/21 and 2021/22.

Efficiency Manitoba's DSM program adjustments have:

- Reduced the Load Forecast values for 2019/20 through 2021/22 to account for the savings anticipated from Manitoba Hydro's 2019/20 DSM programs²⁸.
- Reduced the Load Forecast values for 2019/20 through 2021/22 to account for the savings anticipated from Efficiency Manitoba's 2020/21 and 2021/22 programs²⁹.

There are three issues with Efficiency Manitoba's DSM program adjustments. First, Efficiency Manitoba has not made any adjustment for the impact of Manitoba Hydro's 2018/19 DSM Programs³⁰. According to Manitoba Hydro's 2018/19 DSM Plan³¹ the annual anticipated savings from these programs is 355 GWh. This adjustment also needs to be incorporated into the calculation of the target values for 2020/21 - 2022/23.

The second issue is that Efficiency Manitoba claims³² that the adjustments for prior years' DSM programs account for the loss in persistence of savings over time.

However, it is noted that, in terms of the DSM program adjustment values used, there is no decline in subsequent years from the savings attributed to either Manitoba Hydro's

²⁷ Coalition/EM I-2 c)

²⁸ The 350 GWh adjustment set out in Table #1 represents the anticipated savings in 2019/20 from Manitoba Hydro's 2019/20 DSM Plan per PUB/EM I-26 e)

²⁹ The respective adjustments of 373 GWh and 776 GWh represent the forecast Annual Electric Savings from Efficiency Manitoba's 2020/21 programs and 2020/21 plus 2021/22 programs respectively per Section 2, page 3.

³⁰ Coalition/EM I-2 d)-I

³¹ PUB/EM I-26 d), Manitoba Hydro's 2018/19 DSM Plan, page 2

³² Coalition/EM I-2 g)

2019/20 DSM Programs or Efficiency Manitoba's 2020/21 and 2021/22 programs. What is not clear is whether this is due to: a) there being no loss in persistence in the initial years after implementation or b) adjustments for persistence were not included. Further discovery would be required to clarify this issue³³.

Finally, Efficiency Manitoba has confirmed that its DSM program savings values are "annualized values" which means that they are calculated as if all programs were implemented at the start of the year they are introduced³⁴. In reality this is not what occurs as programs are taken up by customers throughout the first year they are introduced such that actual first year's savings are less than the annualized values. However, any attempt to calculate the impact³⁵ would require significant effort. For purposes of calculating the target values to be used in the development of the Plan Efficiency Manitoba's approach is reasonable. For purposes of verifying whether targets are met on an actual basis Efficiency Manitoba as indicated it will be using actual weather normalized load³⁶ and, as result, this issue will not exist.

As Efficiency Manitoba has indicated³⁷ adjustments related to Codes and Standards are also required in order to avoid double counting. The potential for double counting arises from the fact that:

- The 2018 Load Forecast which is used as the starting point includes the impact of Codes and Standards implemented in 2017/18 and earlier years.
- The adjustment for Manitoba Hydro's 2019/20 DSM Programs includes 90 GWh of savings in that year attributable to Codes and Standards³⁸.
- The adjustments for Efficiency Manitoba's 2020/21 and 2021/23 planned DSM programs include savings attributable to both Codes and Standards that were

³³ The interrogatories filed by the Coalition (Coalition/EM I-2 e) & g)) addressed this issue. However, further follow-up, which the timetable and process established by the PUB does not provide for, would be necessary to fully clarify issue.

³⁴ Coalition/MH I-2 f)

³⁵ Apart from making very simplifying assumptions such as the use of a ½ year rule would require significant effort,

³⁶ PUB/EM I-42 a)

³⁷ PUB/EM I-45 a)

³⁸ It is not readily apparent whether this represents the incremental impact of codes introduced prior to 2019/20 and/or also the impact of anticipated Manitoba Building Code amendments in 2020 (per PUB/EM I-39)

enacted in a prior year and which are impacting the consumption of a new load in those years as well as new codes coming into force in those years³⁹.

Efficiency Manitoba has provided an explanation of adjustments made for Codes and Standards⁴⁰ and the values are derived from the forecast impacts included in the 2016/17 Power Smart Plan - 15-year Supplement and calculated as the difference between the forecast impact of Codes and Standards in the reference year and the forecast impact for 2017/18⁴¹. However, it is not clear whether these adjustments appropriately address the potential for double counting. For example, the forecasts in the 2016/17 Power Smart Plan - 15-year Supplement for the years beyond 2017/18 are likely to include additional impacts attributable to new Codes and Standards anticipated to come into effect post 2017/18 on new building and appliances added in those years. These effects were not included in the 2018 Load Forecast and therefore do not need to be “added back”. Again, further discovery would be required to fully resolve these issues.

However, it is noted that for purposes of verifying whether targets are met on an actual basis Efficiency Manitoba will be using actual weather normalized load and the potential for overlap will not exist. What is important, for purposes of developing the target values to be used in future Plans, is that a standard approach be developed and followed.

With respect to the calculation of natural gas target values for 2020/21 through 2022/23, the Act⁴² specifies that net savings are to be equal to at least “0.75% of the consumption of natural gas in the preceding year”. Again, for purposes of the 2020/21-2022/23 Plan this would be the years 2019/20 to 2021/22 respectively. However, in this case, since the forecast sales volumes for natural gas are considered confidential, Efficiency Manitoba’s approach is to use the actual natural gas volume consumption per

³⁹ Coalition/EM I-7 c). It is noted that the relevant Codes and Standards listed in PUB/EM I-39 include a number that were in effect in 2017/18.

⁴⁰ Coalition/EM I-2 d) and PUB/EM I-45 a)

⁴¹ For example, the 160 GWh adjustment for 2019/20 is derived as the difference between the C&S value of 322 GWh reported for 2019/20 and the 161 GWh value reported for 2017/18 (difference likely due to rounding)

⁴² Section 7.1

Manitoba Hydro's 2017/18 Annual Report, the most recently available Annual Report at time the Plan was being prepared is reasonable.

In the case of natural gas, the Act defines consumption as natural gas that *“(i) is metered and sold to a customer in Manitoba, and (ii) is not used as a feedstock or ingredient in the manufacture of a product.”* As a result, Efficiency Manitoba's removal of natural gas consumption used as an input to industrial production and natural gas used to generate electric power⁴³ is appropriate.

The derivation of the natural gas target values for 2020/21 through 2022/23 also includes adjustments for the impact of Manitoba Hydro's 2019/20 DSM programs and Efficiency Manitoba's 2020/21 and 2021/22 planned DSM programs. In this case, the need for such adjustments is open to debate. In the case of the electric targets the starting point was a forecast for the “preceding year” assuming no additional DSM savings beyond that incorporated in the most recent actual consumption values. However, in the case of natural gas the starting point is not a forecast for the preceding year but rather the actual sales in a much earlier year. It would be equally reasonable for Efficiency Manitoba to assume that the 2017/18 actual natural gas volumes are a reasonable proxy for the natural consumption in the preceding year including the impact of any DSM program. Based on this assumption, no adjustments would be required for DSM.

However, if adjustments for DSM are to be included in the derivation of the target values for natural gas, then at least one further adjustment is required. Since the starting point is the actual 2017/18 volumes it would be necessary to include in the adjustments the impact of Manitoba Hydro's (Centra Gas') 2018/19 DSM programs⁴⁴.

It is noted that the inclusion of DSM program adjustments has a minimal effect on the target values for natural gas⁴⁵. As result, for purposes of simplicity it would be reasonable to exclude the DSM adjustments from the calculation for the target values to be used in developing the Plan. Again, it is noted that for purposes of verifying whether

⁴³ The removal of natural gas used to generate electricity aligns with the requirement to removed natural gas used in the manufacture of a product.

⁴⁴ The savings in the 2018/19 DSM Plan, after allowing for interactive effects, are 8.5 million cubic metres per PUB/EM I-26 d)

⁴⁵ Increases them by roughly 1%-2.5%.

targets are met on an actual basis Efficiency Manitoba will be using actual weather normalized volumes and this issue does not exist.

In reviewing the planning targets for electricity savings, while the use of forecast values as the starting point is reasonable, there are distinct differences between the definition consumption as set out in the Act and how it has been determined by Efficiency Manitoba that the PUB should consider. Also, the PUB will need to consider if the DSM adjustments made by Efficiency Manitoba are appropriate.

In reviewing the planning targets for natural gas, while the use of historical use as the starting point is reasonable, the PUB will need to similarly consider whether the DSM adjustments made by Efficiency Manitoba are appropriate or even required.

3.1.2 Attribution to Targets

Section 16 of the Efficiency Manitoba Act requires that:

Efficiency Manitoba must appoint an independent assessor to assess the following and prepare a report on the assessment:

- (a) the results obtained by Efficiency Manitoba under an approved efficiency plan;*
- (b) the cost-effectiveness of obtaining those results;*
- (c) any other matter prescribed by regulation.*

As noted earlier, in terms of measuring the results: “New in-year savings in the first year are determined by the annualized first year savings assuming that the measures were all adopted at the start of the year.”⁴⁶ Efficiency Manitoba has also noted⁴⁷ that “increases in natural gas usage due to interactive effects from electricity DSM programs are treated as a reduction in natural gas saving for purposes of net savings and percent of target achieved”. Finally, with respect to Codes and Standards, the energy savings reported in each year will be the impact of codes and standards due to codes and standards that are in effect in that year. This will include both the incremental impact

⁴⁶ Coalition/EM I-4 d)

⁴⁷ Coalition /EM I-6 a)

EFFICIENCY MANITOBA 2020-2023 EFFICIENCY PLAN
PUB INFORMATION REQUESTS OF CONSUMERS COALITION
DECEMBER 13, 2019

Table: PUB/Coalition 19 a) -1				
Determination of Reference Load Forecast (GWh)				
Plan Year		2020/21	2021/22	2022/23
Previous Year's General				
Consumer Forecast Sales ⁽¹⁾		22,917	23,199	23,420
Less - Unmetered Sales ⁽²⁾		<u>91</u>	<u>91</u>	<u>89</u>
Previous Year's Forecast				
Metered Sales		22,826	23,108	23,331
Less 2018/19 DSM ⁽³⁾				
(@meter)		315.5	315.5	315.5
Less 2019/20 DSM ⁽⁴⁾				
(@ meter)		310.6	310.6	310.6
Less EM Plan				
Cumulative Savings ⁽⁵⁾		0	331.1	674.1
(@ meter)				
Plus 2017/18 Cumulative				
Codes and Standards ⁽⁶⁾		<u>140</u>	<u>196</u>	<u>244</u>
(@ meter)				
Reference Electric Load		22,340	22,347	22,275
Target Savings (@1.5%)		335	335	334
Notes:				
	1) Page 7 of Manitoba Hydro's 2018 Load Forecast (PUB/EMI-45)			
	2) Total of Residential-FRWH, General Service-FRWH and Lighting - same page			
	3) Based on Manitoba Hydro's 2018/19 DSM Plan (355 GWh) adjusted for losses. For purposes of the adjustment it is assumed that savings attributed to Load Displacement Generation, the Industrial Performance Optimization Program and the Commercial Custom Measures Program (totalling 129.5 GWh) are transmission-connected and a loss adjustment of 110% was applied. For the balance of the savings a loss adjustment of 114% was applied.			
	4) Based on Manitoba Hydro's 2019/20 DSM Plan (350 GWh) adjusted for losses. For purposes of the adjustment it is assumed that savings attributed to Load Displacement Generation, the Industrial Performance Optimization Program and the Commercial Custom Measures Program (totalling 111.6 GWh) are transmission-connected and a loss adjustment of 110% was applied. For the balance of the savings a loss adjustment of 114% was applied.			
	5) Based on EM's Plan. 2020/21 adjustment based on 2019/20 Plan results (373 GWh) with savings attributable to Load Displacement Generation and Customer Programs (123.2 GWh) being transmission-connected and the balance distribution-connected. For 2022/23 the adjustment is based on the cumulative impact of the 2019/20 and 2020/21 planned savings (759 GWh per PUB/EMI-39R) with 261.6 GWh being transmission-connected.			
	6) Based on the Codes and Standards savings at the meter per the 2016/17 Power Smart Plan - 15-Year Supplement assuming no further adjustments are required.			

Notes:

1) Page 7 of Manitoba Hydro's 2018 Load Forecast (PUB/EM I-45)

2) Total of Residential-FRWH, General Service-FRWH and Lighting - same page

3) Based on Manitoba Hydro's 2018/19 DSM Plan (355 GWh) adjusted for losses. For purposes of the adjustment it is assumed that savings attributed to

Load Displacement Generation, the Industrial Performance Optimization Program and the Commercial Custom Measures Program (totalling 129.5 GWh) are transmission-connected and a loss adjustment of 110% was applied. For the balance of the savings a loss adjustment of 114% was applied.

4) Based on Manitoba Hydro's 2019/20 DSM Plan (350 GWh) adjusted for losses. For purposes of the adjustment it is assumed that savings attributed to

Load Displacement Generation, the Industrial Performance Optimization Program and the Commercial Custom Measures Program (totalling 111.6 GWh) are transmission-connected and a loss adjustment of 110% was applied. For the balance of the savings a loss adjustment of 114% was applied.

5) Based on EM's Plan. 2020/21 adjustment based on 2019/20 Plan results (373 GWh) with savings attributable to Load Displacement Generation and Customer Programs

(123.2 GWh) being transmission-connected and the balance distribution-connected. For 2022/23 the adjustment is based on the cumulative impact of the 2019/20 and 2020/21 planned savings (759 GWh per PUB/EM I-39R) with 261.6 GWh being transmission-connected.

6) Based on the Codes and Standards savings at the meter per the 2016/17 Power Smart Plan - 15-Year Supplement assuming no further adjustments are required.

Meeting Savings Targets - Harper Consumption Baseline

	<u>Reference</u>	<u>2020/21</u>	<u>2021/22</u>	<u>2022/23</u>	<u>Average</u>
1 Reference Electric Load @meter	1	22,340	22,347	22,275	22,321
2 Target Savings (@1.5% @meter)	1	335	335	334	335
3 EM Plan Savings @Gen	2	373	386	377	379
EM Plan Savings from Transmission Customers	3	123.2	138.4	139	134
4 = Load Displacement, Custom @gen					
Remaining EM Plan Savings from Distribution		249.8	247.6	237.9	245
5 Customers @gen					
6 Transmission Customer Savings @meter	4	113	127	128	123
7 Distribution Customer Savings @meter	5	219	217	209	215
8 EM Plan Total Savings @meter		332	344	336	338
		1.49%	1.54%	1.51%	1.51%

1 - PUB/Harper-19

2 - PUB/EM-39R

3 - Plan p.513

4 - 9% losses for transmission connected loads per 2018 Electric Load Forecast p.8

5 - 14% losses for distribution connected loads

January 2, 2020

Manitoba Energy Forecast

The weather adjusted actual Gross Firm Energy was 25,870 GWh in 2017/18. Gross Firm Energy has grown 198 GWh (0.8%) per year for the past 10 years. This historical growth reflects the effect of past Demand Side Management (DSM) initiatives. Gross Firm Energy is forecast to grow to 32,363 GWh by 2037/38 at an average of 325 GWh (1.1%) per year. This does not reflect future market-based DSM programs.

Distribution Losses, which are the difference between Manitoba Hydro's substations and the customers' meters, have a wide variance from year to year. The differences have ranged between 3.5% and 5.5% of Total Sales. It is forecast to be between 4.8% and 4.9% of Sales for the entire forecast.

Transmission Losses, which are the difference between the generators and the substations, are forecast to be approximately 9.0% of Total Sales throughout the entire forecast period.

Distribution Losses and Transmission Losses, totaling almost 14%, need to be added to Total Sales to estimate Gross Firm Energy. The 14% value should be used to estimate load at generation when only load at the customer's meter is known. For example, to convert Power Smart program savings from the customer meter to generation. The exception is for large General Service customers who own their own transformation and incur minimal Distribution Losses. For these customers, a 10% value should be used.

4

REFERENCE:

2, 26-28 and 34-35 (PDF 205, 229-231 and 237-238)

6-7 (PDF 110-111)

PREAMBLE TO IR (IF ANY):

Section A2 (page 27-28) of the Application states:

“Efficiency Manitoba analyzed the portfolio, program bundles, and customer segments to quantitatively demonstrate the merits of the Plan. Developing a transparent budget while ensuring stakeholders benefit from the Plan required a detailed and systematic quantitative analysis of costs and benefits associated with proposed programs, offers, and initiatives; this is included within this Section. The quantitative analysis completed included program costs, savings per year, and cost-effectiveness tests. For each of these analyses, multiple perspectives were reviewed through evaluation layers including overall portfolio, customer segment, and program bundle. These layers afforded the opportunity to maintain overall portfolio performance while acquiring insights with respect to individual customer segment or bundle contributions. Using this multi-criteria decision framework allowed Efficiency Manitoba to select or reject individual DSM initiatives or make program-specific adjustments in order to develop the proposed electric and natural gas portfolios.”

Section A2 (page 34) states:

“Figure A2.2 illustrates the multi-criteria decision framework that allowed Efficiency Manitoba to make program-specific adjustments and selections required to develop the proposed electric and natural gas portfolios. From the quantitative analysis perspective, program costs, savings, and cost-effectiveness were primarily relied upon at program bundle, customer segment, and overall portfolio evaluation levels.”

Section A2 (page 26) states:

“The Plan considers factors beyond the quantified electric and natural gas savings. The programs, offers, and initiatives included within the Plan will result in numerous non energy benefits that will positively impact Manitobans”.

Section A2 (page 2) states:

“The Plan development process considered the following ... designing a Plan that maximized value for money and benefits for Manitobans and the Manitoba economy”.

Section 4 (pages 6-7) describe the benefits of the proposed portfolio to Manitobans through incentives and private sector services.

QUESTION:

- a) Is the Quantitative Analysis described on pages 27-28 the same as the Multi-Criteria Decision Analysis described on pages 34-35?
 - I. If not, what is the difference and what are the roles of each in developing the proposed portfolios?
- b) It is noted that not all the factors described as being “considered” were quantifiable and therefore amenable to Quantitative Analysis. Similarly, not all of the factors described as being considered are referenced in the description of the Multi-Criteria Decision Analysis. What factors were used in determining the individual programs/measures/technologies and the resulting program bundles that were included in the proposed portfolios and what factors were assessed after the portfolios were established?
- c) Were the non-energy program benefits described on pages 26-27 used in the determination of the proposed portfolios or determined after the fact?
 - I. If used in the determination of the proposed portfolios why aren’t these factors included in the Multi-Criteria Decision Analysis framework illustrated on page 35?
 - II. If used in the determination of the proposed portfolios, please indicate how each non-energy benefit was evaluated (e.g., measured).
- d) Were the benefits to Manitobans (per Section 4, pages 6-7) used in the determination of the proposed portfolios or determined after the fact?
 - I. If used in the determination of the proposed portfolios why aren’t these factors included in the Multi-Criteria Decision Analysis framework illustrated on page 35?

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- e) Were the GHG savings associated with each program/measure/technology and the resulting program bundles used in the determination of the proposed portfolios or determined after the fact?
- f) How was the requirement for customer segment diversity factored into the determination of proposed portfolios?
 - I. What did Efficiency Manitoba consider would be a satisfactory degree of customer segment diversity?
 - II. Were candidate portfolios first established on the basis of other factors and then rebalanced to achieve a satisfactory degree of customer segment diversity? If so, what were the factors used to determine the initial candidate portfolios? If not, what was the approach used?
- g) The illustration of the Multi-Criteria Decision Analysis (Section A2, page 35) suggests that the impact of the efficiency plan on rates and average customer bill amounts was one of the explicit factors in selecting the proposed program bundles and the overall portfolio. Please confirm if this was the case.
 - I. If so, how was the impact on rates and average customer bill amounts explicitly taken into account in the determination of the proposed portfolios (e.g., were maximum allowable limits set for rate and bill impacts?).
 - II. If so, were there specific programs/measure/technologies and associated program bundles that were excluded due to their impact on rates and average customer bill amounts?
- h) How was the objective of – “if it is practical to do so, at least 5% of Efficiency Manitoba's budget for demand-side management initiatives is allocated to initiatives targeting low-income or hard-to-reach customers” factored into the determination of the proposed portfolios?
- i) Overall, please provide a step by step description as to how, starting with the existing programs and the inventory of programs/measures and technologies identified through the innovative stage the proposed portfolios were developed. For each step please describe the options/alternatives that were considered and the specific factors used in their assessment. In describing the steps please indicate where in the process each of the issues noted in parts (d) through (i) were addressed.
- j) Please indicate how the steps outlined in the response to part (j) ensured that all of the programs/measures/technologies identified during the innovation stage as well as those measures/technologies in existing programs were given equal consideration.

RATIONALE FOR QUESTION:

To better understand the portfolio development process and the consideration of multiple decision criteria.

RESPONSE:

- a) The quantitative analysis described in Section A2.3 of the 2020/23 Efficiency Plan (“Plan”) beginning on p. 230 of 591 includes the following subsections:
- I. Section A2.3.1 – Cost Effectiveness Tests (Plan, p. 231 of 591)
 - II. Section A2.3.2 – Rate & Customer Bill Impact Modeling (Plan, p. 234 of 591)
 - III. Section A2.3.3 - Program Diversity Evaluation (Plan, p. 236 of 591)
 - IV. Section A2.3.4 – Multi-Criteria Portfolio Decision (Plan, p. 237 of 591)

The quantitative analysis is therefore different than the multi-criteria portfolio analysis.

- I. The quantitative analysis referred to in the introduction of Section A2.3 speaks more generally to the cost and benefit analyses that were completed and reflected within the cost effectiveness tests as well as the lifecycle rate impact analysis. The multi-criteria portfolio analysis leveraged the results from the quantitative analysis (specifically the savings, costs and PACT results) and further evaluated these results through program bundle, customer segment and overall portfolio lenses.
- b) PUB/EM I-4 provides a description of the changes to the natural gas and electric portfolio program bundles that were driven by the results of the multi-criteria decision analysis considering both quantitative and qualitative perspectives. PUB/EM I-4 also identifies additional changes between the preliminary portfolio and the portfolio included within the Plan resulting from methodology changes and general quality control corrections. Resulting changes are listed by program bundle.

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COALITION/EM I-14a-j****Further information request/clarification:**

COALITION/EM I-14(b), (e) and (f)(ii) requested information regarding the factors that were used in determining the individual programs/measures/technologies and the resulting program bundles that were included in the proposed portfolios, versus the factors that were assessed after the portfolios were established. Efficiency Manitoba's responses are not responsive to the questions posed, as they fail to answer the crux of the issue, which is to establish which factors were used to determine the measures to be included in the Plan and which factors were calculated after the Plan was developed. This response is critical to understanding the methodology employed to select or reject demand-side initiatives and its appropriateness.

Additional response from Efficiency Manitoba (December 5, 2019):

As per the submission pages 230-231 a quantitative analysis was used to create program bundles. This analysis included determination of the technical data as provided for the electric and natural gas portfolios included in Attachment 3 of the Plan (p. 507 to 518 of 591). Specifically, the quantitative analysis determined program bundle annual incremental energy savings resulting from new participation; annual incremental program costs; and the results of the program administrator cost-effectiveness tests (PACT) including the PACT Ratio, PACT net present value and levelized cost. All other factors and non-energy benefits were calculated after the portfolio was developed as per response to COALITION/EM I-14 c, d and e.

A high level step by step description of the process Efficiency Manitoba used to design the proposed portfolio of programs, including the methods used to select or reject measures, has been provided in the revised response to COALITION/EM I-14i.

With respect to COALITION/EM I-14 (e), as per the mandate for efficiency Manitoba and per the response to DAYMARK/EM I-80, Efficiency Manitoba does not have a GHG mandate. GHG savings were assessed after the portfolio was developed.

With respect to COALITION/EM I-14 (f)(ii), Efficiency Manitoba was able to leverage an existing portfolio of energy efficiency programs that was already balanced with respect to customer segment diversity. The enhancements and new program offers were added across all customers segments and therefore there was no requirement for a re-balancing effort.

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- c) Non-energy program benefits were determined after the fact as a factor to be considered during the Public Utilities Board review and were not specifically quantified.
 - I. Not applicable as per response to COALITION/EM I-14c
 - II. Not applicable as per response to COALITION/EM I-14c

- d) The benefits to Manitobans were determined after the fact as a factor to be considered in the Public Utilities Board review.
 - I. Not applicable as per response to COALITION/EM I-14c

- e) As shown, in Figure A2.2 (Plan, Section A2.3.4, p. 238 of 591) the resulting GHG savings associated with the program bundles were determined as the natural gas bundles were established.

- f) As shown in Figure A2.1 (Plan, Section A2, p. 205 of 591), engagement formed part of the portfolio design process. As stated in Section A2.4 (p. 239 of 591), engagement with key stakeholders representing diverse customer segments was completed to ensure the Plan considers the interests of, and provides value to, Manitobans. Section 3.3 (beginning on 89 of 591) describes the methods of engagement undertaken by Efficiency Manitoba including the formation of the Energy Efficiency Advisory Group (p. 94 of 591) and further provides a summary of the key outcomes of the engagement activities associated with the Plan (p. 92 – 94 of 591).
 - I. Beyond what is prescribed in the Efficiency Manitoba Regulation Section 11 (b) and 11(c), Efficiency Manitoba would prefer not to establish a satisfactory degree of customer segment diversity in a quantitative metric. As outlined in Section 3.3 (p. 89 of 591), Efficiency Manitoba views the engagement that was completed for the Plan a good start that will extend beyond the Plan development process and help support continuous improvement at Efficiency Manitoba. To that end, Efficiency Manitoba looks forward to receiving feedback through the Public Utilities Board process and future Energy Efficiency Advisory Group meetings to receive feedback and perspectives on customer segment diversity within current and future Efficiency Manitoba offerings.

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- II. An example of engagement leading to portfolio changes is provided in Section 3.3 (Plan, p. 94 of 591, lines 321-326). As illustrated in PUB/EM I-4, the preliminary portfolio did not contain a Metis Income Qualified Program. Through ongoing engagement with the Manitoba Metis Federation through the Energy Efficiency Advisory Group, Efficiency Manitoba developed Metis targeted offerings included within the Plan.

- g) Although the Lifecycle Rate Impact (LRI) and Customer Bill Impacts were part of the quantitative analysis and intended to be considered within the multi-criteria decision analysis these factors did not ultimately lead to any changes to the proposed program bundles or overall portfolio. As shown in Table 5.6 (Plan, Section 5.4.1, p. 139 of 591) for the electric portfolio and Table 5.7 (Plan, Section 5.4.2, p. 141 of 591) for the natural gas portfolio the rate impacts based on the LRI analysis were found to be minimal. Similarly, customer bill impacts for participating customers shown in Table 5.8 (Plan, Section 5.5.1, p. 142 of 591) for the electric portfolio and Table 5.9 (Plan, Section 5.5.2, p. 144 of 591) for the natural gas portfolio corresponded reasonably to the other cost and benefit factors considered within this analysis.
 - I. Not applicable as per response to COALITION/EM I-14g
 - II. Not applicable as per response to COALITION/EM I-14g

- h) Please see Daymark/EM I-94 for specific factors considered for hard-to-reach customers along with offers developed to best target these customers. COALITION/EM I-14f discusses the engagement activities that were undertaken to consider customer segment diversity including hard-to-reach customers and how those factors influenced the Plan. The Plan satisfies Section 11(c) of the Efficiency Manitoba Regulation as discussed in Section 6.2 (p. 168 – 169 of 591).

- i) PUB/EM I-1 provides details and considerations of the initial high level screenings of measures / technologies that was completed. PUB/EM I-4 provides a description of the changes to the natural gas and electric portfolio program bundles that were driven by the results of the multi-criteria decision analysis considering both quantitative and qualitative perspectives. PUB/EM I-4 also identifies additional changes between the

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preliminary portfolio and the portfolio included within the Plan resulting from methodology changes and general quality control corrections. Resulting changes are listed by program bundle. Producing a step by step description of the high level screening and portfolio development process inclusive of each option/alternative considered and specific factor used while indicate where each of the issue noted in parts (d) through (h) were addressed would require an extensive amount of time to gather and coordinate and as such Efficiency Manitoba has determined there is not adequate time to gather this information.

Further information request/clarification:

COALITION/EM I-14(is) requested a step by step description, starting with the existing programs and the inventory of programs/measures and technologies identified through the innovative stage, of how the proposed portfolios developed, including a description of options and alternatives considered, as well as the specific factors used in their assessment. In response, Efficiency Manitoba referred back to PUB/EM I-1 and I-4 but did not provide a step by step description of the process, stating this would require an extensive amount of time. This response is critical to understanding the options and alternatives considered by Efficiency Manitoba and the subsequent development of both the preliminary portfolios as well as the final proposed portfolios, which is directly relevant to the assessment of the methodology used to select or reject demand-side management initiatives.

Additional response from Efficiency Manitoba (December 5, 2019):

The following provides a generic step-by-step description of how the proposed portfolio was developed. Each individual technology within a customer segment is unique and may have required adaptation or changes to this generic process description. Compiling this information and describing technology specific steps across the entire portfolio could not be completed in a reasonable amount of time and the results from smaller refinements, such as adjusting an incentive level, were not tracked and do not exist.

Efficiency Manitoba developed the portfolio of electric and natural gas energy efficiency offers through completion of (i) a pre-screening process; (ii) development of a

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preliminary portfolio; and (iii) analysis and refinement of the portfolio to develop the final portfolio of electric and natural gas program bundles included within the Plan.

(i) Pre-Screening Process

In addition to the examples provided in PUB/EM I-1, a larger list of measures / technologies identified during the development of the Plan has been provided in COALITION/EM I-10(g). Due to pre-screening factors identified in PUB/EM I-1, the listed measures / technologies failed to move forward to the preliminary portfolio and as such did not warrant any quantitative cost benefit analysis based on this initial high level qualitative screenings as described in COALITION/EM I-10b. These measures will continue to be monitored and reevaluated against the pre-screening criteria for potential inclusion in subsequent Plans.

The pre-screening process also identified initiatives that are currently offered by Manitoba Hydro and are not moving forward to Efficiency Manitoba. These are identified in DAYMARK/EM I-4 and include the Residential Pay-As-You-Save (PAYS) financing program, the Network Energy Manager program, Curtailable Rates and the LED Roadway Lighting Program.

(ii) Preliminary Portfolio Development

Efficiency Manitoba used the energy efficiency measures remaining to develop a preliminary portfolio with the intent of achieving the mandated electric and natural gas energy savings targets. Steps completed in the preliminary design of the portfolio of programs typically include the following components for each energy efficiency technology:

- Background energy efficient technology research including review with engineers / technical specialists; contacting other utilities with similar offers; and reviewing research completed by organizations such as Natural Resources Canada / Office of Energy Efficiency, Energy Star, Resource, or the U.S. Department of Energy.
- Complete product and market channel research including identifying the following as applicable:
 - Energy efficient technology manufacturers / brands;

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- Distributors, dealers, wholesalers, or service companies of the energy efficient technology;
- Design professionals, architects, or consulting engineers responsible for specifying the energy efficient technology; and
- Customer and industry associations.
- Based on background and market channel research identify and/or quantify the following as applicable in order to inform program design parameters:
 - New versus used equipment in the replacement market for the non-energy efficient alternatives;
 - Breakdown between the competing manufacturers in the market;
 - Sales per year, life expectancy and costs for both energy efficient technology and non-energy efficient alternatives;
 - Purchasing process, decision criteria, or barriers for a customer to purchase and install the energy efficient technology;
 - Energy usage / savings of energy efficient technology, interactive effects, persistence, hours of operations and non-energy benefits; and
 - Possible rebate or incentive levels as well as promotional strategy required to encourage transition to the energy efficient technology. Note this last step is often the most iterated given it can be a large component of program costs and therefore have the greatest impact on cost-effectiveness.

PUB/EM I-4 provides the program bundle energy savings, costs and program administrator cost test results associated with the preliminary portfolio. During this stage, Efficiency Manitoba removed Solar Pool Heaters & Solar Hot Water from program consideration. Projected participation in these respective programs was less than ten customers per year due to factors such as the improved efficiency and declining price of solar PV panels reducing the solar domestic water heating market and the market trend of electric pool water heating through air source heat pumps which significantly increases the efficiency of pool heating compared to the previous electric heating options and limit the energy savings opportunity through a solar pool water heater. Please see PUB/EM I-1a for program administrator cost test (PACT) metrics for these specific measures. As these are the only rejected measures from the preliminary

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portfolio, these are the only rejected technologies that have specific program administrator cost test results available.

(iii) Analysis and Refinement of the Portfolio

There were a number of changes to the natural gas and electric portfolio program bundles that were driven by the results of the multi-criteria decision analysis considering both quantitative and qualitative perspectives. Additional changes between the preliminary portfolio and the portfolio included within the Plan are the result of methodology changes and general quality control corrections. Resulting changes by program bundle are summarized in PUB/EM I-4.

With respect to new technologies and measures included within the electric or natural gas portfolio, there are several information request responses which provide measure level details as follows:

- PUB/EM I-33b identifies all the measures and technologies included within the electric and/or natural gas portfolio by customer segment and program bundle. Status as a new or continuing offer or measure within Manitoba is also provided within the response.
- The Attachment to COALITION/EM I-91 provides measure level resolution with respect to the electric energy savings, electric incentive, natural gas energy savings and natural gas incentive for every measure included within the Portfolio.
- The Attachment to DAYMARK/EM I-13 provides measure level information on free ridership and free driver modeling inputs used to determine measure level energy savings.

j) Please see response to COALITION/EM I-14i.

Indeed, unless options with different levels of incentives are considered the plan development process does not align with IRP principles as it does not consider all feasible options.

3.4 PREFERRED PORTFOLIO SELECTION (Added December 13, 2019)

This section of the Evidence examines the portfolio development process followed by Efficiency Manitoba and considers the extent to which it follows the principles of integrated resource planning.

Efficiency Manitoba developed its proposed natural gas and electric portfolios using a three-stage process⁷²:

- **Pre-Screening Process:** Identified measures/technologies that could potentially be included in either the natural gas or electric portfolio and then undertook a high level screening process to identify those that were not suitable for inclusion based on the criteria outlined in Section 3.2. As noted previously, the measures/technologies excluded at this stage are set out in the response to Coalition/EM I-10 g).
- **Preliminary Portfolio Design:** Programs were then designed around the remaining measures to create preliminary portfolios for natural gas and electricity⁷³.
- **Final Portfolio Design:** During this stage the multi-criteria decision analysis was undertaken at both the program bundle and portfolio level (using the evaluation criteria discussed in Section 3.2) and the portfolios were refined with a view to aligning the anticipated savings with the targets, reducing the budget costs and improving the cost-effectiveness of the portfolios. Changes were also made as a result of general quality control corrections. The response to PUB/EM I-4 sets out the specific refinements made to each program bundle. During this stage, two additional measures (Solar Pool Heaters & Solar Hot Water) were removed from program consideration based on their anticipated low participation rates and cost effectiveness results⁷⁴. In addition, a Metis Income Qualified program bundle was

⁷² Coalition/EM I-14 i)

⁷³ PUB/EM I-4 summarizes the savings, costs and PACT results for the program bundles included in the preliminary portfolio.

⁷⁴ PUB/EM I-4 and Coalition/EM I-17 a)

added to both the electric and natural gas portfolios based on input from stakeholders.

Comments

As discussed in Section 3.3, the process and criteria used by Efficiency Manitoba to identify and pre-screen potential measures/technologies are reasonable.

It is understood that all measures/technologies remaining after the pre-screening process were included in the preliminary portfolio⁷⁵. To do so Efficiency Manitoba designed programs that included the remaining measures in order to determine the costs (including incentives), participation rates and resulting savings⁷⁶. The resulting preliminary portfolios are set out in PUB/EM I-4.

The incentive levels assumed in the individual program designs will have a direct impact on program costs. They will also have an impact on program participation rates and the resulting energy savings. Efficiency Manitoba's responses to information requests outline its approach to establishing incentives and participation rates⁷⁷, acknowledge their interrelationship and note that different levels of incentives are considered during program design. The responses also indicate that "Efficiency Manitoba approached program design by identifying new measures that could contribute savings and considering how to get more savings from measures already part of Manitoba Hydro's DSM portfolio"⁷⁸. This would suggest that "maximizing energy savings" was the design criteria used. However, other responses indicate that the participation rates used were frequently based on historical experience⁷⁹. Overall, there is a lack of clarity regarding the objectives underpinning the development of the preliminary portfolio. Since the preliminary portfolio is effectively the "foundation" upon which the final portfolio was developed (through a series of refinements) it is important to clearly understand the principles used to establish it.

⁷⁵ Coalition/EM I-14 i) and Daymark/EM I-53

⁷⁶ Coalition/EM I-14 i)

⁷⁷ Daymark/EM I-13 d) and Daymark/EM I-77

⁷⁸ Coalition/EM I-13 a)

⁷⁹ Daymark/EM I-13 d-e), Attachment 1

REFERENCE:

Efficiency Plan p.237, 238, 250 of 591

PREAMBLE TO IR (IF ANY):**QUESTION:**

- a. Identify programs and initiatives that Efficiency Manitoba considered but rejected and explain why the measures were rejected. Provide the initial high level screen as well as the list of measures that received additional scrutiny. Provide cost effectiveness assessments or program administrator cost test (PACT) results for the rejected measures.
- b. Explain why Efficiency Manitoba is not proposing conservation (or inverted block) rates at this time.
- c. Provide the levelized utility costs of conservation rates identified by Manitoba Hydro in its Power Smart and DSM plans and compare these to the Efficiency Manitoba portfolio levelized costs.
- d. Explain why Efficiency Manitoba did not propose any gas-to-electricity fuel switching programs?

RATIONALE FOR QUESTION:**RESPONSE:**

- a. Programs/measures that Efficiency Manitoba considered but did not put forth in the Plan include: small scale wind, dynamic glazing, real-time energy management, energy storage, residential behavioural, personal comfort systems, advanced rooftop units, solar air pre-heating, HVAC maintenance, and variable refrigerant flow systems. The initiatives that were not included after high level screens were rejected for a combination of the following reasons:
 - the technology was not yet approved for use in Canada;
 - the technology would not meet municipal permitting requirements;

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- the potential market for the technology is too small to warrant a dedicated program rather than simply applying for a custom incentive;
- the measure would result in high free ridership;
- the program/technology's energy savings claims are not yet proven or are negligible;
- the program requires a long lead time for implementation;
- based on the current rate structure, the technology provides little to no benefit;
- although the technology is technically available, no local supplier is willing to stock the product;
- the technology saves energy in warm or mild climates but is not meant for use in Manitoba's climate;
- the technology would not effectively operate in Manitoba's climate; and
- the technology is in its early stages and would need more refining before Efficiency Manitoba would recommend it.

Supporting documents and workpapers used in the development of the preliminary portfolio for each technology would require an extensive amount of time to gather and coordinate as it is not kept in a centralized repository nor is it available in a consistent format (i.e. background documentation is different for each technology). Efficiency Manitoba has determined there is not adequate time to gather this information; however, two examples of this type of documentation are provided as attachments. By providing these examples, one can gain a sense of the analysis done, both quantitatively and qualitatively, and how decisions surrounding which measures were included in the Plan were finalized.

Attachments:

- Supporting documents of the high-level screening completed for the residential windows and doors incentive which was included in the Plan (PUB/EM I-1 - Attachment 1); and
- Analysis undertaken for Behavioural Programming not included in the Plan (PUB/EM I-1 – Attachment 2).

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Other than the technologies that were approved for submission in the proposed plan, staff completed cost benefit analysis for Solar Domestic Water Heaters and Solar Thermal Pool Heaters. These were removed after results of the multi-criteria decision analysis considering both quantitative and qualitative perspectives (see PUB/EM I-4). The following are the metrics from the cost benefit analysis.

Measure	Electric PACT	Natural Gas PACT	Electric Levelized Utility Cost	Natural Gas Levelized Utility Cost
Solar Domestic Water Heaters				
Solar Thermal Pool Heaters				

1 a & c

- b. The Efficiency Manitoba Regulation 8 (1) d) outlines that net savings from a rate can be counted towards the targets as long as these savings are reasonably attributable to a rate to which Efficiency Manitoba has made a material contribution. The development of a conservation or inverted block rate initiative would be led by Manitoba Hydro and supported by Efficiency Manitoba. A rate initiative was not included in the 2020-2023 DSM Plan, but one may be explored with Manitoba Hydro in future plans.
- c. Conservation Rates were included as a placeholder in Manitoba Hydro’s 2015/16 and 2016/17 Power Smart Plan – 15 Year Supplement Reports. These included high level estimates of the costs, energy savings and timing of a rates initiative that would have required more detailed analysis. The levelized utility cost of this conceptual Conservation Rates initiative in both plans was estimated to be 0.4 cents/kW.h. The Efficiency Manitoba 2020/2023 Plan’s electric portfolio levelized cost is 2.24 cents/kW.h.
- d. Gas to Electricity fuel switching is proposed in the plan. Ground source heat pumps (GSHP) are included within the Residential Home Renovation and Commercial, Industrial, Agricultural (CIA) HVAC and Controls bundles as eligible technologies available to residential, commercial, industrial, and agricultural customers regardless of

the existing heating system being replaced (Plan p.222 of 591). A customer with natural gas could receive an incentive to install a GSHP.

- the potential market for the technology was too small to warrant a dedicated program rather than simply applying for a custom incentive;
- the measure would result in high free ridership;
- the program/technology's energy savings claims were not yet proven or are negligible;
- the program required a long lead time for implementation;
- based on the current rate structure, the technology provided little to no benefit;
- although the technology was technically available, no local supplier was willing to stock the product;
- the technology saved energy in warm or mild climates but was not meant for use in Manitoba's climate;
- the technology would not effectively operate in Manitoba's climate; and
- the technology was in its early stages and would need more refining before Efficiency Manitoba would recommend it.

For the balance of the plan development process, the key evaluation criteria used to determine the DSM initiatives (i.e., the specific measures/technologies) to include in the portfolios are the level of energy savings, the program costs, and program cost effectiveness (as per the PACT). To clarify this point, Coalition/EM I-14 b) specifically asked – “What factors were used in determining the individual programs/measures/technologies and the resulting program bundles that were included in the proposed portfolios and what factors were assessed after the portfolios were established?” Efficiency Manitoba's response was:

“Specifically, the quantitative analysis determined program bundle annual incremental energy savings resulting from new participation; annual incremental program costs; and the results of the program administrator cost-effectiveness tests (PACT) including the PACT Ratio, PACT net present value and levelized cost. All other factors and non-energy benefits were calculated after the portfolio was developed”.

REFERENCE:

Efficiency Plan p.250, 253-256 of 591

PREAMBLE TO IR (IF ANY):**QUESTION:**

For each program bundle, provide a table comparing the budgeted costs and savings (i) as per the Plan versus (ii) as per the preliminary plan prior to adjustments based on the Multi-Criteria Decision Analysis. Provide details of the specific programs that were increased and decreased with the reasons for the changes.

RATIONALE FOR QUESTION:**RESPONSE:**

As documented in PUB/EM I-1a high-level screen of programs was considered, and a number of measures were rejected prior to the development of a preliminary portfolio. Efficiency Manitoba used the resulting programs to develop a preliminary portfolio with the intent of achieving the mandated electric and natural gas energy savings targets. The following tables provide a program bundle comparison of the electric and natural gas energy savings, budgets and program administrator cost test ("PACT") results for both the preliminary portfolios and the portfolios included within the 2020/23 Efficiency Plan ("Plan").

There were a number of changes to the natural gas and electric portfolio program bundles that were driven by the results of the multi-criteria decision analysis considering both quantitative and qualitative perspectives. Additional changes between the preliminary portfolio and the portfolio included within the Plan are the result of methodology changes and general quality control corrections. Resulting changes by program bundle are summarized as follows:

RESIDENTIAL PROGRAMS

Direct Install

- Revised energy savings and interactive effects from residential lighting based on quality control improvement. Change reduced electric energy savings and decreased electric interactive effects for natural gas energy savings.
- Revised budget downward based on quantitative analysis results for other portfolio offers.

Product Rebates

- Revised energy savings and interactive effects from residential lighting based on quality control improvement. Change reduced electric energy savings and decreased electric interactive effects for natural gas energy savings.

Home Renovation

- Removed Solar Pool Heaters & Solar Hot Water from program. Projected participation in these respective programs was less than ten customers per year due to factors such as the improved efficiency and declining price of solar PV panels reducing the solar domestic water heating market and the market trend of electric pool water heating through air source heat pumps which significantly increases the efficiency of pool heating compared to the previous electric heating options and limit the energy savings opportunity through a solar pool water heater. Please see PUB/EM I-1a for program administrator cost test (PACT) metrics for these specific measures.
- Reduced windows incentive based on results of quantitative analysis to improve the cost effectiveness of the Home Renovation program bundle.
- Updated geothermal program to include fuel-switching from natural gas to geothermal.
- Revised budget downward based on quantitative analysis results for other portfolio offers.

New Homes & Major Renovation

- Energy savings and budget changes based on quality control review.

Home Energy Efficiency Kits & Education

- Revised energy savings and interactive effects from residential lighting based on quality control improvement. Change reduced electric energy savings and decreased electric interactive effects for natural gas energy savings.

INCOME QUALIFIED PROGRAMS

Income Qualified Offers

- Furnace Replacement Program costs were missed in the program cost tables within the preliminary natural gas portfolio (the PACT however, did capture these program costs).

INDIGENOUS PROGRAMS

Insulation and Direct Install

- No change between preliminary and Plan portfolios.

Small Business

- Changes reflect increased participation to Metis communities through targeted efforts and collaboration with Manitoba Metis Federation.
- Included budget for indigenous small business natural gas programming.

Community Geothermal

- No change between preliminary and Plan portfolios.

Metis Income Qualified

- A Metis Income Qualified program bundle was not contemplated within the preliminary portfolio. This change increased electric and natural gas energy savings and overall electric and natural gas portfolio budgets.

COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS

Small Business & Appliances

- Revised refrigeration system participation, energy savings and budget.

In-Suite Efficiency

- Revised energy savings and interactive effects from residential lighting based on quality control improvement. Change reduced electric energy savings and decreased electric interactive effects for natural gas energy savings.

Renovation

- Lighting program electric energy savings were reduced through revised participation assumptions in each of the Plan years. The intent of this was to reduce overall electric energy savings to better align with the electric energy savings target, reduce electric portfolio costs and reduce the interactive impact on natural gas energy savings.

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- Updated geothermal program to include fuel-switching from natural gas to geothermal.

HVAC & Controls

- Minor energy savings changes based on quality control review.

New Construction & High-Performance Buildings

- No change between preliminary and Plan portfolios.

Custom

- Revisions to the economic development / large industrial projects to reduce targeted natural gas energy targets associated with these activities.

Load Displacement

- No change between preliminary and Plan portfolios.

EMERGING TECHNOLOGY PROGRAMS

Emerging Technology

- Preliminary plan was missing budget required to reflect residential & commercial solar PV program design costs prior to the 2022/23 program launch.

Differences within the PACT results shown in the tables below are due to a methodology change in addition to the program energy savings and budget revisions identified above. The preliminary portfolio was based on an initial approach that included incremental annual estimated program activity for each program bundle for a 15-year time horizon with consideration of persistent savings in order to complete the 30-year PACT analysis. This methodology was revised as detailed within the Plan such that only 3-years of incremental annual estimated program activity for each program bundle was included along with consideration of persistent savings for the 30-year PACT analysis.

Annual Electric Energy Savings (GW.h) Comparison									
				2020/21	2021/22	2022/23			
				Initial Portfolio Developed			2020/23 Efficiency Plan		
RESIDENTIAL PROGRAMS									
	Direct Install			1.3	2.1	2.9	1.2	1.9	2.6
	Product Rebates			15.5	16.3	15.0	14.3	11.7	8.7
	Home Renovation			3.0	6.4	6.3	3.0	6.2	6.1
	New Homes & Major Renovation			3.5	3.6	3.6	3.3	3.6	3.7
	Home Energy Efficiency Kits & Education			0.6	1.0	1.0	0.6	1.0	1.0
		Subtotal		23.9	29.3	28.8	22.4	24.5	21.9
INCOME QUALIFIED PROGRAMS									
	Income Qualified Offers			2.5	2.7	2.7	2.5	2.7	2.7
		Subtotal		2.5	2.7	2.7	2.5	2.7	2.7
INDIGENOUS PROGRAMS									
	Insulation and Direct Install			0.2	0.3	0.3	0.2	0.3	0.3
	Small Business			0.2	0.2	0.2	0.4	0.4	0.4
	Community Geothermal			0.8	1.2	1.2	0.8	1.2	1.2
	Metis Income Qualified			-	-	-	0.2	0.2	0.2
		Subtotal		1.1	1.7	1.8	1.5	2.1	2.2
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS									
	Small Business & Appliances			12.3	13.3	14.2	14.8	15.2	15.6
	In-Suite Efficiency			0.8	1.4	2.2	0.7	1.0	1.3
	Renovation			120.2	121.5	121.9	110.7	103.1	95.5
	HVAC & Controls			3.4	3.5	3.6	3.3	3.5	3.5
	New Construction & High-Performance Buildings			6.0	8.8	7.2	6.0	8.8	7.2
	Custom			24.2	17.9	28.6	24.2	17.9	28.6
	Load Displacement			99.0	120.5	110.5	99.0	120.5	110.5
		Subtotal		265.8	287.0	288.0	258.7	269.9	262.2
EMERGING TECHNOLOGY PROGRAMS									
	Emerging Technology			-	1.0	5.9	-	1.0	5.9
		Subtotal		-	1.0	5.9	-	1.0	5.9
Program Impact Totals				293	322	327	285	300	295
Codes, Standards & Regulations				88	103	108	88	103	108
Total Energy Savings (GW.h) at Generation				381	425	436	373	403	403

Note: May not add up due to rounding.

Annual Electric Costs (000's \$)

		2020/21	2021/22	2022/23	2020/21	2021/22	2022/23
		Initial Portfolio Developed			2020/23 Efficiency Plan		
RESIDENTIAL PROGRAMS							
	Direct Install	\$663	\$891	\$1,124	\$406	\$578	\$753
	Product Rebates	\$4,033	\$3,638	\$3,120	\$4,033	\$3,638	\$3,120
	Home Renovation	\$2,105	\$3,777	\$3,898	\$1,971	\$3,107	\$3,169
	New Homes & Major Renovation	\$1,103	\$1,117	\$1,148	\$913	\$1,149	\$1,168
	Home Energy Efficiency Kits & Education	\$158	\$230	\$234	\$158	\$230	\$234
	Subtotal	\$8,062	\$9,652	\$9,525	\$7,482	\$8,701	\$8,445
INCOME QUALIFIED PROGRAMS							
	Income Qualified Offers	\$1,169	\$1,639	\$1,618	\$1,188	\$1,660	\$1,637
	Subtotal	\$1,169	\$1,639	\$1,618	\$1,188	\$1,660	\$1,637
INDIGENOUS PROGRAMS							
	Insulation and Direct Install	\$196	\$256	\$272	\$196	\$256	\$272
	Small Business	\$172	\$176	\$216	\$313	\$370	\$472
	Community Geothermal	\$323	\$505	\$515	\$323	\$505	\$515
	Metis Income Qualified	\$0	\$0	\$0	\$97	\$141	\$140
	Subtotal	\$692	\$937	\$1,003	\$929	\$1,272	\$1,398
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS							
	Small Business & Appliances	\$2,727	\$2,786	\$2,848	\$2,636	\$2,698	\$2,763
	In-Suite Efficiency	\$204	\$253	\$303	\$204	\$253	\$303
	Renovation	\$19,146	\$19,732	\$20,168	\$17,425	\$16,710	\$15,961
	HVAC & Controls	\$1,006	\$1,083	\$1,142	\$1,006	\$1,083	\$1,142
	New Construction & High-Performance Buildings	\$1,516	\$1,771	\$1,667	\$1,516	\$1,875	\$1,667
	Custom	\$3,071	\$2,642	\$3,723	\$3,021	\$2,668	\$3,749
	Load Displacement	\$984	\$5,693	\$3,357	\$984	\$5,693	\$3,357
	Subtotal	\$28,655	\$33,961	\$33,207	\$26,793	\$30,980	\$28,942
EMERGING TECHNOLOGY PROGRAMS							
	Emerging Technology	\$124	\$276	\$1,472	\$124	\$317	\$1,463
	Subtotal	\$124	\$276	\$1,472	\$124	\$317	\$1,463
Program Totals		\$38,702	\$46,465	\$46,824	\$36,515	\$42,930	\$41,885
Enabling Strategies & Corporate Overhead		\$8,278	\$8,054	\$9,005	\$8,030	\$8,221	\$9,098
Total Electric Costs (000's \$)		\$46,980	\$54,519	\$55,829	\$44,545	\$51,151	\$50,983
<i>Note: May not add up due to rounding.</i>							

Electric Program Cost-Effectiveness Metrics			PACT			PACT		
			Ratio	NPV (000's \$)	Levelized Cost (cents/kWh)	Ratio	NPV (000's \$)	Levelized Cost (cents/kWh)
			Initial Portfolio Developed			2020/23 Efficiency Plan		
RESIDENTIAL PROGRAMS								
	Direct Install		1.00	\$11	6.21	1.53	\$861	4.15
	Product Rebates		1.64	\$7,288	3.67	1.74	\$7,533	3.49
	Home Renovation		2.37	\$48,457	4.80	2.90	\$14,705	3.67
	New Homes & Major Renovation		5.07	\$18,554	2.40	6.56	\$16,885	1.84
	Home Energy Efficiency Kits & Education		1.41	\$8,935	4.40	1.61	\$353	3.05
	Subtotal		2.01	\$83,245	4.38	2.74	\$40,338	3.19
INCOME QUALIFIED PROGRAMS								
	Income Qualified Offers		2.61	\$22,660	4.30	2.80	\$7,576	3.70
	Subtotal		2.61	\$22,660	4.30	2.80	\$7,576	3.70
INDIGENOUS PROGRAMS								
	Insulation and Direct Install		2.09	\$3,247	5.53	1.90	\$613	5.88
	Small Business		1.27	\$7,179	6.02	1.31	\$1,803	5.31
	Community Geothermal		4.21	\$9,254	2.84	4.03	\$3,816	2.86
	Metis Income Qualified		-	-	-	2.58	\$559	4.23
	Subtotal		1.61	\$19,680	5.43	1.84	\$6,792	4.67
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS								
	Small Business & Appliances		4.84	\$30,622	1.18	3.61	\$7,680	1.43
	In-Suite Efficiency		2.54	\$1,746	3.05	2.48	\$1,055	3.14
	Renovation		5.48	\$1,011,697	1.68	4.97	\$187,957	1.67
	HVAC & Controls		3.52	\$38,850	2.43	2.81	\$5,501	2.30
	New Construction & High-Performance Buildings		2.69	\$25,541	2.75	2.95	\$9,311	2.36
	Custom		5.34	\$155,887	1.23	5.18	\$37,133	1.17
	Load Displacement		3.40	\$59,410	1.64	3.72	\$61,521	1.50
	Subtotal		5.06	\$1,323,755	1.65	4.43	\$310,159	1.59
EMERGING TECHNOLOGY PROGRAMS								
	Emerging Technology		2.94	\$7,845	1.69	2.96	\$4,156	2.11
	Subtotal		2.94	\$7,845	1.69	2.96	\$4,156	2.11
Program Impact Totals			4.18	\$1,457,184	2.01	3.88	\$369,021	1.89
Program Support, Enabling Strategies & Corporate Overhead				(\$54,727)			(\$23,883)	
Overall Portfolio Metrics			3.73	\$1,402,457	2.25	3.27	\$345,138	2.24

Note: May not add up due to rounding.

Annual Natural Gas Energy Savings (million m ³)								
			2020/21	2021/22	2022/23			
			Initial Portfolio Developed			2020/23 Efficiency Plan		
RESIDENTIAL PROGRAMS								
	Direct Install		0.10	0.16	0.21	0.10	0.17	0.23
	Product Rebates		0.55	0.47	0.19	0.55	0.47	0.19
	Home Renovation		0.34	1.17	1.27	0.33	1.15	1.25
	New Homes & Major Renovation		0.14	0.15	0.16	0.07	0.16	0.17
	Home Energy Efficiency Kits & Education		0.03	0.05	0.05	0.03	0.06	0.06
	Subtotal		1.16	2.00	1.88	1.08	2.01	1.90
INCOME QUALIFIED PROGRAMS								
	Income Qualified Offers		1.08	1.07	1.09	1.08	1.07	1.09
	Subtotal		1.08	1.07	1.09	1.08	1.07	1.09
INDIGENOUS PROGRAMS								
	Metis Income Qualified		-	-	-	0.05	0.05	0.05
	Subtotal		-	-	-	0.05	0.05	0.05
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS								
	Small Business & Appliances		0.32	0.32	0.32	0.32	0.32	0.32
	In-Suite Efficiency		0.06	0.08	0.09	0.08	0.12	0.15
	Renovation		1.00	1.13	1.25	1.00	1.13	1.25
	HVAC & Controls		0.78	0.74	0.70	0.79	0.76	0.72
	New Construction & High-Performance Buildings		0.61	0.96	0.71	0.61	0.96	0.71
	Custom		5.29	3.93	7.13	5.29	3.93	4.13
	Subtotal		8.06	7.16	10.20	8.10	7.22	7.29
EMERGING TECHNOLOGY PROGRAMS								
	Emerging Technology		-	0.17	0.17	-	0.17	0.17
	Subtotal		-	0.17	0.17	-	0.17	0.17
	Interactive Effects		(3.16)	(3.20)	(3.16)	(2.12)	(1.85)	(1.62)
	Program Impact Totals		7.14	7.20	10.19	8.19	8.66	8.87
	Codes, Standards & Regulations		3.51	3.28	3.13	3.51	4.09	4.36
	Total Annual Energy Savings (million m³)		10.65	10.48	13.32	11.70	12.75	13.23

Note: May not add up due to rounding.

Annual Natural Gas Costs (000's \$)								
			2020/21	2021/22	2022/23			
			Initial Portfolio Developed			2020/23 Efficiency Plan		
RESIDENTIAL PROGRAMS								
	Direct Install		\$456	\$577	\$697	\$199	\$264	\$327
	Product Rebates		\$890	\$813	\$272	\$890	\$813	\$272
	Home Renovation		\$1,018	\$4,665	\$5,899	\$933	\$3,066	\$3,839
	New Homes & Major Renovation		\$675	\$690	\$719	\$371	\$742	\$769
	Home Energy Efficiency Kits & Education		\$135	\$149	\$152	\$135	\$149	\$152
		Subtotal	\$3,174	\$6,894	\$7,740	\$2,528	\$5,033	\$5,360
INCOME QUALIFIED PROGRAMS								
	Income Qualified Offers		\$3,737	\$3,996	\$3,916	\$5,934	\$5,992	\$6,606
		Subtotal	\$3,737	\$3,996	\$3,916	\$5,934	\$5,992	\$6,606
INDIGENOUS PROGRAMS								
	Metis Income Qualified		\$0	\$0	\$0	\$292	\$330	\$362
		Subtotal	\$0	\$0	\$0	\$292	\$330	\$362
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS								
	Small Business & Appliances		\$249	\$254	\$260	\$249	\$254	\$260
	In-Suite Efficiency		\$38	\$58	\$79	\$38	\$58	\$79
	Renovation		\$2,102	\$2,151	\$2,387	\$2,102	\$2,151	\$2,387
	HVAC & Controls		\$799	\$843	\$888	\$797	\$841	\$886
	New Construction & High-Performance Buildings		\$2,079	\$2,514	\$2,301	\$2,079	\$2,570	\$2,301
	Custom		\$1,933	\$1,160	\$1,820	\$1,959	\$1,262	\$1,702
		Subtotal	\$7,201	\$6,980	\$7,735	\$7,224	\$7,136	\$7,615
EMERGING TECHNOLOGY PROGRAMS								
	Emerging Technology		\$63	\$139	\$168	\$63	\$139	\$168
		Subtotal	\$63	\$139	\$168	\$63	\$139	\$168
Program Totals			\$14,175	\$18,009	\$19,559	\$16,041	\$18,631	\$20,110
Enabling Strategies and Corporate Overhead			\$2,683	\$2,588	\$2,905	\$2,600	\$2,644	\$2,936
Total Natural Gas Costs (000's \$)			\$16,858	\$20,597	\$22,465	\$18,641	\$21,275	\$23,047
<i>Note: May not add up due to rounding.</i>								

Natural Gas Program Cost-Effectiveness Metrics								
			PACT			PACT		
			Ratio	NPV (000's \$)	Levelized Cost (cents/m ³)	Ratio	NPV (000's \$)	Levelized Cost (cents/m ³)
			Initial Portfolio Developed			2020/23 Efficiency Plan		
RESIDENTIAL PROGRAMS								
	Direct Install		0.41	(\$3,361)	47.11	0.78	(\$166)	23.19
	Product Rebates		0.78	(\$447)	23.10	0.79	(\$402)	22.68
	Home Renovation		0.67	(\$22,611)	31.78	1.20	\$1,482	16.82
	New Homes & Major Renovation		0.78	(\$868)	26.67	0.72	(\$492)	28.07
	Home Energy Efficiency Kits & Education		0.40	(\$5,598)	49.44	0.41	(\$243)	43.90
		Subtotal	0.63	(\$32,884)	33.14	1.01	\$179	19.49
INCOME QUALIFIED PROGRAMS								
	Income Qualified Offers		0.48	(\$28,990)	43.68	0.49	(\$8,888)	40.29
		Subtotal	0.48	(\$28,990)	43.68	0.49	(\$8,888)	40.29
INDIGENOUS PROGRAMS								
	Metis Income Qualified		-	\$0	-	0.44	(\$519)	44.94
		Subtotal	-	\$0	-	0.44	(\$519)	44.94
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS								
	Small Business & Appliances		3.38	\$7,013	5.70	1.75	\$541	10.06
	In-Suite Efficiency		3.01	\$660	6.12	3.15	\$351	5.68
	Renovation		1.68	\$20,272	11.99	1.60	\$3,774	11.85
	HVAC & Controls		2.12	\$8,322	9.33	2.59	\$3,773	7.35
	New Construction & High-Performance Buildings		0.52	(\$10,646)	36.93	0.59	(\$2,693)	30.62
	Custom		9.23	\$152,749	2.09	6.51	\$25,684	2.72
		Subtotal	3.19	\$178,370	6.10	2.52	\$31,429	7.19
EMERGING TECHNOLOGY PROGRAMS								
	Emerging Technology		0.89	(\$104)	21.40	0.89	(\$104)	21.40
		Subtotal	0.89	(\$104)	21.40	0.89	(\$104)	21.40
Program Impact Totals			1.51	\$116,392	13.10	1.42	\$22,097	13.03
Program Support, Enabling Strategies & Corporate Overhead				(\$17,509)			(\$7,707)	
Interactive Effects				(\$96,172)			(\$15,146)	
Overall Portfolio Metrics			1.01	\$2,711	19.42	0.99	(\$756)	18.69
<i>Note: May not add up due to rounding.</i>								

REFERENCE:

Daymark Evidence p.79 to 82 ; Manitoba Hydro 2016/17 DSM Plan 15-Year Supplement p.6 of 128 (PUB/EM-26(b))

PREAMBLE:

Manitoba Hydro previously prepared a graph showing the levelized resource costs and levelized utility costs for each DSM measure.

Manitoba Hydro's graph showing levelized utility costs for Manitoba Hydro's DSM programs shows the Furnace Replacement Program with a levelized cost of 140 cents/m³, including approximately 85 cents/m³ related to the utility contribution over resource cost

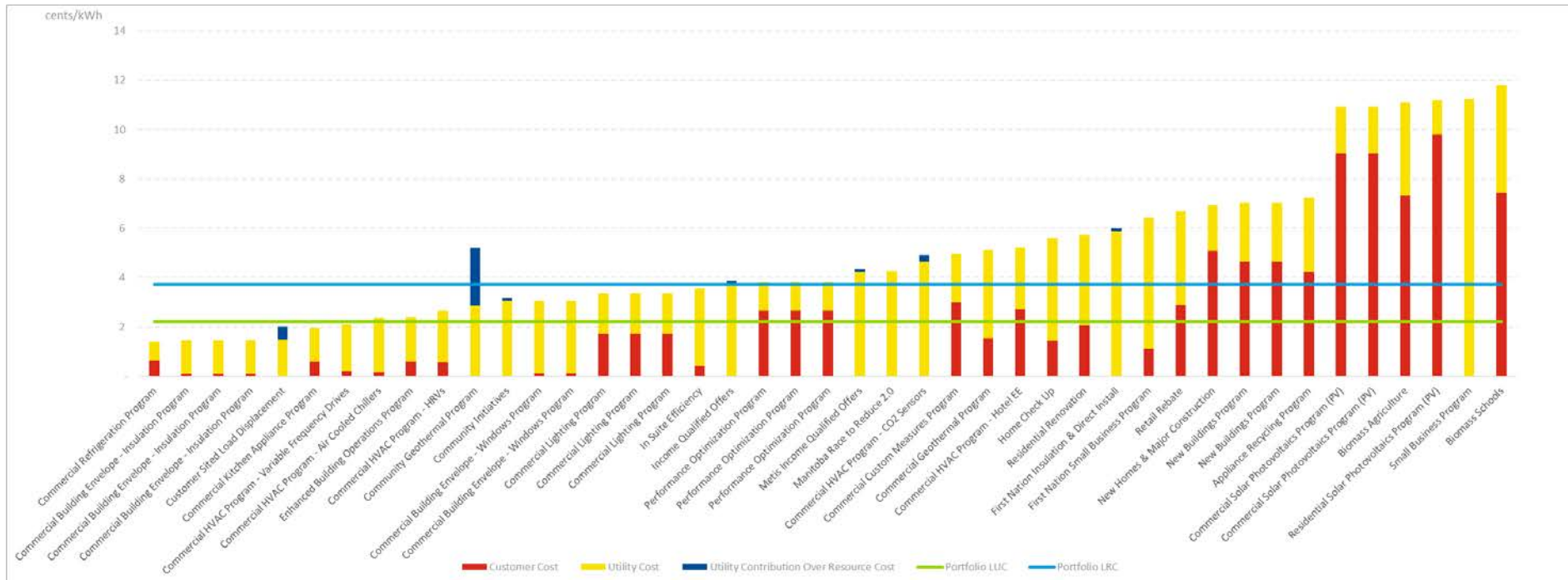
REQUEST:

- a) Graph the levelized resource costs and levelized program administrator costs for each measure in a similar form to the chart on Manitoba Hydro 2016/17 DSM Plan page iv (page 6 of 128 in PUB/EM-26(b)). Prepare separate graphs for electric and gas measures.
- b) Confirm whether the PACT used by EM and reported by Daymark in PUB/Daymark-8 includes the program administrator's contribution over resource cost for Income Qualified standard furnace replacements. Confirm whether the mid-efficiency furnace replacements are treated the same.
- c) If not confirmed, provide the PACT ratio, PACT NPV, and PACT levelized cost including the program administrator's contribution over the resource cost.

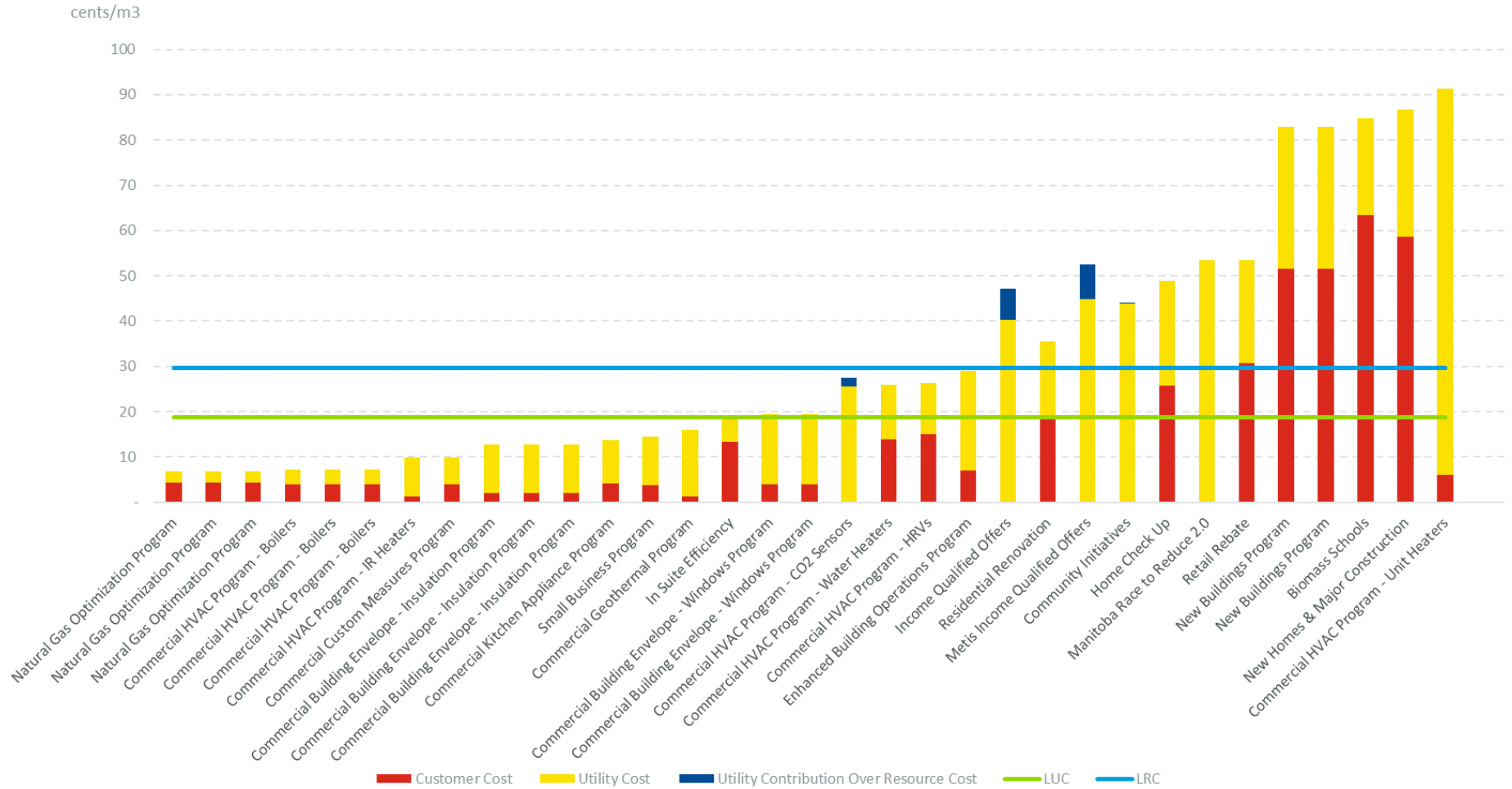
RESPONSE:

- a) Based on the conversation with the PUB, Daymark is providing the requested figures at the program level. The data used to create the following figures are sourced from Efficiency Manitoba's portfolio-level workpapers. Please note that the levelized values presented in the figures do not include any reported interactive effects at the program or portfolio levels.

Electric:



Natural Gas:



b) Confirmed. Income Qualified standard and mid-efficiency furnace replacement measures PACT ratios were measured using PACT Benefits in the numerator and Utility Costs in the denominator. This formula was used for all measures in all programs and portfolios. Please refer to the table below that reports various parameters for both measures extracted from Efficiency Manitoba’s measure-level workpapers.

Measure Name	Total Resource cost (\$)	Utility Cost (\$)	PACT Benefits (\$)	PACT Ratio	Utility’s contribution over resource cost (\$)
2020 LRP (AEP FRP Std Furnace Ind & Comm) Natural Gas CBA	2,638,035	5,390,055	1,327,795	0.25	2,752,020
2020 LRP (AEP FRP Mid Furnace Ind & Comm) Natural Gas CBA	600,945	855,340	100,102	0.12	254,395

c) Refer to PUB/Daymark-I-9 (b).

REFERENCE:

Efficiency Plan p. 566 of 591; Manitoba Hydro 2016/17 DSM Plan 15-Year Supplemental Report Appendix E.3

PREAMBLE TO IR (IF ANY):

Econoler states: “A secondary cost-effectiveness analysis will involve the Total Resource Cost (TRC) test. The Rate Impact Measure test may also be calculated and analyzed for information purposes.”

QUESTION:

- a) Identify which of the cost effectiveness tests used by Manitoba Hydro in its Power Smart and DSM plans to screen DSM measures and develop the portfolio were also used by Efficiency Manitoba. If any of these tests were not used, explain why not.
- b) Explain how the overall cost of the DSM resources factored into the development of the Plan.
- c) Does Efficiency Manitoba agree that cost effectiveness of the portfolio for the program administrator is just one of many factors to consider in developing the portfolio of programs? Does Efficiency Manitoba agree that it would be reasonable to consider PACT as a determinative factor for the overall portfolio, but that Efficiency Manitoba should consider other screens when determining what programs to include in the portfolio?
- d) Explain why it is important to measure the PACT of program bundles.
- e) Of the 14 gas program bundles, eight have PACT scores less than 1.0. Provide quantifiable metrics that support inclusion of these eight bundles in the gas portfolio despite not being cost effective according to the PACT.

RATIONALE FOR QUESTION:

RESPONSE:

- a) 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. Other cost-effectiveness metrics calculated for information purposes can be found in PUB/EM I-11.
- b) Program bundle budgets were reviewed and revised through quantitative analysis and quality control reviews. The revisions are discussed in PUB/EM I-4.
- c) Efficiency Manitoba agrees that the PACT is one of the factors to consider in developing the portfolio of programs. Efficiency Manitoba does not agree that it should consider other cost-effectiveness screens when determining what programs to include in the portfolio. 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. As provided in PUB/EM I-11, information on additional cost-effectiveness test results for program bundles and the overall portfolio have been made available.
- d) The Efficiency Manitoba Regulation requires consideration of the cost-effectiveness by way of the PACT at the portfolio level only. The PACT of each program bundle was provided as additional information.
- e) The Efficiency Manitoba Regulation requires consideration of the cost-effectiveness by way of the PACT at the portfolio level only. The Efficiency Manitoba Regulation does not consider individual program bundles, measures or individual technologies to pass a specific cost-effectiveness test. Inclusion of the eight program bundles within the natural gas portfolio enables Efficiency Manitoba to achieve the legislated natural gas savings target.

REFERENCE:

7-8, 13, 27 & 34
(PDF 210-211, 216, 230 & 237)

PREAMBLE TO IR (IF ANY):

Section A2 of the Application states (pages 7-8):

“In addition, a new “bundled approach” to programming is being introduced. Energy efficiency initiatives in the province previously operated largely as individual programs, most of which were run in a mutually exclusive manner. Efficiency Manitoba has bundled programs that share similar features or comparable delivery models together.”

Section A2 of the Application states (page 13):

“The ideas generated throughout the innovation stage were populated into program models. These models include the program bundle description as well as the program cost-benefit analysis (as outlined below). Program, measure, and/or technology specific cost-benefit analyses were completed and then amalgamated to produce bundled savings, costs, and cost-effectiveness analyses, by customer segment, and at the overall portfolio level”.

Section A2 of the Application states (page 27):

“Efficiency Manitoba analyzed the portfolio, program bundles, and customer segments to quantitatively demonstrate the merits of the Plan. Developing a transparent budget while ensuring stakeholders benefit from the Plan required a detailed and systematic quantitative analysis of costs and benefits associated with proposed programs, offers, and initiatives; this is included within this Section. The quantitative analysis completed included program costs, savings per year, and cost-effectiveness tests. For each of these analyses, multiple perspectives were reviewed through evaluation layers including overall portfolio, customer segment, and program bundle.”

Section A2 of the Application states (page 34):

“Figure A2.2 illustrates the multi-criteria decision framework that allowed Efficiency Manitoba to make program-specific adjustments and selections required to develop the proposed electric and natural gas portfolios. From the quantitative analysis perspective, program costs, savings,

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and cost-effectiveness were primarily relied upon at program bundle, customer segment, and overall portfolio evaluation levels. Cost analysis provided annual electric and natural gas budgets for programs by customer segment, enabling strategies, and corporate overhead. This allowed Efficiency Manitoba to compare customer segments year over year and compare individual bundles within and across customer segments.”

Having identified (through the innovation stage) the individual programs/measures/technologies, the focus of these questions is on the role of “program bundles” in developing the proposed electricity and natural gas portfolios.

QUESTION:

- a) Please clarify whether the electricity and natural gas portfolios were developed by:
 - I. Determining the specific programs/measures/technologies that would be included in each portfolio and then, for purposes of delivery, organizing them into “program bundles”, or
 - II. Using the specific programs/measure/technologies to develop various candidate program bundles and then assessing which candidate program bundles would be included in each portfolio.
- b) If the second of the two approaches outlined in part (a) was used (i.e., candidate program bundles were developed) then please fully describe how Efficiency Manitoba determined which specific programs, measures and technologies should be included in a single “program bundle”.
- c) If the second of the two approaches outlined in part (a) was used (i.e., candidate program bundles were developed) then please provide a schedule that, for each customer segment, sets out all of the individual candidate program bundles that Efficiency Manitoba considered and assessed for purposes of determining its proposed electricity and natural gas portfolios. For each program bundle please indicate:
 - I. The specific programs, measures and/or technologies included
 - II. The targeted end-uses
 - III. The expected savings per participant
 - IV. The percentage of the customer segment’s use of the electricity/natural gas accounted for by the targeted end-use(s)
 - V. Any interactive impacts on other energy requirements
 - VI. The total incremental capital and operating costs for the bundle per participant

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- VII. The environmental impacts (positive and negative) associated with the bundle per participant
 - VIII. The fraction of the labour and materials that will be provided from within Manitoba – exclusive of program costs.
- d) It is noted that the PACT includes the present value of program costs and incentives. If the second of the two approaches outlined in part (a) was used (i.e., candidate program bundles were developed) then did the range of program bundles considered include bundles with the same programs/measures and technologies but different levels of program advertising and incentives (with different associated levels of participation and savings)?
- I. If no, how was the level of program costs (in terms of incentive and advertising) associated with each program bundle determined?
 - II. If yes, how were the different levels of program costs determined?
 - III. If yes, please ensure the response to part (b) treats each case as a separate “program bundle”.
- e) If the second of the two approaches outlined in part (a) was used (i.e., candidate program bundles were developed) then were there programs, measures and/or technologies that were identified during the innovative stage and determined to be aligned with the Act and accompanying Regulation but were not included in any of the program bundles considered as candidates for the proposed portfolios?
- I. If yes, what were they and why were they excluded?

RATIONALE FOR QUESTION:

To understand the role of program bundles and how the program bundles considered for inclusion in the proposed portfolios were developed.

RESPONSE:

- a) Electricity and natural gas portfolios were developed in a manner most closely described by (I). Given the mandated energy savings targets, Efficiency Manitoba approached program design by identifying new measures that could contribute savings and considering how to get more savings from measures already part of Manitoba Hydro’s DSM portfolio. These measures were then grouped to create improved accessibility

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from a customer's perspective ensuring that Efficiency Manitoba had opportunities for all customer types within all customer segments. The program bundle approach to energy savings groups offerings that share features and comparable delivery models, thus reducing paperwork, streamlining the process and providing targeted customer segments with the information they need to make decisions to improve energy efficiency. To illustrate, for customers wanting to pursue a home renovation project, Efficiency Manitoba could present multiple opportunities within the Home Renovations Offer that could be considered within scope of the customers' project including measures such as energy efficient lighting, windows, or insulation upgrades. For customer segments such as income qualified, Indigenous, and Small Business, Efficiency Manitoba assembles the opportunities for those customers into bundles based on customer type.

- b) Not applicable as per response to COALITION/EM I-13a.
- c) Not applicable as per response to COALITION/EM I-13a.
- d) Not applicable as per response to COALITION/EM I-13a.
- e) Not applicable as per response to COALITION/EM I-13a.

REFERENCE:

14-21 (PDF 261-268)

PREAMBLE TO IR (IF ANY):

It is noted that for both the Electric Portfolio and the Natural Gas Portfolio, there is a wide variation in the levelized cost of the individual program bundles within each customer segment.

QUESTION:

- a) For each of the customer segments in the Electric and Natural Gas Portfolios, please indicate if there were specific programs/measures/technologies that are aligned with the Act (and accompanying Regulation) but were not included in the proposed portfolio even though substituting them for one of the planned programs/measures/technologies in the customer segment could have achieved the same level of overall savings but at a lower cost (i.e., the overall levelized cost for the customer segment).
- b) If there are, please identify what they are, to which customer segment they would be applicable and explain (with reference to the various factors considered) why Efficiency Manitoba chose not to include them in the proposed portfolios.
- c) For each of the customer segments in the Electric and Natural Gas Portfolios, please indicate if would it be possible for Efficiency Manitoba to achieve the same level overall savings at a lower overall levelized cost by adopting a more aggressive (e.g. increased advertising/incentive levels) approach for one of the program bundles with a low levelized cost in combination with a less aggressive approach for one of the program bundles with a higher levelized cost?
 - I. If not, why not?
 - II. If yes, please identify where such substitutions could be made.
 - III. If yes, please explain (with reference to the various factors considered) why each such a substitution was not proposed.
- d) For each of the program bundles that involve more than one measure/technology, please indicate if would it be possible for Efficiency Manitoba to achieve the same level overall savings at a lower overall levelized cost by adopting a more aggressive (e.g. increased advertising/incentive levels) approach for one measures/technologies with a

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low levelized cost in combination with a less aggressive approach for one of the measures/technologies with a higher levelized cost?

- I. If not, why not?
- II. If yes, please identify where such substitutions could be made.
- III. If yes, please explain (with reference to the various factors considered) why each such a substitution was not proposed.

RATIONALE FOR QUESTION:

To understand the role of “cost-effectiveness” in the development of the proposed program bundles and overall portfolios.

RESPONSE:

- a) Please see response to PUB/EM I-1a for measures that were not included in the Plan. All of these measures would have resulted in a higher cost portfolio if they were substituted for measures that are currently included.
- b) Please see response to COALITION/EM I-17a and PUB/EM I-1a.
- c) Please see response to COALITION/EM I-19a.
- d) See response to COALITION/EM I-19a.

REFERENCE:

8 (PDF 18)

6-8 (PDF 81-83)

7 and 13 (PDF 210 and 216)

PREAMBLE TO IR (IF ANY):

Section 1 (page 8) of the Application states:

“Within the Plan, a DSM program or initiative refers to a single specific energy-efficient technology or measure that will be offered to Efficiency Manitoba customers. A “program bundle” is a grouping of individual DSM initiatives while the term “portfolio” refers to either the entire electric or natural gas programming including all customer segment program bundles for each of the respective energy sources.”

Section 3 (page 6) of the Application states:

“Within the Plan, a DSM program or initiative refers to a single specific energy-efficient technology or measure that will be offered to Efficiency Manitoba customers. A “program bundle” is a grouping of individual DSM initiatives while the term “portfolio” refers to either the entire electric or natural gas programming which including all customer segment program bundles for each of the respective energy sources.”

Section 2 of the Act states:

““demand-side management initiative” means a measure or action taken, or a program, service or rate designed to reduce the consumption of electrical energy or natural gas, including a resulting reduction in the demand for electrical power, in Manitoba, but does not include (a) a measure, action, program, service or rate that encourages or results in a switch from the use of one kind of fuel source to another if the switch increases greenhouse gas emissions in Manitoba; or

(b) a prescribed measure, action, program, service or rate.”

Regarding the Plan development process, the Application states:

1. “The ideas generated throughout the innovation stage were populated into program models” (Section A2, page 13)
2. “Efficiency Manitoba was able to leverage research that had already been contracted by

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Manitoba Hydro in 2017 by reviewing and incorporating recommendations contained within the resulting Manitoba Hydro DSM Optimization report related to the various strategies that could be used to achieve greater electric and natural gas energy savings.” (Section 3, page 7)

3. “When looking to achieve the mandated savings targets, Efficiency Manitoba started with an analysis of existing individual technologies and program bundles.” (Section 3, page 7)

4. “In order to achieve the savings targets, enhancements to existing DSM programs in Manitoba as well as new programs, offers, and initiatives are included in the Plan.” (Section 3, page 8)

5. “Recognizing cost effectiveness and continuity for established industry and customer benefits, Efficiency Manitoba made strategic choices on continuation of existing energy efficiency programs, offers, and initiatives. Where programs, offers and initiatives will continue, enhancements will be incorporated to address improvement opportunities to capture additional energy savings where practical. Efficiency Manitoba will also introduce new programs.” (Section A2, page 7)

Overall, the focus of this question is on the how Efficiency Manitoba determined the individual measures/technologies/programs that it would subsequently consider for inclusion in what it has termed program bundles.

QUESTION:

- a) For each customer segment, please provide a schedule that sets out: i) the existing programs; ii) the individual measures/technologies associated with each program (where applicable) and iii) the specific enhancements that were considered in the development of the Plan. (Note: The request is not for a listing of the potential enhancements actually included in the Plan but rather a listing of the potential enhancements considered for potential inclusion in the Plan).
- b) For each of the measures/technologies associated with the existing programs and for each of the enhancements considered please provide the following:
 - I. The energy form (natural gas or electricity) targeted
 - II. The customer segment and specific end-use(s) that will be impacted
 - III. The expected savings per participant
 - IV. The percentage of the customer segment’s use of the electricity/natural gas accounted for by the targeted end-use(s) (Note: The request is not for the

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- percentage savings that could be achieved but rather the percentage that the targeted end-use represents of the customer segment's total energy use.)
- V. The life expectancy of the measure/technology/program and expected persistence in savings over that period
 - VI. Any interactive impacts on other energy requirements.
 - VII. The total incremental capital and operating costs for the measure/technology/program per participant
 - VIII. The environmental impacts (positive and negative) associated with the measure/technology/program per participant
 - IX. The fraction of the labour and materials that will be provided from within Manitoba – exclusive of program costs.
 - X. An indication as to whether the measure/technology is included in the proposed portfolios.
- c) Was the sole source for the potential enhancements identified in response to part (c) the DSM Optimization Study? If not, how else were potential enhancements identified?
 - d) Does Efficiency Manitoba view the list of potential enhancements to existing DSM programs it considered for inclusion in the Plan to be a comprehensive list of available opportunities? If yes, why?
 - e) Please fully describe how ideas were generated during the “innovation stage” referenced in Section A2 (page 13).
 - f) As part of the “innovation stage” was an exercise similar to that performed by EnerNOC Utility Solutions Consulting for purposes of completing the Demand Side Management Potential Study filed by Manitoba Hydro in the PUB's NFAT proceeding (Appendix 4.3) undertaken by Efficiency Manitoba in order assist in identifying all potential opportunities? (Note: See Chapter 5 of referenced Study found at http://www.pubmanitoba.ca/v1/nfat/pdf/hydro_application/appendix_04_3_demand_side_management_potential_study.pdf)
 - I. If not, why not and what sources were relied on to identify potential opportunities?
 - II. If yes, please provide a copy of the results.
 - III. Please provide copies of any other sources that were relied on for purposes of identifying programs/measures/technologies for potential inclusion in the proposed portfolio.

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- g) Please provide, for each customer segment, a schedule listing all new technologies/measures/programs considered for inclusion in the Plan. (Note: Again, the request is not for a listing of the new technologies/measures included in the Plan but rather a listing of the new technologies/measures/programs considered for potential inclusion in the Plan). In each case, please indicate:
- I. The energy form (natural gas or electricity) targeted
 - II. The customer segment and specific end-use(s) that will be impacted
 - III. The expected savings per participant
 - IV. The percentage of the customer segment's use of the electricity/natural gas accounted for by the targeted end-use(s). (Note: The request is not for the percentage savings that could be achieved but rather the percentage that the targeted end-use represents of the customer segment's total energy use.)
 - V. The life expectancy of the measure/technology/program and expected persistence in savings over that period
 - VI. Any interactive impacts on other energy requirements
 - VII. The total incremental capital and operating costs for the measure/technology/program per participant
 - VIII. The environmental impacts (positive and negative) associated with the measure/technology/program per participant
 - IX. The fraction of the labour and materials that will be provided from within Manitoba – exclusive of program costs.
 - X. An indication as to whether the measure/technology is included in the proposed portfolios.
- h) Does Efficiency Manitoba view the list of new technologies/measures it considered for inclusion in the Plan to be a comprehensive list of available opportunities? If yes, why?
- i) Apart from excluding programs/technologies/measures not considered to be aligned with the Act and its accompanying Regulation was there any other screening done of potential DSM opportunities prior to establishing those that would be “populated into program models” (per Section A2, page 13)? If yes, what were the screening measures used and what potential programs/technologies/measures were excluded as a result?

RATIONALE FOR QUESTION:

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To understand how Efficiency Manitoba developed the list of initiatives (e.g. measures/technologies) it considered for inclusion in its proposed Efficiency Plan and the results of the exercise.

RESPONSE:

- a) Please see the response to PUB-EM I-1. Programs/measures that Efficiency Manitoba considered but did not put forth in the Plan include: small scale wind, dynamic glazing, real-time energy management, energy storage, residential behavioural, personal comfort systems, advanced rooftop units, solar air pre-heating, HVAC maintenance, and variable refrigerant flow systems. PUB-EM I-1 provides details of the high level screen considerations used to develop a preliminary portfolio.

Supporting documents and workpapers used in the development of the preliminary portfolio for each technology would require an extensive amount of time to gather and coordinate as it is not kept in a centralized repository nor is it available in a consistent format (i.e. background documentation is different for each technology). Efficiency Manitoba has determined there is not adequate time to gather this information; however, two examples of this type of documentation are provided as attachments to PUB-EM I-1.

Further information request/clarification:

COALITION/EM I-10(a) requested a schedule that set out existing programs, individual measures/technologies associated with each program and the potential specific enhancements that were considered in the development of the Plan, for each customer segment. In response, Efficiency Manitoba referred back to PUB/EM I-1, which is limited to identifying measures not included in the Plan. The response does not fully answer the question as it neither addresses existing programs (it only addresses measures not included in the Plan), nor does it address the “enhancements that were considered in the development of the plan.” This response is critical to the examination of the appropriateness of the methods to select or reject demand-side initiatives.

**2020-2023 Efficiency Plan
COALITION/EM I-10a-i****Additional response from Efficiency Manitoba (December 5, 2019):**

Efficiency Manitoba focused its efforts on enhancements included in the Plan and, as such, did not endeavor to document in detail any enhancements considered but not included in the Plan. The requested detail regarding potential enhancements not included in the Plan does not exist and cannot be reasonably and reliably reproduced with reasonable effort.

Please see additional response to COALITION/EM I-10 (g) for additional detail on measures considered during the development of the Plan but which were ultimately not included. Please see also response to DAYMARK/EM I-92 for a table that shows existing programs with enhancements and new measures added by bundle/customer segment.

Note that an enhancement includes: the addition of a new measure / technology to a program bundle; revised incentive structure; changes to product eligibility; or an anticipated improved customer experience through reduction of administrative program requirements.

A high level step by step description of the process Efficiency Manitoba used to design the proposed portfolio of programs, including the methods used to select or reject measures, has been provided in the revised response to COALITION/EM I-14i.

- b) Depending on the results of the high level screen completed and described in PUB-EM I-1, there are a variety of non-quantitative reasons for initiatives to have been rejected including the technology's energy savings claims are not yet proven, unavailability of local supply of the technology, or appropriateness for use in Manitoba's climate. As such, the measure specific data requested is not available. Two examples of the high level screening documentation are provided as attachments to PUB-EM I-1.

Further information request/clarification:

COALITION/EM I-10(b) requested, in relation to part (a), more detailed metrics on the current measures used and the enhancements considered. In response, Efficiency Manitoba referred back to PUB/EM I-1 and indicated that while the measure-specific

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data requested is not available, two examples of the high level screening documentation are provided as attachments to PUB/EM I-1. The response is not responsive as Efficiency Manitoba should be in a position to at least provide the basic attributes for each measure considered for inclusion in the Plan. This response is relevant to the examination of the appropriateness of the methods to select or reject demand-side initiatives.

Additional response from Efficiency Manitoba (December 5, 2019):

Please see revised response to COALITION/EM I-10a regarding detail on measures and enhancements considered but not included in the proposed Plan.

With respect to new technologies and measures included within the electric or natural gas portfolio, there are several information request responses which provide measure level details as follows:

- PUB/EM I-33b identifies all the measures and technologies included within the electric and/or natural gas portfolio by customer segment and program bundle. Status as a new or continuing offer or measure within Manitoba is also provided within the response.
- The Attachment to COALITION/EM I-91 provides measure level resolution with respect to the electric energy savings, electric incentive, natural gas energy savings and natural gas incentive for every measure included within the Portfolio.
- The Attachment to DAYMARK/EM I-13 provides measure level information on free ridership and free driver modeling inputs used to determine measure level energy savings.

Savings by measure, bundle and portfolio was requested in DAYMARK/EM I-97 (electric) and DAYMARK/EM I-98 (natural gas) to which Efficiency Manitoba responded by providing electronic workpapers to Daymark based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark.

- c) Please refer to PUB-EM I-29 for a summary of the differences and enhancements considered within the 2020/23 Efficiency Plan (“Plan”). Some potential enhancements

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such as program bundling were considered based on DSM Optimization Study but this was not the sole source for potential enhancements. Other consultant memo's such as those provided in PUB-EM I-2 were also considered as were alignment with the directions of government (Plan, Section 2.2, beginning on p. 50 of 591), The Efficiency Manitoba Act and Regulation (Plan, Section 2.3, beginning on p. 55 of 591), historical DSM experience in Manitoba, feedback received through the Energy Efficiency Advisory Group and other engagement activities (Plan, Section 3.3, p. 93-94 of 591).

- d) Efficiency Manitoba has considered a reasonable list of available opportunities for potential enhancements. Efficiency Manitoba recognizes that depending on the specific interpretation of "comprehensive" the list of enhancements considered may or may not be considered as such. Efficiency Manitoba looks forward to having additional potential enhancements identified through activities such as staff research, collaboration with industry partners and other program administrators and engagement with stakeholders such as through the Public Utilities Board review process and with the Energy Efficiency Advisory Group. Potential future enhancements will be evaluated according to the considerations outlined in PUB-EM I-1.

- e) Section A2.1 (Plan, p. 206 of 591) summarizes that program innovation was guided by engagement with stakeholders, customers, and the EEAG. This section provides examples of consistent messages and themes heard by Efficiency Manitoba such as the importance of the diversity of energy efficiency offerings; ability for customers to quickly and easily access program information; and streamlined customer participation. These themes along with the considerations outlined in (c) above resulted in both strategic decisions and program ideas. Strategic decisions are outlined with Section A2.1 and include customer market segmentation, scope of customer relationship management & demand side-management system and the program bundling approach. Program ideas were developed using existing Manitoba Hydro energy efficiency program staff. Design teams based on program bundle were formed and these teams generated ideas by working through the high level program screening outlined in (a) above and the development of the program models required complete the preliminary electric and natural gas portfolio. Two examples of the high level screening documentation are provided as attachments to PUB-EM I-1.

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- f) A DSM Market Potential Study was not produced as part of Efficiency Manitoba's exercise to review potential opportunities.
- i. As discussed in the response to DAY/EM I-78, Efficiency Manitoba has budgeted to have a revised potential study completed in order to inform opportunities to be considered in the next 3-year efficiency plan.
DAY/EM I-77 provides an illustration of the programming considerations and sources of information utilized within the residential customer sector. Examples of the other market sources identified from DAY/EM I-77 include: energy use surveys, past program participation, and consultations with industry, information on programs from other jurisdictions from ESource (<https://www.esource.com/>, a service provider specializing in DSM/utility market research) and information available online from utilities/DSM agencies. Providing the supporting documents for each technology would require an extensive amount of time to gather and coordinate as it is not kept in a centralized repository nor is it available in a consistent format (i.e. background documentation is different for each technology).
 - ii. A potential study was not completed.
 - iii. Providing the supporting documents for each technology would require an extensive amount of time to gather and coordinate as it is not kept in a centralized repository nor is it available in a consistent format (i.e. background documentation is different for each technology). Please see response to f) i) above as well as attachments to PUB/EM I-2a.
- g) Depending on the results of the high level screen completed and described in PUB-EM I-1, there are a variety of non-quantitative reasons for initiatives to have been rejected including the technology's energy savings claims are not yet proven, unavailability of local supply of the technology, or appropriateness for use in Manitoba's climate. As such, the measure specific data requested is not uniformly available. Two examples of the high-level screening documentation are provided as attachments to PUB-EM I-1.

Further information request/clarification:

COALITION/EM I-10(g) requested a listing of all new technologies/measures/programs considered for inclusion in the plan, as well as their metrics. In response, Efficiency Manitoba referred back to PUB/EM I-1, which does not address the issue except to imply

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that all potential measures identified were included in the Plan, apart from those discussed. While the Plan includes a number of new measures (see PUB/EM I-4), no details are provided regarding metrics. This response is important for the examination of the appropriateness of the methods to select or reject demand-side initiatives.

Additional response from Efficiency Manitoba (December 5, 2019):

Please see table below for all measures considered during the development of the Plan but which were ultimately not included. Note that Efficiency Manitoba focused its efforts on measures included in the Plan and, as such, did not endeavor to document specific metrics on measures considered but not included in the Plan. See also response to PUB/EM I-4 for details on the high-level screening that was used to exclude measures from further consideration.

Energy Efficiency Technologies Rejected During Pre-Screening Process

Technology	Market
Conductive cow cooling pads for dairy industry	Agricultural
Electronically Commutated Motors (ECM) for barns	Agricultural
Energy storage batteries for homes/buildings that have on-site generation (eg. PV panels).	All
Showerheads with on/off switch	Commercial
Hand dryers	Commercial
Electronic Expansion Valves	Commercial
Net Zero buildings	Commercial
Heavily insulated shipping & receiving doors (rolling doors)	Commercial, Industrial, Agricultural
Heavily insulated single & double exterior pedestrian doors (opaque doors)	Commercial, Industrial, Agricultural
Air curtains or air barriers	Commercial, Industrial, Agricultural
Organic light emitting diode (OLED) lighting	Commercial, Industrial, Agricultural
Aerosol air sealing	Commercial, Industrial, Agricultural
Speed doors	Commercial, Industrial, Agricultural
Smart windows / glass - dynamic glazing (thermochromatic / electrochromatic laminated glazing)	Commercial, Industrial, Agricultural
Solar shading devices	Commercial, Industrial, Agricultural
Horticulture Lighting	Commercial, Industrial,

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	Agricultural
Condensing Rooftop Units	Commercial, Industrial, Agricultural
Ice Machines	Commercial, Industrial, Agricultural
Water saver for commercial buildings	Commercial, Industrial, Agricultural
ECM motors in HVAC equipment	Commercial, Industrial, Agricultural
Economizers	Commercial, Industrial, Agricultural
Stratification countering ceiling fans	Commercial, Industrial, Agricultural
Personal Environmental Control Systems	Commercial, Industrial, Agricultural
Variable Refrigerant Flow systems	Commercial, Industrial, Agricultural
Solar Thermal Walls	Commercial, Industrial, Agricultural
Maintenance Promotion Technology	Commercial, Industrial, Agricultural
Advanced Rooftop Packaged AC-heating upgrades	Commercial, Industrial, Agricultural
Biomass District Heating	All
Outdoor reset controls	All
Pulse-Wave-Modulating Thermostats	All
Outdoor wood boilers	First Nations
Wood Stoves	First Nations
Kit Homes	First Nations
Small Scale Wind	All
Condensing Economizer	Industrial
Roving Energy Managers	Industrial
Support for ISO50001	Industrial
Residential Energy Star Water Heaters	Residential
Home Automation	Residential
Residential Behavioral	Residential
Furnace Filters	Residential
Solar pool heaters	Residential
Window air conditioners	Residential
Dehumidifiers	Residential
Wood pellet heating- purchased	Residential
Tube lighting	Residential
Water heater blankets	Residential

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Ceiling fans	Residential
Bathroom exhaust fans	Residential
Passive Plumbing Stack Vent de-icer	Residential
ECM motors (variable speed)	All
Ductless/Ventless dryers	All
Energy Disclosure (Labeling)	All
Block Heater controller	Residential

- h) Efficiency Manitoba has considered a reasonable list of available opportunities for new technologies / measures. Efficiency Manitoba recognizes that depending on the specific interpretation of "comprehensive" the list of new measures considered may or may not be considered as such. Efficiency Manitoba looks forward to having additional new measures identified through activities such as staff research, collaboration with industry partners and other program administrators and engagement with stakeholders such as through the Public Utilities Board review process and with the Energy Efficiency Advisory Group. Potential future enhancements will be evaluated according to the considerations outlined in PUB-EM I-1.
- i) Please see the response to PUB-EM I-1.

“Efficiency Manitoba agrees that the PACT is one of the factors to consider in developing the portfolio of programs. Efficiency Manitoba does not agree that it should consider other cost-effectiveness screens when determining what programs to include in the portfolio. 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”.⁶³

Based on this response, it would appear that customer rate and bill impacts are an after the fact consideration. Also, based on the question, the same presumably applies to other potential factors Efficiency Manitoba could have considered in its evaluation of the portfolios.

The response is particularly problematic from an integrated resource planning perspective and the application of multi-criteria analysis. Integrated resource planning specifically seeks to recognize that there are a number of criteria that need to be considered in the evaluation and selection of a preferred plan. The purpose of a multiple criteria analysis is to clearly set out the trade-offs that are involved when there are multiple and often conflicting objectives to be considered and demonstrate how they have been balanced in arriving at the preferred plan. Indeed, for the PUB to properly consider the various factors identified in the Act and the associated Regulation it too must understand the trade-offs involved.

Rather than ignoring these other considerations during the decision making process and simply reporting on them afterwards, it is important that all relevant considerations be included in the decision making analysis. There may well be certain criteria such as the savings targets or cost-effectiveness that must be met. However, the fact that there are a range of options available means there is likely more than one way of meeting the “mandatory” objectives. The principles of integrated resource planning require that the

⁶³ PUB/EM I-13 c)

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REFERENCE: Daymark Evidence p.79 to 82; PUB/EM I-11

PREAMBLE:

In response to PUB/EM I-11, EM provided cost effectiveness test results at the bundle level, not the initiative (or measure) level

REQUEST:

- a) Provide the total resource cost ratios, levelized resource costs, PACT ratios, PACT levelized costs, simple customer paybacks, and participating customer cost ratios for each electric measure in the Plan, organized by customer segment. (For the purposes of this information request, the “measure level” is to correspond with the individual workpapers provided by EM)
- b) Provide a table of electric measures that have PACT ratios less than unity along with the 3-year average savings for each measure, ranked by PACT ratio. Include in the table the PACT ratios, total resource cost ratios, levelized resource costs, PACT levelized costs, simple customer paybacks, and participating customer cost ratios for each measure.
- c) Provide the total resource cost ratios, levelized resource costs, PACT ratios, PACT levelized costs, simple customer paybacks, and participating customer cost ratios for each gas measure in the Plan, organized by customer segment.
- d) Provide a table of gas measures that have PACT ratios less than unity along with the 3-year average savings for each measure, ranked by PACT ratio. Include in the table the PACT ratios, total resource cost ratios, levelized resource costs, PACT levelized costs, simple customer paybacks, and participating customer cost ratios for each measure.
- e) Explain the implications to the PUB’s review of the Plan in light of Act s.11(b) and the overall benefits to Manitobans of any measures which have both a PACT and TRC ratio less than unity.

RESPONSE:

a)-d) Please see PUB/Daymark I-8a-d CSI Attachment that includes the requested information, which was extracted from measure-level workpapers developed by Efficiency Manitoba.

e) Based on the conversation with PUB, Daymark prepared the response in light of Act s.11(4).b which states

11(4) In reviewing an efficiency plan and making recommendations to the minister, the PUB must consider

(a) the net savings required to meet the savings targets and the plans to address any existing shortfall;

(b) the benefits and cost-effectiveness of the initiatives proposed in the plan;

The program administrator cost test (PACT) considers direct benefits and costs directly related to utility or program administrators. The Total Resource Cost (TRC) test considers direct benefits and any quantifiable non-energy benefits and the total cost necessary to implement the program.

Measures with PACT resulting lower than unity means that, on a net present value basis, the cost of implementing the measures are more than the benefits accrued for the utility or program administrator. Since PACT only considers benefits and costs associated with the program administrator or utility, the cost-effectiveness based on the TRC test could be relevant to assessing overall benefits to Manitobans. Measures with a TRC test resulting lower than unity, at the present value, have larger total costs than total benefits associated with them.

The implications for Manitobans are that the programs with benefit/cost ratios below unity increase the cost of electric or natural gas service to the Province, to the extent that all the benefits have been incorporated into the analysis. An example of benefits that are possible but not included is the contributions that the funding of these programs makes to securing more lasting savings through market transformation. However, even if there are no additional benefits, it does not mean that measures should be removed from the Plan just based on the PACT or TRC cost-effectiveness. It would make sense to consider whether these measures are driven by other reasons, such as strategic market transformation; social, energy or environmental policy; or assuring access to the broad cross section of Manitobans before making any recommendation as to whether to include or exclude them from the Plan.

Response to PUB 1-8 (a): CSI INFORMATION

ELECTRIC MEASURES

Table with columns: Measure by Sector, TBC Ratio, Levelled Resource Cost, PACT Ratio, PACT Levelled Cost, Customer Payback Ratio, Participant Cost Ratio. Includes sub-sections: Commercial, Industrial, Residential, and Misc Electrical. Lists various measures like Air-Cooled Chillers, Dishwashers, LED lighting, and HVAC systems with their respective ratios and costs.

Interactive Effects and Costs extracted from Efficiency Manitoba's measure-level workpapers - included as a separate table

Table with columns: Measure by Sector, TBC Ratio, Levelled Resource Cost, PACT Ratio, PACT Levelled Cost, Customer Payback Ratio, Participant Cost Ratio. Lists measures like SFP - LED Exit Sign, PMSB - LED Exit Sign, and various lighting fixtures with their ratios and costs.

Response to PUB 1-8 (b): CSI INFORMATION

ELECTRIC MEASURES

Measures by Sector	PACT Ratio	TRC Ratio	Levelized Resource Cost	PACT Levelized Costs	Customer Payback Ratio	Participant Cost Ratio
Commercial						
LED Exit Sign EL					2	1.74
Night Covers - Electric					0	2.35
CLP Backlit Signage + Admin					6	1.32
Race to Reduce 2.0 Elec					0	2.05
CBEP Insulation - Air Tightness					0	1.62
Griddle Electric					1	1.66
T8 Ballast EL					6	1.21
In Suite WES EL Shower Head					0	1.64
Race to Reduce Elec					0	1.34
CBEP Curtain Wall - Cooling - NG Projects					0	0.00
CBEP Curtain Wall - Cooling EL Projects					0	0.00
CBEP Insulation - Cooling - EL Projects					0	0.00
CBEP Insulation - Cooling - NG Projects					0	0.00
CBEP Windows - Cooling - EL Projects					0	0.00
CBEP Windows - Cooling - NG Projects					0	0.00
Dimmer EL					0	0.71
EBOP Maint Elec					0	0.62
Electrical Permit EL					0	1.00
Gaskets & Strip Curtains - Electric					0	8.60
HVAC CO2 Sensor Gas heat Elec Cooling					0	0.00
NG to Geo Elec Load Growth					0	0.00
Income Qualified						
2020 LRP (AEP Ind & Comm Smart Thermostat) Electric CBA					0	1.53
2020 LRP (AEP MURB - Air Sealing & Admin) Electric CBA					0	1.04
Indigenous						
FNSBP - T8 8ft Tandem Ballasts EL					0	2.08
SBP - LED Exit Sign EL					0	2.03
SBP - T8 Ballasts EL					0	1.49
2020 LRP (Metis - Appliances) Electric CBA					0	1.48
2020 LRP (FN Smart Thermostat) Electric CBA					0	1.53
2020 LRP (Metis - Smart Thermostat) Electric CBA					0	1.53
2020 LRP (FN Appliances - clothes washer) Electric CBA					0	1.29
FN DI Air Sealing					0	1.00
FNSBP - Dimmer EL					0	1.00
FNSBP - Electrical Permits					0	1.00
Industrial						
Energy Manager (EMI) V2					0	1.31
Energy Manager (EMI) V1					8	0.46
Energy Manager (SEM Cohorts) yr1					1	0.98
Residential						
Instant - Fixtures - In-year Y2 (Elec)					0	58.48
Home Check Up A-line bulbs - In-Year - Y1 (Elec)					0	0.00
Appliances-Refrigerators Electric					0	4.41
Online - Appliance_Refrigerators (Electric)					0	4.38
Instant - A-line bulbs - In-Year Y3 (Elec)					0	7.52
DSM (SCHOOL LED bulbs - In-Year - Y2) CBA - EL					0	0.00
Home Check Up A-line bulbs - In-Year - Y2 (Elec)					0	0.00
DSM (School Program) CBA - EL Timer					0	2.82
Bar Fridges (Electric)					15	0.77
Instant - Fixtures - In-year Y3 (Elec)					0	37.30
Window Air Conditioners (Electric)					5	0.76
DSM (SCHOOL LED bulbs - In-Year - Y3) CBA - EL					0	0.00
Appliances-Dishwashers Electric					199	0.10
Online - Appliance_Dishwashers (Electric)					201	0.10
Home Check Up A-line bulbs - In-Year - Y3 (Elec)					0	0.00
Residential Pool Pump Electric Combo					3	1.77
DSM (School Program) - EL Tier 2 APS					0	1.38
Cold Climate Air-Source Heat Pump Electric					16	0.94
DSM (Home Check Up) - EL Tier 2 APS					0	1.26
Audits & Bundling Bonus Electric					0	1.67
DSM (SCHOOL LED bulbs - Persisting) CBA - EL					0	0.00
Home Check Up A-line bulbs - Persisting (Elec)					0	0.00
Instant - A-line bulbs - Persisting Y4+ (Elec)					0	0.00
Instant - Fixtures - Persisting Y4+(Elec)					0	0.00
Instant - Specialty bulbs - Persisting Y4+ (Elec)					0	0.00
New Electric 50yr Tech					17	1.23
New Gas 20yr elec tech					8	2.20

1c, 2b, 4a

Response to PUB 1-8 (c): CSI INFORMATION

NATURAL GAS MEASURES

Measures by Sector	TRC Ratio	Levelized Resource Cost	PACT Ratio	PACT Levelized Costs	Customer Payback Ratio	Participant Cost Ratio
Commercial						
Bathroom Aerator NG					0	10.20
Boilers (Gas)					4	3.61
CBEP Attic Cavity - SBP					0	4.57
CBEP Curtain Wall - 330 Portage Project					18	1.06
CBEP Curtain Wall - NG Heat					6	1.79
CBEP Doors - NG Heat					5	2.16
CBEP Insulation - Air Tightness					1	1.19
CBEP Insulation - Heating					3	2.58
CBEP Insulation - Heating - Below Grade					3	2.40
CBEP Windows - NG Heat					1	2.35
Convection Ovens Gas					0	41.50
Custom Measures					4	2.90
EBOP Gas					3	1.48
EBOP Lite Gas					2	2.12
EBOP Maint Gas					0	0.62
Fryers Natural Gas					3	2.23
Griddle Natural Gas					0	2.13
HRVs Gas					15	1.28
HVAC CO2 Sensor Gas					0	2.00
In Suite HRV Control NG					8	1.49
In Suite WES NG Bathroom Aerators					0	16.19
In Suite WES NG Kitchen Aerators					0	18.66
In Suite WES NG Pipe Wrap					0	5.13
In Suite WES NG Shower Head					0	5.65
IR Heaters					3	3.12
Kitchen Aerator NG					0	8.86
Manitoba Race to Reduce 2.0 Gas					0	1.38
Manitoba Race to Reduce NG					0	1.17
New Buildings 2.1					34	0.64
New Buildings 3.0					46	0.56
New Buildings NZF					79	0.68
Income Qualified						
NG to Geo (NG Savings)					8	2.37
Smart Thermostat Assumptions Gas					23	0.51
Smart Thermostat NG					4	1.37
Spray Valve NG					0	22.81
Steamers Natural Gas					1	3.07
Unit Heaters					7	1.18
Water Heaters - Tank					11	1.31
Water Heaters - Tankless					3	4.41
Indigenous						
2020 LRP (AEP MURB - Air Sealing & Admin) Natural Gas CBA					0	1.01
2020 LRP (AEP FRP Boiler Ind) Natural Gas CBA					0	2.26
2020 LRP (AEP FRP Mid Furnace Ind & Comm) Natural Gas CBA					0	1.67
2020 LRP (AEP FRP Std Furnace Ind & Comm) Natural Gas CBA					0	2.80
2020 LRP (AEP Ind & Comm - Insulation) Natural Gas CBA					0	4.24
2020 LRP (AEP Ind & Comm - LED) Natural Gas CBA					0	0.00
2020 LRP (AEP Ind & Comm - WESP) Natural Gas CBA					0	13.43
2020 LRP (AEP Ind & Comm Appliances) Natural Gas CBA					0	0.00
2020 LRP (AEP Ind & Comm Smart Thermostat) Natural Gas CBA					0	1.46
2020 LRP (AEP MURB - LED) Natural Gas CBA					0	0.00
2020 LRP (AEP MURB - WESP) Natural Gas CBA					0	5.13
Industrial						
Energy Manager (EMI)					0	0.00
Energy Manager (SEM Cohorts) yr1					0	0.00
Large Projects yr2					2	4.10
Large Projects yr3					5	1.90
NG Optimization Program					6	2.78
Residential						
DSM (EVENT) CBA - NG PW					0	2.88
DSM (Home Check Up) CBA - Window Kits (Natural Gas)					0	1.46
A la Carte Gas Bungalow					28	0.72
A la Carte Gas Cabover					28	0.78
Air Sealing Gas					0	2.07
Appliances-Washer&Dryers Gas					0	0.00
Audits & Bundling Bonus Gas					0	1.67
DSM (EVENT) CBA - NG BA					0	7.31
DSM (EVENT) CBA - NG KA					0	8.34
DSM (EVENT) CBA - NG SH					0	2.65
DSM (Home Check Up HRV Control) CBA - NG					8	1.49
DSM (Home Check Up) CBA - NG BA					0	26.73
DSM (Home Check Up) CBA - NG PW					0	6.44
DSM (Home Check Up) CBA - NG SH					0	7.88
DSM (Home Check Up) CBA - NG Timer					0	9.29
DSM (Home Check Up) CBA - Weatherstripping (Natural Gas)					0	2.78
DSM (Home Check Up) CBA - NG KA					0	30.92
DSM (School Program) CBA - NG BA					0	26.91
DSM (School Program) CBA - NG KA					0	31.12
DSM (School Program) CBA - NG PW					0	6.48
DSM (School Program) CBA - NG SH					0	7.93
DSM (School Program) CBA - NG Timer					0	2.24
DSM (School Program) CBA - Window Kits (Natural Gas)					0	1.46
DSM (School Program)p CBA - Weatherstripping (Natural Gas)					0	2.79
DWHR Gas					24	0.89
Gas Savings Assumptions					23	0.51
Home Insulation Gas 3-yr combo					10	1.59
HRV Controls Gas					1	2.38
Instant - Other Tech_1.5 GPM Showerheads (Natural Gas)					1	6.07
Instant - Other Tech_Weatherstripping (Natural Gas)					3	2.13
Instant - Other Tech_Window Kits (Natural Gas)					2	0.78
New Gas 20yr Tech					0	1.80
New Gas 50yr Tech					80	0.28
Online - Appliance_Clothes Washers & Dryers (Natural Gas)					0	0.00
Online - Appliance_Dishwashers (Natural Gas)					0	0.00
Online - Smart Thermostats (Natural Gas)					20	0.68
Reno Gas CBA					26	0.91
Residential Geo Yr 1-5 Gas					31	0.61
smart Thermostats Gas					19	0.65
Windows and Doors Doors Gas					8	1.94
Windows and Doors Gas_Windows					8	1.94

1c, 2b, 4a

Interactive Effects and Costs extracted from Efficiency Manitoba's measure-level workpapers - included as a separate table

Measures by Sector	TRC Ratio	Levelized Resource Cost	PACT Ratio	PACT Levelized Costs	Customer Payback Ratio	Participant Cost Ratio
Residential						
Home Check Up Lighting Y1 Gas IE						
Home Check Up Lighting Y2 Gas IE						
Home Check Up Lighting Y3 Gas IE						
Home Check Up Lighting Y4+ Gas IE						
LED Gas Interactive Effects (IE)						
Res Reno Appliances Combo (Natural Gas IE)						
Residential Pool Pumps - Natural Gas Interactive Effects						
Home Check Up - Costs						
DSM (Event) Admin Cost						
Instant Admin Cost Gas						
Online Admin Cost Natural Gas						
Income Qualified						
2020 LRP (AEP Ind & Comm - AS & HEA, Admin Costs) Natural Gas CBA						
Indigenous						
2020 LRP (Metis - AS & HEA, Admin Costs) Natural Gas CBA						

1c, 2b, 4a

Response to PUB 1-8 (d): CSI INFORMATION

NATURAL GAS MEASURES

Measures by Sector	PACT Ratio	TRC Ratio	Levelized Resource Cost	PACT Levelized Costs	Customer Payback Ratio	Participant Cost Ratio
Commercial						
Griddle Natural Gas					0	2.13
EBOP Gas					3	1.48
HVAC CO2 Sensor Gas					0	2.00
Smart Thermostat NG					4	1.37
New Buildings NZE					29	0.68
New Buildings 2.1					34	0.64
New Buildings 3.0					46	0.56
Manitoba Race to Reduce 2.0 Gas					0	1.38
Unit Heaters					7	1.18
CBEP Insulation - Air Tightness					1	1.19
Manitoba Race to Reduce NG					0	1.17
EBOP Maint Gas					0	0.62
Income Qualified						
2020 LRP (AEP FRP Boiler Ind) Natural Gas CBA					0	2.26
2020 LRP (AEP Ind & Comm Smart Thermostat) Natural Gas CBA					0	1.46
2020 LRP (AEP FRP Std Furnace Ind & Comm) Natural Gas CBA					0	2.80
2020 LRP (AEP FRP Mid Furnace Ind & Comm) Natural Gas CBA					0	1.67
2020 LRP (AEP MURB - Air Sealing & Admin) Natural Gas CBA					0	1.01
2020 LRP (AEP Ind & Comm - LED) Natural Gas CBA					0	0.00
2020 LRP (AEP Ind & Comm Appliances) Natural Gas CBA					0	0.00
2020 LRP (AEP MURB - LED) Natural Gas CBA					0	0.00
Indigenous						
2020 LRP (Metis - Insulation) Natural Gas CBA					0	2.36
2020 LRP (Metis - FRP Boiler) Natural Gas CBA					0	2.26
2020 LRP (Metis - Smart Thermostat) Natural Gas CBA					0	1.46
2020 LRP (Metis - FRP Std Furnace) Natural Gas CBA					0	2.45
2020 LRP (Metis - FRP Mid Furnace) Natural Gas CBA					0	1.52
2020 LRP (Metis - Appliances) Natural Gas CBA					0	0.00
2020 LRP (Metis - LED) Natural Gas CBA					0	0.00
Industrial						
Energy Manager (EMI)					0	0.00
Residential						
Windows and Doors Doors Gas					8	1.94
Instant - Other Tech_Window Kits (Natural Gas)					2	0.78
Air Sealing Gas					0	2.07
Online - Smart Thermostats (Natural Gas)					20	0.68
A la Carte Gas Cabover					28	0.78
DSM (School Program) CBA - NG Timer					0	2.24
DSM (School Program) CBA - Window Kits (Natural Gas)					0	1.46
DSM (Home Check Up) CBA - Window Kits (Natural Gas)					0	1.46
New Gas 20yr Tech					0	1.80
Appliances-Washer&Dryers Gas					0	0.00
Audits & Bundling Bonus Gas					0	1.67
New Gas 50yr Tech					80	0.28
Online - Appliance_Clothes Washers & Dryers (Natural Gas)					0	0.00
Online - Appliance_Dishwashers (Natural Gas)					0	0.00

1c, 2b, 4a

REFERENCE:

1, lines 9-12 (PDF 313)

PREAMBLE TO IR (IF ANY):

Regarding Appendix A, Section A5, p. 1, lines 9-12: EM states that its income qualified program will offer “free insulation upgrades, a high efficiency natural gas furnace for \$9.50 per month for five years or a \$3000 rebate for a high efficiency natural gas boiler, and free energy-efficient devices such as LED bulbs, energy-efficient showerheads , and faucet aerators.”

QUESTION:

- a) What level of efficiency (AFUE) would the efficient furnace be?
- b) What would the expected annual gas bill reduction from the efficient furnace be (in dollars)? Please provide the basis for the estimate provided.
- c) Why is a monthly co-payment required for an efficient furnace but a rebate is offered for an efficient boiler? Why the difference between heating system types? Why not offer the option of either a monthly co-payment or a fixed rebate for both equipment types?
- d) Why are there not similar offers for efficient electric heat pumps for low income customers who heat primarily with electricity?

RATIONALE FOR QUESTION:

To better understand the basis for Efficiency Manitoba's proposed income qualified program.

RESPONSE:

- a) The high efficiency furnace available under the Income Qualified Offer is a minimum efficiency of 94% (AFUE).

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- b) Please see the table provided in the response to COALITION/EM I-104 for the estimated average annual bill reduction. The assumptions for this estimate are also included in the table.
- c) The incentive structure for Income Qualified Offers is a continuation from Manitoba Hydro's Affordable Energy Program (which was mandated through Order 85/13). Efficiency Manitoba has decided to continue with furnace and boiler replacements using the same incentives. Please see the response to PUB/EM-10a for a description of why the Furnace Replacement Program is being continued.

The rebate structure is part of the program's marketing/pricing strategy to help the customer evaluate the impacts to their monthly payments. For furnace the placements, the monthly payment of \$9.50 per month is promoted as a loan payment based on \$570 over a five year term at zero percent interest to the owner. The customer co-payment is \$570 which is collected over a 60 month timeframe. Boiler upgrades are very infrequent, can be quite complex, and that the cost can vary greatly, typically ranging anywhere from \$6,000 to \$13,000. The incentive of \$3,000 leaves the customer's remaining balance after the incentive ranging from \$3,000-\$10,000. While some customers choose to make the full payment upfront, the program also offers additional flexible low-interest financing arrangements which can be amortized over 5, 10, or 15 years to ensure loan payments are manageable for a lower income customer.

- d) The installation of heat pumps is available to all customers through Home Renovation Offers but has not been considered a measure under the Income Qualified portfolio because of the high upfront cost required for the installation of heat pumps and the observed demographics of the lower income market (i.e. predominantly gas available areas). The goal of Income Qualified Offers is to facilitate energy efficiency upgrades to reduce energy bills, while minimizing the financial burden. Installation of a heat pump would result in a significant contribution on the part of a customer and, in a situation where it is replacing a gas heating system, not result in significant bill impacts. The Community Geothermal Program however does address the installation of heat pumps in First Nation Communities as a result of their predominantly high usage of electricity as their home heating source.

REFERENCE:

12-21 (PDF 259-268)

PREAMBLE TO IR (IF ANY):

It is noted that for both the Electric Portfolio and the Natural Gas Portfolio, there is a wide variation in the levelized cost of the individual program bundles across the customer segments.

QUESTION:

- a) With respect to the Electric Portfolio, it is noted that the levelized costs of some of the program bundles in the Indigenous and Income Qualified Segments are less than the levelized cost for some of the program bundles proposed for the other segments. Would it be possible for Efficiency Manitoba to achieve the same level overall portfolio savings at a lower overall levelized cost by adopting a more aggressive (e.g. increased advertising/incentive levels) approach for one of the lower levelized cost program bundles in the Indigenous and Income Qualified Segments in combination with a less aggressive approach for one of the program bundles with a higher levelized cost in the one of the other segments?
- I. If not, why not?
 - II. If yes, please identify where such substitutions could be made.
 - III. If yes, please explain (with reference to the various factors considered) why each such a substitution was not proposed.
- b) In general, for each of the Electric and Natural Gas Portfolios, are there customer segments where it be possible for Efficiency Manitoba to achieve the same level overall portfolio savings at a lower overall levelized cost by adopting a more aggressive (e.g. increased advertising/incentive levels) approach for one of the lower levelized cost program bundles in the segment in combination with a less aggressive approach for one of the program bundles with a higher levelized cost in one of the other segments?
- I. If not, why not?
 - II. If yes, please identify where such substitutions could be made.
 - III. If yes, please explain (with reference to the various factors considered) why each such a substitution was not proposed.

RATIONALE FOR QUESTION:

To understand the role of “cost-effectiveness” in the development of the proposed program bundles and overall portfolios.

RESPONSE:

- a) The design of the Plan provides for an inclusive and diverse efficiency portfolio that considers all customer segments with a variety of energy efficient offers and programs within customer segments. The Plan achieves savings targets and is cost-effective with low rate impacts and meets requirements set in legislation, regulation and direction issued by Government. In the course of developing its Plan, Efficiency Manitoba did not undertake a sensitivity analysis changing detailed level components such as advertising frequency and incentive levels and re-modelling the overall Plan metrics. The types of scenarios requested are not readily available and cannot be completed in the timelines set out for the public review of the Plan.

If during implementation of the Plan, more aggressive approaches are required for specific segments than originally planned and/or if actual take-up varies from Efficiency Manitoba’s prudent projections, a counterbalance would need to occur in another area of the Plan in order for Efficiency Manitoba to remain within the overall budget approved for the Plan. This level of flexibility will be essential to successfully implementing a plan that needs to be responsive to customer and market changes and expectations that are likely to occur over the course of the Plan.

- b) See response above to COALITION/EM I – 19a.

REFERENCE:

11 (PDF 167)

17-21 (PDF 264-268)

PREAMBLE TO IR (IF ANY):

It is noted that, with respect to the Natural Gas Portfolio, the program bundles proposed for the Income Qualified and Indigenous segments have the highest levelized cost. It is also noted that the budget for these two segments is 32% of the Natural Gas Portfolio's total budget.

QUESTION:

- a) Would it be possible for Efficiency Manitoba to achieve the same level overall Natural Gas portfolio savings at a lower overall levelized cost by adopting a less aggressive (e.g. lower advertising/incentive levels) approach for one or more of the program bundles in the Income Qualified and Indigenous Segments in combination with a more aggressive approach for one of the program bundles with a lower levelized cost in one of the other segments, while still meeting the 5% budget criterion for such programs?
- I. If not, why not?
 - II. If yes, please identify where such substitutions could be made.
 - III. If yes, please explain (with reference to the various factors considered) why each such a substitution was not proposed.

RATIONALE FOR QUESTION:

To understand the proposed budget Natural Gas portfolio hard to reach segments.

RESPONSE:

The design of the Plan provides for an inclusive and diverse efficiency portfolio that considers all customer segments. The Plan achieves savings targets and is cost-effective with low rate impacts.

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In the course of developing its Plan, Efficiency Manitoba did not undertake a sensitivity analysis changing detailed level components such as advertising frequency and incentive levels. Such scenarios are not readily available and cannot be completed in the timelines set out for the public review of this Plan.

REFERENCE:

pp. 18-25 (PDF 93-100) Section 3

PREAMBLE TO IR (IF ANY):

A cornerstone of the customer-focused approach (p. 18 starting at line 295) appears to be engagement with the representatives of the Energy Efficiency Advisory Group (EEAG). A synopsis of member feedback is provided (p. 20 starting at line 345).

QUESTION:

Please identify how member feedback was incorporated in the Efficiency Manitoba Plan. Where feedback was not incorporated, please provide a brief explanation/justification of that decision.

RATIONALE FOR QUESTION:

To understand how the feedback received from the EEAG was incorporated or not in the Efficiency Manitoba Plan.

RESPONSE:

Efficiency Manitoba received feedback from the EEAG members through 6 group meetings and 4 member-specific meetings that were held between May and September of 2019.

In addition to the recommendations incorporated into the first 3-Year Efficiency Plan (the Plan) and detailed on pages 92 through 94 of the submission (continuity of programs, streamlined application process, new program requests, customer focused approach), Efficiency Manitoba also received suggestions that will be operationalized as the Plan is carried out. For example, both SCO and MKO recommended that meaningful two-way engagement be a priority in the implementation of the Plan.

The following lists recommendations that were made by EEAG members but were not able to be incorporated into the Plan or the Plan development process:

1. General public consultation to obtain input into the Plan was not possible due the time available for Plan development as well as the government and crown communication black out that was required from June to September under the Elections Communications Act.
2. Alternative DSM portfolios designs were not possible due to the time available for Plan development.
3. Strategies to encourage electric vehicles in Manitoba were not incorporated due to the absence of this activity in the Efficiency Manitoba Regulation 119/2019.
4. Per-unit energy savings (claiming savings based on a lower energy intensity for production even though overall energy increases) were not addressed as this was an unfamiliar concept to Efficiency Manitoba and required more investigation as to the plausibility of claiming savings in this scenario.

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REFERENCE:

4 of 40, lines 54-56 (PDF 207) Appendix A Section A2

PREAMBLE TO IR (IF ANY):

Efficiency Manitoba states that " It is important to understand where technologies reside on the market adoption curve and identify new and emerging technologies with limited availability in the Manitoba market."

QUESTION:

- a) Please describe the process that Efficiency Manitoba carried out to accomplish the objective of identifying new and emerging technologies.
- b) Please provide all data sources that Efficiency Manitoba reviewed and consulted to accomplish the objective of identifying new and emerging technologies.
- c) Please explain the process that Efficiency Manitoba carried out to determine which of the new and emerging technologies it identified to include in its proposed programs.
- d) Please identify any and all new and emerging technologies that Efficiency Manitoba identified, but did not include in its proposed programs.

RATIONALE FOR QUESTION:

Understanding how Efficiency Manitoba addressed new and emerging technologies is necessary to ensure that all relevant savings opportunities were addressed.

RESPONSE:

- a) In order to identify new and emerging opportunities, design teams comprised of staff with diverse technical and marketing background worked together to identify and catalogue a list of emerging technologies that are either being utilized or under development in other jurisdictions. The list was then screened to determine applicability to the Manitoba market and specific customer segments.

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- b) Efficiency Manitoba monitors the energy conservation landscape to keep abreast of new technologies, strategies and trends. One way of identifying trends in the energy efficiency industry is by reviewing secondary research, such as webinars, conference presentations, white papers and newsletters, published by a variety of reputable organizations. As per page 425 and 426 of the Plan, several organizations that specialize in energy efficiency include E-Source, American Council for an Energy-Efficient Economy, Natural Resources Canada, Smart Electric Power Alliance, American Society of Heating, Refrigeration, and Air-Conditioning Engineers, and Association of Energy Service Professionals.

Primary research was also conducted during analysis of the responses to the Stakeholder Engagement Survey (Efficiency Plan Section 3.3.2) and EEAG meeting notes (Efficiency Plan Section 3.3.1), as well as reviewing the direct feedback received through existing energy efficiency programs.

- c) Upon creating a catalogue of new opportunities, Efficiency Manitoba researched which would be relevant to Manitoba's climate and energy consumption habits. Staff then liaised with industry on market readiness for new technologies, both from a supply and knowledge perspective. If relevant, staff also reviewed regulatory hurdles which may impede adoption of a technology based on the current regulatory environment. Technologies which remained after this preliminary screening were analyzed to determine the energy savings potential, costs, market adoption, product life span, etc. This information was input into a cost benefit analysis screening tool.
- d) Technologies that were identified by Efficiency Manitoba however did not make it into the proposed plan include: small scale wind, dynamic glazing, real-time energy management, energy storage, solar pool heaters, solar thermal water heating, personal comfort systems, advanced rooftop units, solar air pre-heating, residential behavioural program and variable refrigerant flow systems.

7

Consumer Petro/Oil/Gas sector loads, the next new generation resource is not needed until approximately 2040, even with new export contract obligations since the NFAT. The 2017 marginal value is lower than the 2013 marginal value by approximately one-third, which affects the economics of demand side management programs. As well, as noted by Manitoba Hydro and expert witnesses in the proceeding, rate increases above inflation will themselves have a conservation impact.

The Board finds that, in light of the new, lower, levelized marginal value, some of Manitoba Hydro's demand side management programming may no longer be cost effective. This was acknowledged by Manitoba Hydro witnesses and is not contested. Consumer rates should not, at this time, recover the costs of demand side management programs that are no longer cost effective, unless justified by having a lower-income target market. Given the evidence adduced in this proceeding about energy poverty and bill affordability, it is reasonable for consumer rates to recover the costs of lower-income demand side management programs, even if not cost effective as assessed against the new lower marginal value.

In light of the above, the Board recommends that Manitoba Hydro reduce its demand side management spending. Manitoba Hydro should review its demand side management programming for cost effectiveness and cease or modify spending on programs that are no longer cost effective, except for programs targeted at lower-income and First Nations on-reserve consumers. In addition to continued Utility investment in lower-income demand side management programs, the Board recommends that the provincial government amend Efficiency Manitoba's mandate to explicitly include consideration of bill affordability. This would include targeting of lower-income consumers with demand side management programs, as well as consideration of the impact of demand side management costs being paid by non-participants.

RECOMMENDATION:

Continue emergency assistance: Manitoba Hydro to continue to provide emergency assistance programming (e.g. Neighbours Helping Neighbours) and further evaluate: whether/how existing program meets the needs of low-income ratepayers; and whether Manitoba Hydro should better leverage partners (i.e. Salvation Army) and/or approach other organizations, including charitable/provincial/federal partners, to consider greater collaboration and synergies.

8.4 Landlord and tenant incentives

Lower-income customers that reside in Manitoba Housing units, as well as the private rental market and their landlords, may not be taking full advantage of energy-efficiency investments that could result in reduced energy bills. In buildings where tenants are responsible for paying their own energy bills, landlords have little or no incentive to improve the energy-efficiency of their units (including appliances, where applicable), because this would entail absorbing the costs associated with these investments without realizing much direct benefit. Tenants may be hesitant to invest in the energy-efficiency of their rented dwelling if they do not expect to stay there long term, or may not be permitted to undertake such investments even if they wanted to.

In response to these unique circumstances, the concentration of lower-income customers in provincially funded buildings, and in support of increased energy-efficiency in this portion of Manitoba Hydro's customer base, the Working Group identified an important first step involves increased collaboration between Manitoba Hydro and a variety of key organizations to identify barriers and opportunities to leverage and increase landlord/tenant incentives that could be considered, or mandated, by the Province.

RECOMMENDATION:

Reduce barriers to landlord and tenant participation: Manitoba Hydro work with Employment and Income Assistance, the Residential Tenancies Branch, the Professional Property Management Association, the Winnipeg Rental Network, Manitoba Housing, All Aboard, First Nations, tribal councils, Manitoba Metis Federation, other Indigenous entities, neighborhood renewal organizations, the provincial government and other large lower-income housing providers to investigate opportunities to reduce barriers to landlord/tenant participation and/or increase landlord participation in affordable energy programs including energy-efficiency and weatherization initiatives.

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qualifying lower-income customers to promote the replacement of residential electric heating systems with high-efficiency natural gas furnaces in areas where natural gas service is available, and to further explore the development of incentive programs to promote residential space heating conversions from electricity to biomass, geothermal or heat-pump technologies, if those programs are determined to be or can be made to be economically viable.

Efficiency Manitoba Plan: With respect to fuel switching, conversion of an electric heating system to natural gas is not aligned with both the Efficiency Manitoba Act and accompanying Regulation as this would result in an increase in GHG emissions and therefore is not included in the Plan for lower income customers or otherwise.

Conversion of a heating source from natural gas or electric to a biomass source is included in the Plan as there would be either a decrease in GHG emissions in the case of an existing natural gas heating source or a negligible change in GHG emissions in the case of an existing electric heating source. A conversion of an electric supply from grid electricity to another renewable energy source of distributed generation such as solar, bioenergy, or waste products is included as there would be a negligible change in GHG emissions. Offerings for technologies such as geothermal, bioenergy and solar photovoltaic are for all customer segments and not specific to income qualified customers. Financing is also available for these projects under the Home Energy Efficiency Loan.

- **Recommendation:** Manitoba Hydro work with Employment and Income Assistance, the Residential Tenancies Branch, the Professional Property Management Association, the Winnipeg Rental Network, Manitoba Housing, All Aboard, First Nations, tribal councils, Manitoba Metis Federation, other Indigenous entities, neighborhood renewal organizations, the provincial government and other large lower income housing providers to investigate opportunities to reduce barriers to landlord/tenant participation and/or increase landlord participation in affordable energy programs including energy efficiency and weatherization initiatives.

Efficiency Manitoba Plan: Under the Income Qualified Offers, Efficiency Manitoba will target landlord/tenants through the following initiatives:

- Additional outreach channels, such as property management, landlord associations, and tenancy branches in addition to the traditional paid media advertising.
- Work with non-profit social housing providers, who provide low-cost housing for lower income individuals. The program will target these social housing providers through trade shows, conferences, information sessions, and direct outreach activities.
- Work with community groups and partner with Neighbourhood Renewal Corporations. This includes enlisting an energy advocate in the targeted communities to act as a champion of Income Qualified offers. The energy advocate will be part of grassroots initiatives such as door-to-door canvassing and geo-targeted blitzes on a block-by-block basis. Homes located in the pre-selected, geo-targeted neighbourhoods with a higher prevalence of lower income customers can bypass the income qualification process and will be automatically approved to receive a free Home Energy Check-Up. Furthermore, the energy advocate's duties will include attending various seminars and meetings hosted by housing and tenancy branches within the community organizations to enlist their support, build relationships, and reach potential lower income customers.
- Educating community groups, senior's organizations, newcomer groups and resource centres with program materials, meetings and presentations on the program and energy efficiency tips. Presentations can be modified for their client's needs (such as plain language or use of a translator to remove language barriers).
- Customers residing in multi-unit residential buildings will be reached directly under traditional marketing initiatives, neighbourhood or social housing organizations, or their dedicated housing/rental tenancy branches.
- Alternative documentation from an approved list, including Employment and Income Assistance statements, are accepted by the program as income verification. This option is available to help minimize barriers to participation.

Additionally, under the Indigenous Programs, Efficiency Manitoba will coordinate efforts with, but not limited to: First Nation Tribal Councils; Southern Chief's

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Organization (SCO); Manitoba Keewatinowi Okimakanak (MKO); Assembly of Manitoba Chiefs (AMC); Manitoba Metis Federation; Natural Resources Canada; and Canada Mortgage and Housing Corporation to offer energy efficiency initiatives and leverage other programs or services which may complement proposed energy efficiency initiatives.

REFERENCE:

Efficiency Manitoba 2020/2023 Efficiency Plan Submission Pdf page 335 of 591

PREAMBLE TO IR (IF ANY):

At Pdf page 335 of the Plan, Efficiency Manitoba states:

103 Within the overall Manitoba Indigenous customer segment, there are 63 First Nations
104 in Manitoba, with approximately 15,500 homes/houses and 2,310 businesses or
105 commercial buildings

At Pdf page 334 of the Plan, Efficiency Manitoba states:

101 As of 2016, the most recently completed census, 18 percent of Manitoba's population
102 identified as Indigenous with the majority identifying as First Nation and or Metis.

And TABLE A6.2 on the same page sets out INSULATION & DIRECT INSTALL OFFER ENERGY &
GREENHOUSE GAS EMISSIONS SAVINGS SUMMARY including the following:

2020/21 2021/22 2022/23

No. of houses 100 150 180

QUESTION:

- a) Please confirm that the number of houses Efficiency Manitoba estimates will benefit from the insulation and direct install offer under the Indigenous customer segment for the three years of the plan is only 100, 150 and 180 respectively out of 15,500 houses.
- b) If confirmed, please provide a detailed explanation of the reason why these numbers are expected to be so low, including Efficiency Manitoba's understanding of the barriers to uptake for this program, and how Efficiency Manitoba intends to address these barriers.

RATIONALE FOR QUESTION:

To consider Efficiency Manitoba's estimates and to consider whether Efficiency Manitoba has a plan to address the barriers to uptake of a potentially beneficial DSM program.

RESPONSE:

- a) Confirmed. Efficiency Manitoba has estimated that 100, 150, and 180 houses will benefit from insulation and direct installs in the first three years of the Plan.

- b) In order to estimate the market, Efficiency Manitoba looked at historical participation and data from similar programs previously offered through Manitoba Hydro. As of the 2019/20 Demand Side Management Plan, Manitoba Hydro had estimated that only 152 (3.8%) of homes that required insulation upgrades were remaining to be completed. Efficiency Manitoba used this as a reference point to forecast participation. As Efficiency Manitoba works with First Nation communities, projected participation numbers may increase as better information is available.

REFERENCE:

Efficiency Manitoba 2020/2023 Efficiency Plan Submission Pdf page 338 of 591

PREAMBLE TO IR (IF ANY):

At Pdf page 338 of the Plan, Efficiency Manitoba states:

145 In order to maximize incentive dollars, Efficiency Manitoba will work with the Federal
146 government to leverage federal funding where ever possible. Doing so, will help
147 ensure the costs to First Nations to participate will be minimal, as the cost of
148 technologies and local First Nation labour to execute the installs will be provided
149 through an incentive from Efficiency Manitoba or a potential cost sharing model.

QUESTION:

- a) Has Efficiency Manitoba already engaged the federal government in discussions regarding potential cost sharing models or leveraging federal funding with respect to Efficiency Manitoba's First Nation Insulation and Direct Install Program?
- b) If so, please explain whether those discussions have included representatives from MKO member First Nations. Why or why not?

RATIONALE FOR QUESTION:

To understand whether Efficiency Manitoba is appropriately engaging with customers who may be directly affected by discussions Efficiency Manitoba may be having "on their behalf".

RESPONSE:

- a) Efficiency Manitoba has not engaged with the federal government in discussions regarding potential cost sharing models with respect to Efficiency Manitoba's First Nation Insulation and Direct Install Program. Efficiency Manitoba is aware that there may be opportunities to leverage federal programs and the need for First Nation

representation when discussing programming on their behalf with the federal government.

b) Not applicable as per response to MKO/EM I-36a.

October 25, 2019

122 government to collectively and cost-effectively address energy use and assist with
123 the reduction of fossil fuel use in the communities.

METIS CITIZENS

124 *“Métis” means a person who self-identifies as Métis, is of historic Métis*
125 *Nation Ancestry, is distinct from other Aboriginal Peoples and is*
126 *accepted by the Métis Nation.³*

127 Efficiency Manitoba recognizes the opportunity to reach this underserved market by
128 working closely with the MMF. Efficiency Manitoba aims to collaborate with the MMF
129 to establish a customer overview to gain better insight into the number of Metis
130 households and businesses in Manitoba with the goal to increase energy efficiency
131 program participation by Metis customers.

A6.2 INSULATION & DIRECT INSTALL OFFER

TABLE A6.2 INSULATION & DIRECT INSTALL OFFER ENERGY & GREENHOUSE GAS EMISSIONS SAVINGS SUMMARY

	2020/21	2021/22	2022/23
No. of houses	100	150	180
Annual electric savings (GWh) (at generation)	0.15	0.30	0.34
Annual capacity savings (MW) (at generation)	0.06	0.13	0.14
Annual natural gas savings (million m ³)	-	-	-
Annual GHG emission reductions (tonnes CO ₂ eq)	-	-	-

Note. Refer to Attachment 3 – Technical Tables for additional program details.

REFERENCE:

15 (PDF 140)

18 (PDF 221)

PREAMBLE TO IR (IF ANY):

Section 5 (page 15) states:

“For the purposes of determining the LRI for the natural gas portfolio, the costs associated with the Furnace Replacement Program (FRP) were excluded from the overall levelized PACT cost. This separate component was removed as those budgeted costs have already been collected from natural gas customers”. (emphasis added)

QUESTION:

- a) While the referenced portion of Section 5 is discussing the calculation of rate impacts the quote states that the costs associated with the Furnace Replacement Program (FRP) were excluded from the overall levelized PACT cost. Please clarify whether the costs associated with the FRP excluded from the calculation of the PACT.
 - I. If yes, why?
 - II. If not, for which natural gas program bundles (if any) were the FRP costs included?
- b) Were the programming costs associated with the use of the Affordable Energy Fund excluded from the calculation of the PACT for natural gas?
 - I. If yes, why?
 - II. If not, for which natural gas program bundles (if any) were they included.

RATIONALE FOR QUESTION:

To understand the costs included in the Natural Gas PACT calculations.

RESPONSE:

- a) The Furnace Replacement Program (FRP) costs were included as costs in the PACT cost-effectiveness assessment in the Plan. The FRP costs were only excluded from the PACT costs for the lifecycle revenue impact (LRI) assessment to reflect that these costs have already been collected from natural gas customers. To include these costs in the LRI analysis would result in an overstatement of the natural gas revenue required and the resulting one-time change in rates.
- i. See part a) above.
 - ii. The FRP costs have been included in the Income Qualified Offers and Metis Income Qualified Offers natural gas program bundles.
- b) As prescribed in Section 14 of the Efficiency Manitoba Regulation, Efficiency Manitoba must only use the Affordable Energy Fund (AEF) to encourage conservation in the use of home heating fuels other than electrical energy or natural gas. The Plan does not specifically include any AEF funding or forecasts for conservation in the use of these other home heating fuels given the limited market information regarding homes with fuel oil and propane heat combined with the historically low activity for retrofits to these homes as experienced with previous conservation programs. Heating and insulation contractors are aware of the eligibility of these homes and Efficiency Manitoba will fund any initiatives that reduce the consumption of these other fuels as the opportunities arise and track the costs to the Affordable Energy Fund and the savings on an equivalent gigajoule basis to natural gas savings. The only exception to the lack of market data regarding home heating sources other than natural gas and electricity is in diesel communities where Efficiency Manitoba is aware that nearly 100 percent of the homes are heated with fuel oil. As per the response to PUB/EM I-48, Efficiency Manitoba will confirm opportunities remaining with the communities as historic participation data from Manitoba Hydro has indicated that most homes have been retrofitted with insulation upgrades. Efficiency Manitoba also anticipates other opportunities with respect to fuel oil furnaces and will work with the diesel communities to identify what they are how they can best be supported within the constructs of the Efficiency Manitoba Act and Regulation including the use of the Affordable Energy Fund.
- i. Not applicable.
 - ii. Not applicable.

REFERENCE:

The Efficiency Manitoba Act Section 7(c)

PREAMBLE TO IR (IF ANY):

The Efficiency Manitoba Act, Section 7(c) mentions that Efficiency Manitoba may develop and implement programs to improve building designs, building techniques and building technologies to increase energy efficiency.

QUESTION:

- a) Please describe whether Efficiency Manitoba plans to develop and implement programs to improve building designs, building techniques and building technologies to increase energy efficiency of buildings on First Nation reserves, including those in northern Manitoba.
- b) Why or why not?

RATIONALE FOR QUESTION:

Comparing the Efficiency Manitoba Act with the proposed Plan.

RESPONSE:

- a) Efficiency Manitoba's New Homes Program will work with First Nations communities to support their efforts of building better homes with improved building design, building techniques, and building technologies to ensure homes are built energy efficient at the start. In addition, Efficiency Manitoba has had preliminary conversations with the Manitoba Indigenous Housing Capacity Enhancement and Mobilization Initiative (MIHCEMI) Working Group to support their objective of creating a First Nations Building Code. This working group has representation from all 63 First Nations, including Northern Manitoba First Nations, and the Tribal Councils.
- b) Efficiency Manitoba wants to support First Nations communities in their efforts to be energy efficient and have improved building design, building techniques and building

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technologies that are decided upon by First Nations. There is value in having a building code created for First Nations by First Nations, which can take traditional way of life into consideration as well as the northern climate.

ELECTRIC & NATURAL GAS PORTFOLIO SUMMARY - COMPOSITION OF ANNUAL ENERGY SAVINGS & BUDGET BY CUSTOMER SEGMENT

	Customer Segment					
	Industrial	Agricultural	Commercial	Residential	Income Qualified	Indigenous
Annual Average	Electric Portfolio					
Energy Savings (%)	39%	3%	35%	22%	1%	0.5%
Budget (%)	20%	4%	36%	19%	3%	3%
Annual Average	Natural Gas Portfolio					
Energy Savings (%)	29%	1%	25%	37%	7%	0.3%
Budget (%)	9%	1%	27%	21%	30%	2%

Note. Programming budget values do not include cost components associated with Enabling Strategies and Corporate Overhead.

6.3 THE PLAN PROVIDES SIGNIFICANT SOCIAL, ECONOMIC & ENVIRONMENTAL BENEFITS TO MANITOBANS

230 The energy efficiency programming, technologies, and incentives packaged within the
 231 Plan all provide additional benefits to Manitobans beyond direct electric and natural
 232 gas energy and cost savings. These “non-energy” supplemental benefits do not
 233 appear in the cost-effectiveness tests, bill or rate impacts. These additional unique
 234 benefits add to the overall social, economic, and environmental value of Efficiency
 235 Manitoba and include, but certainly are not limited to:

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Energy Savings (%)	29%	1%	25%	37%	7%	0.3%
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 231 Plan all provide additional benefits to Manitobans beyond direct electric and natural
 232 gas energy and cost savings. These “non-energy” supplemental benefits do not
 233 appear in the cost-effectiveness tests, bill or rate impacts. These additional unique
 234 benefits add to the overall social, economic, and environmental value of Efficiency
 235 Manitoba and include, but certainly are not limited to:

TABLE A6.1 INDIGENOUS CUSTOMER SEGMENT OFFER SUMMARY

PROGRAM	MEASURES	STATUS	DELIVERY
INSULATION AND DIRECT INSTALL OFFERS	<p>Home energy efficiency upgrades:</p> <ul style="list-style-type: none"> • Insulation • Direct install measures • Smart thermostats • ENERGY STAR® certified clothes washers 	Existing program with enhancements	Participating First Nations (installation)
SMALL BUSINESS OFFERS	<p>Product rebates:</p> <ul style="list-style-type: none"> • Aerators and showerheads • Lighting • Smart / programmable thermostats 	New offer	Contracted third-party (supply, installation)
COMMUNITY GEOTHERMAL	<p>Geothermal heat pumps</p>	Existing program with enhancements	Indigenous social enterprise (coordination), First nation (installation)
METIS INCOME QUALIFIED	<p>Home energy efficiency upgrades:</p> <ul style="list-style-type: none"> • Insulation • Natural gas furnace • Direct install measures • Smart thermostats • ENERGY STAR certified clothes washers 	New offer	Contracted third-party (installation)

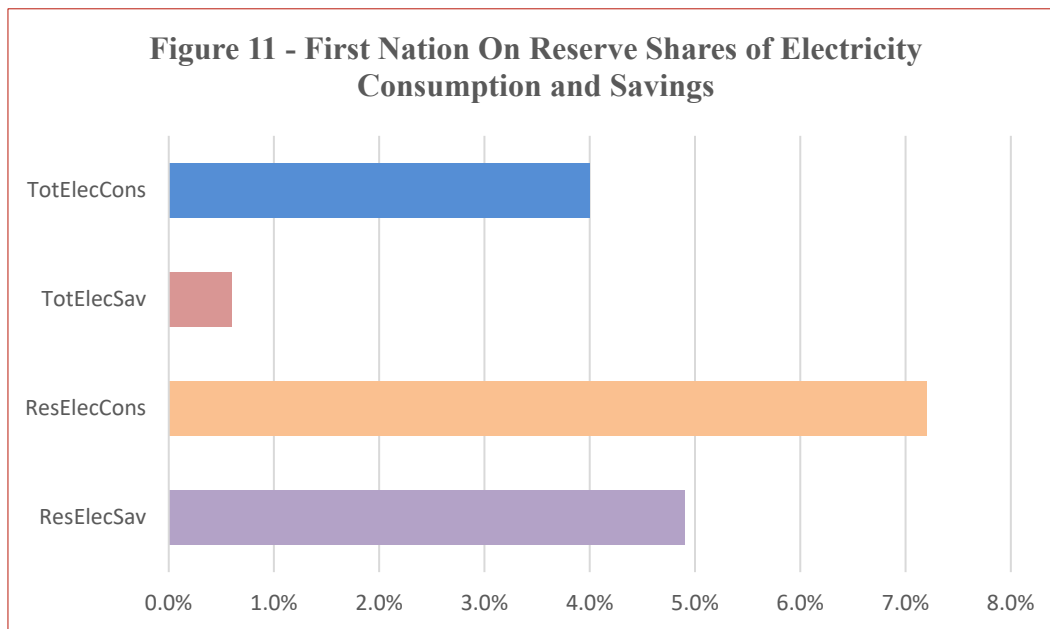
A6.1 CUSTOMER SEGMENT DESCRIPTION

101 As of 2016, the most recently completed census, 18 percent of Manitoba’s population
 102 identified as Indigenous with the majority identifying as First Nation and or Metis¹.

¹ <https://www12.statcan.gc.ca/census-recensement/2016/as-sa/fogs-spg/Facts-PR-Eng.cfm?TOPIC=9&LANG=Eng&GK=PR&GC=46>



This review suggests that the Plan



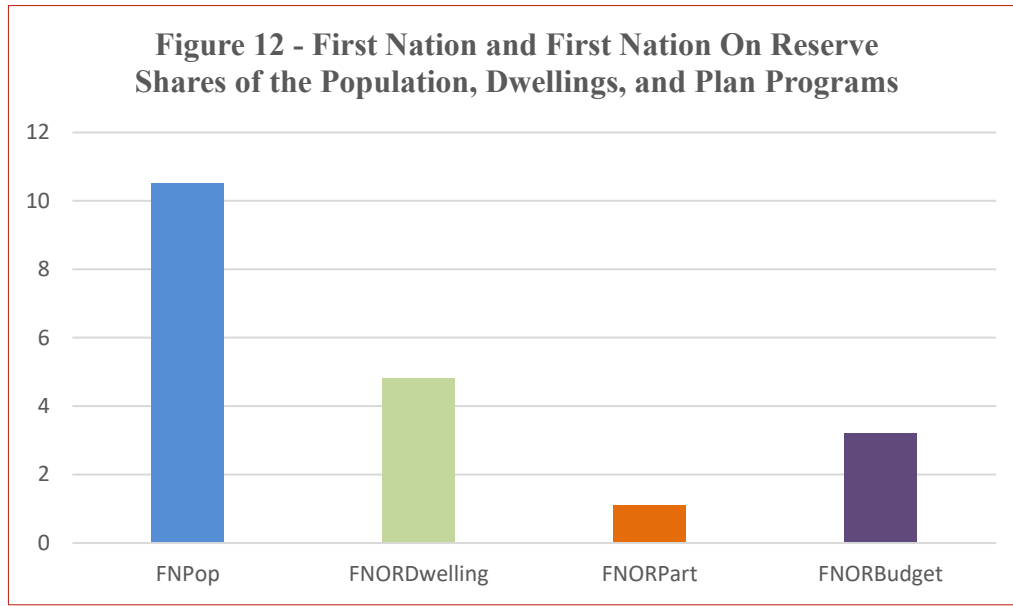
Sources: 2017 REUS, p. 166; Coalition/EM I-18a; Daymark/EM I-95a; the Plan, Attachment 3.

The evidence presented here suggests that Indigenous residential programs for on reserve First Nations do not match the First Nation On Reserve share of existing customers and electricity consumption. Given the dramatically higher rates of energy poverty faced by First Nations on reserve, moreover, there is a case to be made that the relative shares should be higher in order to address this inequality.

There is, however, another issue that is not captured by the discussion of programs for on reserve First Nations: the off-reserve First Nation population. One of the challenges in conducting an assessment of the Plan on First Nations is that there is very little energy information on the off-reserve First Nation population, both in terms of the number of customers, average energy consumption, and energy bills and poverty, as well as their relative participation in energy



efficiency programs. We do not know, therefore, how many off reserve First Nation hydro customers there are or their rates of participation in energy efficiency programs.



Sources: Census of Canada 2016; 2017 REUS, p. 166; the Plan, Attachment 3.

Figure 12 compares the First Nation share of the population and the share of First Nation On Reserve dwellings according to the 2017 REUS (adjusted for household size), the share of First Nation On Reserve programs (direct install and community geothermal) in the number of estimated participants for residential programs, and the share of the First Nation On Reserve residential programs in the budget for residential programs. According to the 2016 Census of Canada, the First Nation population in Manitoba is 10.5% of the total population (unfortunately data on the number of off-reserve First Nation households is not publicly available). Of this population, 52% live off-reserve. While an important segment of the LICO-125 population consists of First Nation customers and households, both on and off reserve, there is no data of which we are aware that

EFFICIENCY MANITOBA 2020-2023 EFFICIENCY PLAN**PUB INFORMATION REQUESTS OF AMC****DECEMBER 13, 2019**

non-reserve Indigenous populations. These kinds of barriers could be addressed by an off-reserve First Nation program.

c) There is a lack of evidence related to energy efficiency programs specifically upon which one could make such recommendations. However, this lack of evidence did not stop EM from developing a Metis Income Qualified Program. Moreover, evidence from other sections suggests that there are several elements that could be considered, including programs that are run out of urban, First Nation organizations, programs that are staffed by First Nation individuals, culturally appropriate marketing and outreach efforts that focus on places where off-reserve First Nation hydro customers can be reached, to name just a few examples. Ultimately, however, the design and implementation of any such program is best left to discussions and negotiations between EM and Indigenous governments and organizations.

PUB/AMC - 4 Reference: WSSS evidence p.38 of 57

Preamble:

According to the 2017 REUS Table 1.01, there are 15,456 residential on-reserve dwellings, compared with 158,967 income-qualified dwellings (based on Winnipeg LICO-125) and 484,811 total dwellings.

Request:

- a) Explain how WSSS derived the percentage of First Nations on-reserve customers of 4%.
- b) WSSS notes that First Nations programs only account for 0.6% of electric savings. Is it WSSS's view that First Nations program savings should be proportional to the number of First Nations on-reserve customers, ignoring the higher consumption of commercial and industrial customers? Is the proportion of on-reserve savings to the

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total residential savings and comparison to the proportion of on-reserve dwellings to total residential dwellings a better gauge of equity?

- c) What percentage of the overall EM budget should be spent on First Nations on-reserve efficiency programs? Should this percentage be based on the proportion of First Nations customers to total residential customers or total customers? If not, what is the basis for the recommended percentage of the budget?

Response:

a) The figure comes from Coalition/EM I-18a.

b) The 4% figure referred to the First Nation On Reserve share of electric customer and electricity consumption. The appropriate units of comparison are between share of electricity consumption and share of electricity savings. However, the section cited did lack adequate conceptual clarity between units of analysis. The section titled “Assessment of Potential Impacts to First Nations” has been revised and resubmitted to the Board to more clearly separate out units of analysis. Please see Page 38 of the revised report for the revised figures and discussion.

c) The test of horizontal equity would require that the shares be at least proportionate in terms of the share of customers/participants (both total and residential) and electricity consumption/savings. The budget allocation would be the allocation required to meet those standards. The test of vertical equity, on the other hand, would suggest that the First Nation share of participants and electricity savings should be greater than the share of customers and electricity consumption.

PUB/AMC - 5 Reference: WSSS evidence pp.36-39; PUB/EM-8 (Residential Energy Use Survey)

Preamble:

On page 36, as well as Figures 10 through 12, WSSS suggests that the First Nation population makes up roughly 10% of the population of Manitoba. The same references

REFERENCE:

Efficiency Manitoba 2020/2023 Efficiency Plan Submission Pdf pages 79, 80 and 84-85 of 591

PREAMBLE TO IR (IF ANY):

At pdf page 79 of the Plan, Efficiency Manitoba states that:

47 Efficiency Manitoba has targeted residential, residential income qualified, Indigenous,
48 and commercial, industrial and agricultural customer segments. Separating income
49 qualified and Indigenous customers as overall distinct segments emphasizes the
50 strategic importance and unique characteristics of these customers

At pdf page 80 of the Plan, Efficiency Manitoba states that:

70 Efficiency Manitoba has identified the need to reach a larger Indigenous
71 market. This segment may have similarities to other residential or hard-to
72 reach customers, but, in the case of First Nations specifically, an additional
73 layer of complexity can exist due to geography, homeownership structure,
74 and availability of resources.

At pdf pages 84-85 of the Plan, Efficiency Manitoba includes Table 3.3 which provides a
summary of the programs, initiatives, and offers in the residential sector, and states that:

149 These offers are designed to increase awareness of energy-efficient
150 technologies and practices and provide customers with rebates, incentives, and
151 information to encourage them to make their homes more energy efficient.

QUESTION:

- a) Please explain whether the full suite of programs, initiatives and offers in the residential sector, including product rebate offers, home renovation offers, new homes and major renovation offers, home energy efficiency kits and education are available to First

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Nations Residential On-Reserve customers, including those customers in northern First Nations, which includes those in the Diesel Zone. Why or why not?

- b) If not, please explain the rationale behind making available less, rather than more DSM programs to this hard to reach customer group?
- c) Please explain whether the offers to the Indigenous customer segment are designed to increase awareness of energy-efficient technologies and practices and provide customers with rebates, incentives, and information to encourage them to make their homes more energy efficient. If not, why not? And if not, what are the offers to the Indigenous customer segment designed to do?

RATIONALE FOR QUESTION:

To understand whether the programs available to residential customers are available to residential First Nations customers, and if not whether such an approach complies with the Act and Regulations.

RESPONSE:

- a) **First Nations Residential On-Reserve customers, including those in northern First Nations and those in the Diesel Zone are welcome to access the full suite of residential programs. Some initiatives will have a separate, specific First Nations approach, such as the education initiative, and Efficiency Manitoba would like to work with MKO and AMC, along with other potential Indigenous partners, to establish energy efficiency education pieces that are culturally relevant.**
- b) Not applicable as per response to MKO/EM I-7a.
- c) As outlined in the Plan on page 331 of 591, Efficiency Manitoba aims to establish an Indigenous education initiative designed to increase awareness of energy-efficient technologies and practices.

REFERENCE:

Plan Application – Page 229 of 591

PREAMBLE TO IR (IF ANY):

This section states that the Plan considers factors beyond quantified electric and natural gas savings, and lists program non-energy benefits.

QUESTION:

Please provide responses to the following:

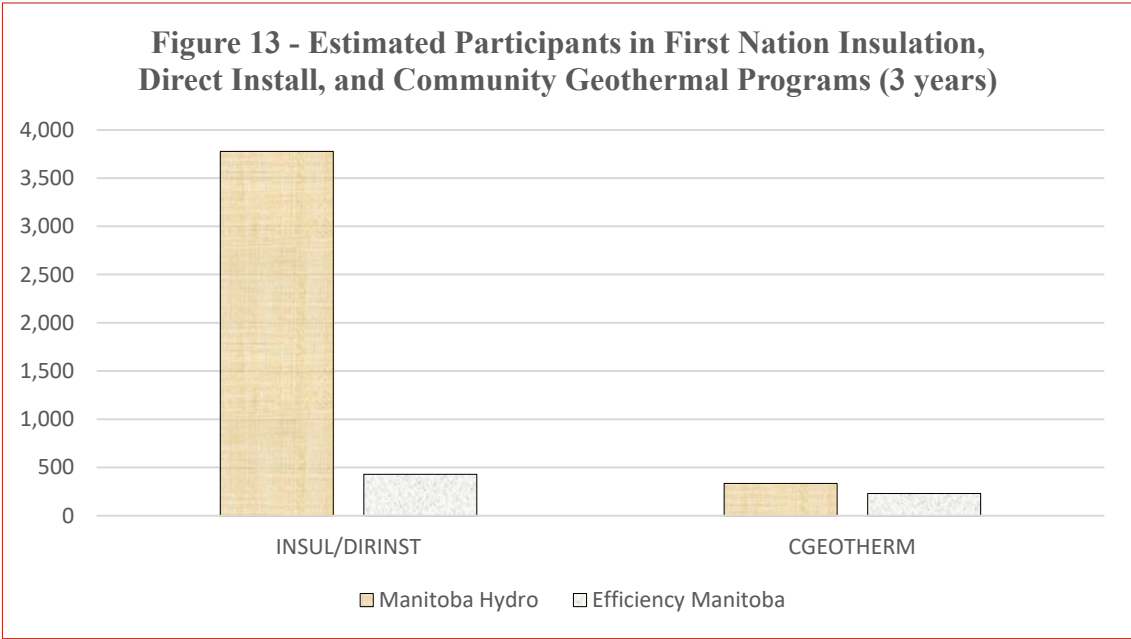
- a) How did EM determine what non-energy benefits to consider? Please provide the documents consulted to make these determinations.
- b) Has EM quantified any non-energy benefits as part of its program selection and evaluation processes? If so, which ones and explain how benefits were quantified?
- c) Explain why quantitative factors such as distributional equity and reductions in energy poverty, and non-quantitative factors such as energy security for First Nations were not included in the list of non-energy benefits?
- d) Describe how, if at all, non-energy benefits are integrated into the Impact Evaluation and Cost-Effectiveness Analyses?
- e) Will EM commit to working with AMC to discuss a more visible and meaningful integration of non-energy benefits into the selection of programs, the allocation of budgets, and the evaluation of programs?

RATIONALE FOR QUESTION:

AMC seeks greater clarity on the factors considered in the selection of programs, the allocation of budgets, and the evaluation of programs. AMC is concerned that the criteria used biases current and future programs excessively towards the most cost-effective programs at the expense of more expensive options, even when those options can achieve more significant per capita decreases in energy consumption and can have more meaningful impacts for energy poor First Nation customers and reduce inequality.

RESPONSE:

- a) When screening measures and programs, Efficiency Manitoba included those non-energy benefits that were quantifiable.
- b) Currently, reduced greenhouse gas emissions and reduced water consumption are the only non-energy benefits quantified and included in the program selection and evaluation.
- c) Even though these factors would not enter into a PACT test, Efficiency Manitoba welcomes the opportunity to discuss with AMC any current data they may have on how energy efficiency leads to distributional equity and reductions in energy poverty, and non-quantitative factors such as energy security for First Nations.
- d) The value of non-energy benefits is only included as an additional benefit in the Total Resource Cost (TRC) test. As per the Efficiency Manitoba Regulation 119/2019 Section 12 (1) and (2), the cost-effectiveness of Efficiency Manitoba's portfolio will be measured by the Program Administrator Cost Test (PACT) which, by definition, does not include any non-energy benefits.
- e) Yes. Efficiency Manitoba welcomes the opportunity to work with AMC to discuss alternative non-energy benefits for consideration into program design and evaluation.



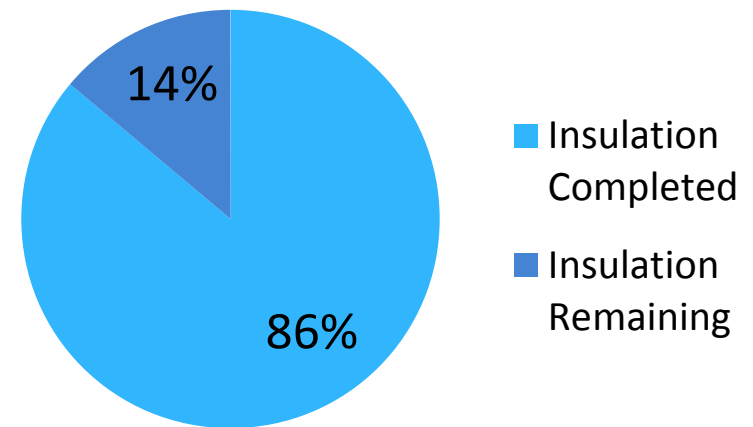
The decline in the number participants is less marked but nevertheless significant for the Community Geothermal Program. From an estimated 335 participants in the final three years of the Manitoba Hydro’s Community Geothermal Program, there is a more than 30% drop in the Plan to an estimated 230 participants.

As the estimated number of participants has declined, so have the budgetary allocations. Figure 14 presents the data provided by EM on the budgets for Manitoba Hydro and EM Insulation, Direct Install, and Community Geothermal Programs for the three most recent and upcoming years.

Indigenous Power Smart Program - Insulation

- All Communities contacted
- 40 Communities completed
- Estimated market based on Residential Energy Use Survey and discussions with Band Housing Managers
 - If there are more homes found which qualify they are upgraded
- Up to December 2014, 1,457 homes also received basic energy efficiency measures

Indigenous Insulation Market



Total Estimated Market	3,778
Completed	3,254

Indigenous Power Smart Program

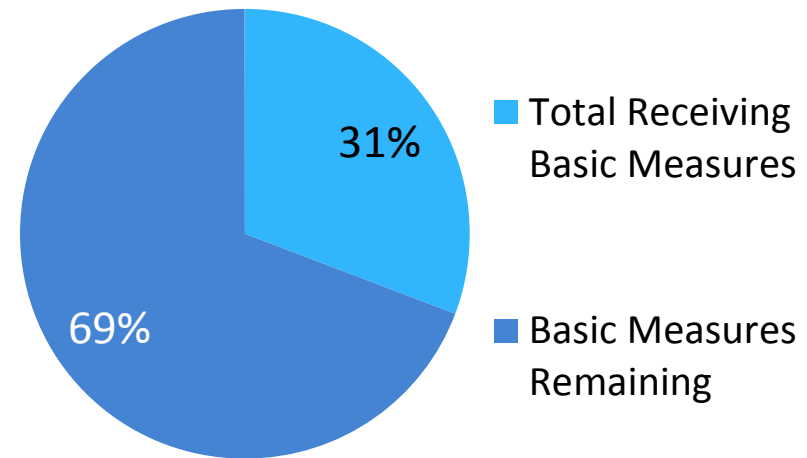
- **Indigenous Direct Install Initiative**

- Proactively launched December 2014
- LEDs, Showerheads, Faucet Aerators, Pipe Wrap, Window Kits & Draft Stoppers
- Pay local labour to directly install measures
- 3,574 Homes Retrofitted

- All Communities contacted

- 12 Communities completed

Basic Measures Market



Total Estimated Market	16,344
Completed	5,031

MKO Communities

- **Insulation Efforts**

- 1,320 Completed Homes of Estimated 1,468 (90%)
- 20 Communities Insulation Complete
- 6 Communities Insulation Underway, 148 Homes
- 1 Community No Insulation Needed

- **Direct Install Efforts**

- 1,790 Completed Homes* of Estimated 7,375 (24%)
- 3 Communities Direct Install Complete (LEDs, Showerheads, Faucet Aerators, Pipe Wrap, Window Kits & Draft Stoppers)
- 24 Communities With Measures Underway
- Pace determined by each community

*Some homes received basic measures with their insulation prior to December 2014

REFERENCE:

Efficiency Manitoba 2020/2023 Efficiency Plan Submission Pdf page 338 of 591

PREAMBLE TO IR (IF ANY):

At Pdf page 338 of the Plan, Efficiency Manitoba states:

145 In order to maximize incentive dollars, Efficiency Manitoba will work with the Federal
146 government to leverage federal funding where ever possible. Doing so, will help
147 ensure the costs to First Nations to participate will be minimal, as the cost of
148 technologies and local First Nation labour to execute the installs will be provided
149 through an incentive from Efficiency Manitoba or a potential cost sharing model.

QUESTION:

- a) Has Efficiency Manitoba already engaged the federal government in discussions regarding potential cost sharing models or leveraging federal funding with respect to Efficiency Manitoba's First Nation Insulation and Direct Install Program?
- b) If so, please explain whether those discussions have included representatives from MKO member First Nations. Why or why not?

RATIONALE FOR QUESTION:

To understand whether Efficiency Manitoba is appropriately engaging with customers who may be directly affected by discussions Efficiency Manitoba may be having "on their behalf".

RESPONSE:

- a) Efficiency Manitoba has not engaged with the federal government in discussions regarding potential cost sharing models with respect to Efficiency Manitoba's First Nation Insulation and Direct Install Program. Efficiency Manitoba is aware that there may be opportunities to leverage federal programs and the need for First Nation

representation when discussing programming on their behalf with the federal government.

b) Not applicable as per response to MKO/EM I-36a.

REFERENCE:

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PREAMBLE TO IR (IF ANY):

EM states that if additional sources of funding become available these amounts will reduce the amount of funding provided by Hydro Manitoba and Centra Gas for the Plan.

QUESTION:

If Efficiency Manitoba receives funding from the federal government or Indigenous Services Canada as anticipated in certain programming under the Indigenous program bundle, will that funding also be used to offset the funding provided by Hydro Manitoba and Centra Gas for Indigenous programming?

RATIONALE FOR QUESTION:

The AMC wants to understand what assumptions have been made by EM about federal contributions to energy efficiency programs for First Nations, and what impact the assumptions will have on programming.

RESPONSE:

Efficiency Manitoba has not incorporated assumptions about federal contributions to energy efficiency programs for First Nations, including with limitation from Indigenous Services Canada, in the design of Indigenous programming within the Plan.

SURVEY METHODOLOGY

The main survey design objectives and procedures taken to implement the 2017 Residential Energy Use Survey are presented in the following sections.

2.01 Sample Design Objectives

The main objective of the sample design was to ensure a sufficient number of completed surveys were returned for analysis of key categories such as dwelling type, fuel area location, and heating fuel source.

2.02 Sample Selection

As of November 1, 2017, there were a total of 484,811 premises under the residential rate class. From this group, 15,375 surveys were mailed to residential customers residing on First Nation reserve land in order to increase the representation of this customer segment within the analysis. 19,997 surveys were mailed to residential customers not residing on First Nation reserve land and were selected using a random generation process. Survey packages were mailed in November 2017 and included the 20-page questionnaire booklet and a stamped self-addressed return envelope. No incentive was given to complete the survey and no attempt was made to contact non-respondents.

The 484,811 dwellings correspond to 487,378 total Residential billing customers that existed during that month. The difference of 2,567 is due to dwellings with two or more Residential services.

2.03 Survey Returns

In total 35,372 residential customers were reached and 4,320 surveys were completed and returned. A survey response rate of 12.3% was achieved. The overall survey results are accurate within 1.48%, 19 times out of 20.

Of the 19,997 residential customers reached who were not residing on First Nation reserve land, 3,799 surveys were completed and returned. A survey response rate of 19.1% was achieved. The overall survey results are accurate within 1.58%, 19 times out of 20.

Of the 15,375 residential customers reached who were residing on First Nation reserve land, 521 surveys were completed and returned. A survey response rate of 3.4% was achieved. The overall survey results are accurate within 4.23%, 19 times out of 20.

8

REFERENCE:

Section 3.2.3 Programming, pdf page 83 of 591.

PREAMBLE TO IR (IF ANY):

Section 3.2.3 states that both electric and natural gas programming in the Plan have been organized into program bundles which was one of the opportunities in the category of “enhanced marketing efforts” identified in the Manitoba Hydro DSM optimization report. Instead of offering separate and independent energy conservation programs and initiatives, Efficiency Manitoba has organized programs and initiatives by shared features and grouped these together under comparable delivery models.

QUESTION:

Please explain:

- a) Please explain which contributes more to the reason for placing programs in a program bundle: shared features or comparable delivery models?
- b) Please identify and describe the delivery models used for grouping programs into bundles.
- c) Please identify the shared features used to group programs into bundles.

RATIONALE FOR QUESTION:

Understand how program savings targets will be achieved.

RESPONSE:

- a) The development of program bundles as presented in the 2020/23 Efficiency Plan (“Plan”), resulted pursuant to Efficiency Manitoba taking into account numerous considerations, including but not limited to:
 - i. shared features such as similar technologies or technologies within the same industry trade;

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- ii. comparable delivery models;
- iii. consolidation of opportunities across program bundles for select hard-to-reach customer groups including income qualified, Indigenous, and small business;
- iv. considerations related to cost-effectively servicing all customer segments through an inclusive and diverse portfolio;
- v. objectives related to identifying innovative approaches to better serve Manitobans while achieving the mandated energy savings; and
- vi. objectives related to building and sustaining meaningful partnerships.

Additional considerations, in part leading to the development of program bundles as presented in the 2020/23 Efficiency Plan, can be viewed in PUB-EM 2b - Attachment 1 – memos produced for Efficiency Manitoba by Dunsky Energy Consultants in 2018. One memo provided to Efficiency Manitoba titled “Efficiency Manitoba Program ‘Bundling’ Memo”, dated June, 28th, 2018 outlines the following benefits of program bundling:

BENEFITS OF PROGRAM BUNDLING***1. Simplifying Marketing & Communications***

Simplicity is a friend when it comes to product promotion. Having a smaller number of uniform packages can help program administrators establish a recognizable brand, and ultimately enhance marketing efforts. Similarly, trade allies such as windows distributors can be more easily led to cross promote broader savings opportunities (e.g. home retrofit) rather than simply focusing on the benefits of their single measure.

2. Streamlining Internal Processes

A large number of programs can create needless administrative burden, as internal processes for each program evolve in different ways over time. They also increase the risks associated with managing multiple silos, which include suboptimal program designs and inconsistent methods applied across the portfolio (e.g. are measures in one program treated the same way as measures in another program?).

3. Decision Making

Too much choice can become a barrier to action. Presenting potential participants with a large number of opportunities that they then have to match with a long list of programs can be daunting, and customers may not have the time or expertise to navigate the decision-making process. Reducing complexity can increase participation and customer satisfaction.

Efficiency Manitoba did not complete a quantitative analysis to model or isolate the relative weighting of the considerations and benefits that led to the creation of program bundles.

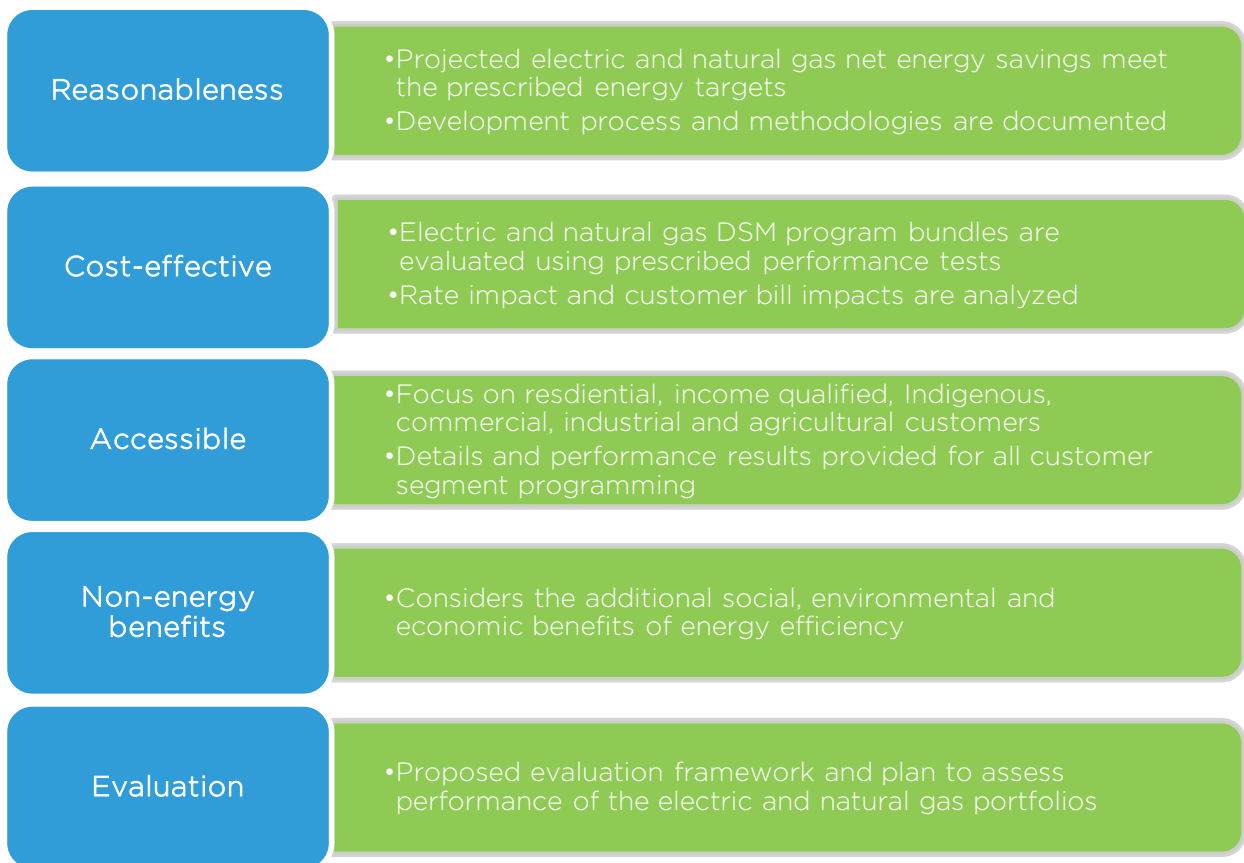
- b) The delivery models associated with the various program bundles are shown in the far-right column of the provided table below. Utilizing the delivery model as a criteria to consider when creating program bundles will serve to simplify marketing and communications; streamline internal processes; and ease and accelerate customer decision making.

Residential

BUNDLES	MEASURES	NEW OR CONTINUING OFFER	DELIVERY
DIRECT INSTALL OFFERS	Online Home Energy Questionnaire	New Efficiency Manitoba offer	Online
	Home Energy Check-Up	New Efficiency Manitoba offer	Contracted third-party
	Free basic energy-efficient upgrades: <ul style="list-style-type: none"> Up to two energy-efficient showerheads (5.7 LPM) Up to two energy-efficient bathroom aerators (5.7 LPM) Up to five LED bulbs Tier 2 advanced power strips *NEW Window insulating kits *NEW Weatherstripping *NEW Outdoor car plug timers *NEW 	Manitoba Hydro program with enhancements	Contracted third-party (supply and installation)
	Incentive-based energy-efficient upgrades: <ul style="list-style-type: none"> Heat recovery ventilator (HRV) controls Smart thermostats *NEW 	Manitoba Hydro program with enhancements	Contracted third-party (supply and installation)

2.3 THE PLAN CONTAINS THE REQUESTED ELEMENTS OF THE ACT & REGULATION

49 The Plan contains the necessary elements required for regulatory review specified
50 within the Act, Regulation and directions from government including the elements
51 provided in the following figure. The points of alignment highlighted in the following
52 figure serve as a solid foundation to the Plan which will ensure a continued, long-term
53 strategy to support energy efficiency in Manitoba.



OPPORTUNITY #4: ENHANCED MARKETING EFFORTS

OVERVIEW OF THE OPPORTUNITY

Notwithstanding the additional measures and sales capacity issues noted above, we find that Hydro’s current plans are comprehensive, in that they address the vast majority of *areas* of savings opportunity. That said, one consideration we have raised with Hydro is how the utility categorizes its programs. Currently, Hydro organizes its programs according to end-use category, which may be beneficial for a focus on market penetration and long-term estimation of opportunities. However, there are drawbacks:

- J **Marketing:** Hydro’s comprehensive set of programs is valuable when customers know what is being offered and whether or not they can obtain rebates on energy-efficient products. However, because Hydro’s incentives are generally offered for specific technology categories, there is a level of energy efficiency literacy required in order to understand many of the savings opportunities. We understand that trade allies may “sell” opportunities when installing furnaces and other equipment (though we are concerned about over-reliance on un-incented firms and tradespeople for this purpose); however, by focusing on these specific end-uses, Hydro may be missing out on opportunities to cross-promote other savings opportunities. To use the example above, by combining multiple building-envelope measures into one program, trade allies such as windows distributors can cross-promote an entire home retrofit program rather than simply focusing on the benefits of energy-efficient windows.

These drawbacks focus on the level of granularity at which Hydro conducts its analyses and administers its programs. By doing so, the utility may be missing out on additional savings opportunities, for example, by bundling measures or options together for greater savings (e.g. by providing a higher incentive if two or three measures are installed together). Specifically, we recommend that Hydro consider “rolling up” some of its programs to a higher level. In table 3 below, we provide an example of one potential way to categorize technologies into higher-level programs. **We note that it is not intended as a recommendation for a particular categorization.**

Table 8: Program category examples

Sector	Existing Program	Program Category Option
Residential	Home Insulation	Heating and Insulation
	Community Geothermal Program	
	Refrigerator Retirement Program	Efficient Products
	HRV Controls	
	Power Bars	
	Smart Thermostats	
	Plug-in Timers	Lighting
	Residential LED Lighting Program	
	Drain Water Heat Recovery	Water and Energy Saver
	Water & Energy Saver	
	Affordable Energy Program	Low Income

REFERENCE:

Efficiency Plan p. 37,38, 130-133, 231-233 of 591

PREAMBLE TO IR (IF ANY):**QUESTION:**

- a. Provide the total resource cost ratios, total resource cost net present values, levelized resource costs, simple customer paybacks, participating customer cost ratios, and participating customer cost net present values for each initiative in the Plan.
- b. File Efficiency Manitoba's analysis of the social, economic, or environmental benefits by DSM initiative or bundle.

RATIONALE FOR QUESTION:**RESPONSE:**

- a. Based on PUB, COALITION and MIPUG information requests, the following tables provide the electric portfolio cost effectiveness results for the program administrator cost test (PACT); total resource cost test (TRC); participating customer cost test (PC); simple customer payback; and rate impact measure (RIM) for each initiative in the Plan.

Please note that the electric portfolio PACT results have been revised for the Indigenous Small Business and commercial, industrial and agricultural Small Business & Appliances program bundles. The corrected values are highlighted.

Electric Program Cost-Effectiveness Metrics			PACT						
			PACT Benefit	PACT Costs	Ratio (A)	PACT NPV (000's \$)	LC Savings	Levelized Cost (cents/kWh) (B)	A * B (cents/kWh)
			2020/23 Efficiency Plan						
RESIDENTIAL PROGRAMS									
	Direct Install		\$2,482	\$1,622	1.53	\$861	39,071,794	4.15	6.35
	Product Rebates		\$17,776	\$10,242	1.74	\$7,533	293,339,658	3.49	6.06
	Home Renovation		\$22,428	\$7,723	2.90	\$14,705	210,642,446	3.67	10.65
	New Homes & Major Renovation		\$19,922	\$3,036	6.56	\$16,885	164,588,619	1.84	12.10
	Home Energy Efficiency Kits & Education		\$936	\$583	1.61	\$353	19,111,747	3.05	4.90
	Subtotal		\$63,544	\$23,206	2.74	\$40,338	726,754,266	3.19	8.74
INCOME QUALIFIED PROGRAMS									
	Income Qualified Offers		\$11,786	\$4,210	2.80	\$7,576	113,670,365	3.70	10.37
	Subtotal		\$11,786	\$4,210	2.80	\$7,576	113,670,365	3.70	10.37
INDIGENOUS PROGRAMS									
	Insulation and Direct Install		\$1,293	\$680	1.90	\$613	11,564,118	5.88	11.18
	Small Business		\$620	\$1,081	0.57	(\$461)	9,608,801	11.26	6.45
	Community Geothermal		\$5,075	\$1,259	4.03	\$3,816	44,013,674	2.86	11.53
	Metis Income Qualified		\$913	\$354	2.58	\$559	8,372,693	4.23	10.90
	Subtotal		\$7,901	\$3,373	2.34	\$4,527	73,559,287	4.59	10.74
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS									
	Small Business & Appliances		\$17,585	\$7,641	2.30	\$9,945	304,763,314	2.51	5.77
	In-Suite Efficiency		\$1,768	\$712	2.48	\$1,055	22,696,213	3.14	7.79
	Renovation		\$235,351	\$47,395	4.97	\$187,957	2,844,426,058	1.67	8.27
	HVAC & Controls		\$8,545	\$3,044	2.81	\$5,501	132,429,999	2.30	6.45
	New Construction & High-Performance Buildings		\$14,080	\$4,769	2.95	\$9,311	201,789,888	2.36	6.98
	Custom		\$46,008	\$8,875	5.18	\$37,133	757,347,189	1.17	6.07
	Load Displacement		\$84,119	\$22,597	3.72	\$61,521	1,506,392,254	1.50	5.58
	Subtotal		\$407,456	\$95,032	4.29	\$312,423	5,769,844,915	1.65	7.06
EMERGING TECHNOLOGY PROGRAMS									
	Emerging Technology		\$6,272	\$2,115	2.96	\$4,156	100,048,602	2.11	6.27
	Subtotal		\$6,272	\$2,115	2.96	\$4,156	100,048,602	2.11	6.27
Program Impact Totals			\$496,959	\$127,937	3.88	\$369,021	6,783,877,435	1.89	7.33
Program Support, Enabling Strategies & Corporate Overhead			\$0	\$23,883		(\$23,883)	-		
Overall Portfolio Metrics			\$496,959	\$151,821	3.27	\$345,138	6,783,877,435	2.24	7.33
<i>Note: May not add up due to rounding.</i>									



Electric Program Cost-Effectiveness Metrics		Total Resource Cost Tests				
		TRC Benefit	TRC Costs	TRC Ratio	TRC NPV (000's \$)	Levelized Cost (cents/kWh)
RESIDENTIAL PROGRAMS						
	Direct Install	\$4,355	\$2,183	1.99	\$2,171	5.59
	Product Rebates	\$25,053	\$20,274	1.24	\$4,778	6.91
	Home Renovation	\$23,232	\$12,075	1.92	\$11,157	5.73
	New Homes & Major Renovation	\$19,922	\$11,421	1.74	\$8,501	6.94
	Home Energy Efficiency Kits & Education	\$1,766	\$563	3.14	\$1,203	2.94
	Subtotal	\$74,327	\$46,516	1.60	\$27,811	6.40
INCOME QUALIFIED PROGRAMS						
	Income Qualified Offers	\$13,970	\$4,035	3.46	\$9,936	3.55
	Subtotal	\$13,970	\$4,035	3.46	\$9,936	3.55
INDIGENOUS PROGRAMS						
	Insulation and Direct Install	\$1,375	\$665	2.07	\$709	5.75
	Small Business	\$863	\$1,081	0.80	(\$218)	11.26
	Community Geothermal	\$5,075	\$228	22.26	\$4,847	0.52
	Metis Income Qualified	\$1,018	\$346	2.94	\$672	4.13
	Subtotal	\$8,331	\$2,321	3.59	\$6,010	3.15
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS						
	Small Business & Appliances	\$24,215	\$10,074	2.40	\$14,141	3.31
	In-Suite Efficiency	\$2,491	\$805	3.09	\$1,686	3.55
	Renovation	\$235,351	\$93,499	2.52	\$141,852	3.29
	HVAC & Controls	\$8,545	\$3,811	2.24	\$4,735	2.88
	New Construction & High-Performance Buildings	\$14,080	\$11,786	1.19	\$2,294	5.84
	Custom	\$46,008	\$29,109	1.58	\$16,899	3.84
	Load Displacement	\$84,119	\$14,922	5.64	\$69,197	0.99
	Subtotal	\$414,809	\$164,006	2.53	\$250,803	2.84
EMERGING TECHNOLOGY PROGRAMS						
	Emerging Technology	\$6,272	\$11,223	0.56	(\$4,951)	11.22
	Subtotal	\$6,272	\$11,223	0.56	(\$4,951)	11.22
Program Impact Totals		\$517,709	\$228,101	2.27	\$289,608	3.36
Program Support, Enabling Strategies & Corporate Overhead		\$0	\$23,883		(\$23,883)	
Overall Portfolio Metrics		\$517,709	\$251,984	2.1	\$265,725	3.71
<i>Note: May not add up due to rounding.</i>						

Electric Program Cost-Effectiveness Metrics		Participant Cost Tests			
		PC Benefit	PC Costs	PC Ratio	PC NPV (000's \$)
RESIDENTIAL PROGRAMS					
	Direct Install	\$5,369	\$1,703	3.15	\$3,666
	Product Rebates	\$31,125	\$14,573	2.14	\$16,552
	Home Renovation	\$20,754	\$8,535	2.43	\$12,219
	New Homes & Major Renovation	\$15,082	\$10,962	1.38	\$4,120
	Home Energy Efficiency Kits & Education	\$2,260	\$241	9.38	\$2,019
	Subtotal	\$74,590	\$36,013	2.07	\$38,576
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$13,448	\$2,942	4.57	\$10,505
	Subtotal	\$13,448	\$2,942	4.57	\$10,505
INDIGENOUS PROGRAMS					
	Insulation and Direct Install	\$1,215	\$257	4.74	\$958
	Small Business	\$1,407	\$572	2.46	\$835
	Community Geothermal	\$4,328	\$0	-	\$4,328
	Metis Income Qualified	\$961	\$233	4.12	\$727
	Subtotal	\$7,911	\$1,062	7.45	\$6,849
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$28,485	\$8,226	3.46	\$20,259
	In-Suite Efficiency	\$2,351	\$346	6.79	\$2,005
	Renovation	\$233,434	\$87,367	2.67	\$146,066
	HVAC & Controls	\$9,475	\$3,273	2.90	\$6,203
	New Construction & High-Performance Buildings	\$15,749	\$10,674	1.48	\$5,075
	Custom	\$44,659	\$27,021	1.65	\$17,637
	Load Displacement	\$84,577	\$14,220	5.95	\$70,357
	Subtotal	\$418,729	\$151,127	2.77	\$267,602
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$8,938	\$10,687	0.84	(\$1,749)
	Subtotal	\$8,938	\$10,687	0.84	(\$1,749)
Program Impact Totals		\$523,615	\$201,832	2.59	\$321,784
Program Support, Enabling Strategies & Corporate Overhead		\$0	\$0		\$0
Overall Portfolio Metrics		\$523,615	\$201,832	2.6	\$321,784

Note: May not add up due to rounding.



Electric Program Cost-Effectiveness Metrics			Participant Payback		
			1st Year		
			Customer Cost	Bill Reduction	Simple Payback
RESIDENTIAL PROGRAMS					
	Direct Install		\$161	\$208	0.77
	Product Rebates		\$4,997	\$2,203	2.27
	Home Renovation		\$2,631	\$636	4.14
	New Homes & Major Renovation		\$2,996	\$272	11.03
	Home Energy Efficiency Kits & Education		\$0	\$126	0.00
		Subtotal	\$10,785	\$3,446	3.13
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers		\$0	\$292	0.00
		Subtotal	\$0	\$292	0.00
INDIGENOUS PROGRAMS					
	Insulation and Direct Install		\$0	\$31	0.00
	Small Business		\$0	\$40	0.00
	Community Geothermal		\$0	\$57	0.00
	Metis Income Qualified		\$0	\$19	0.00
		Subtotal	\$0	\$147	0.00
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances		\$908	\$1,233	0.74
	In-Suite Efficiency		\$59	\$221	0.27
	Renovation		\$17,354	\$8,011	2.17
	HVAC & Controls		\$485	\$175	2.77
	New Construction & High-Performance Buildings		\$2,255	\$467	4.83
	Custom		\$9,154	\$1,692	5.41
	Load Displacement		\$8,252	\$5,767	1.43
		Subtotal	\$38,468	\$17,566	2.19
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology		\$9,003	\$439	20.50
		Subtotal	\$9,003	\$439	20.50
Program Impact Totals			\$58,255	\$21,890	2.66
Program Support, Enabling Strategies & Corporate Overhead			\$0	\$0	
Overall Portfolio Metrics			\$58,255	\$21,890	2.7

Note: May not add up due to rounding.



Electric Program Cost-Effectiveness Metrics		Rate Impact Measure			
		RIM Benefit	RIM Costs	RIM Ratio	RIM NPV (000's \$)
RESIDENTIAL PROGRAMS					
	Direct Install	\$2,482	\$4,361	0.57	(\$1,879)
	Product Rebates	\$17,776	\$31,043	0.57	(\$13,267)
	Home Renovation	\$22,428	\$23,654	0.95	(\$1,227)
	New Homes & Major Renovation	\$19,922	\$15,541	1.28	\$4,381
	Home Energy Efficiency Kits & Education	\$936	\$1,923	0.49	(\$986)
	Subtotal	\$63,544	\$76,522	0.83	(\$12,978)
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$11,786	\$12,804	0.92	(\$1,018)
	Subtotal	\$11,786	\$12,804	0.92	(\$1,018)
INDIGENOUS PROGRAMS					
	Insulation and Direct Install	\$1,293	\$1,559	0.83	(\$266)
	Small Business	\$620	\$1,723	0.36	(\$1,103)
	Community Geothermal	\$5,075	\$4,556	-	\$519
	Metis Income Qualified	\$913	\$990	0.92	(\$77)
	Subtotal	\$7,901	\$8,828	0.89	(\$927)
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$17,585	\$25,064	0.70	(\$7,479)
	In-Suite Efficiency	\$1,768	\$2,235	0.79	(\$467)
	Renovation	\$235,351	\$239,565	0.98	(\$4,214)
	HVAC & Controls	\$8,545	\$10,013	0.85	(\$1,468)
	New Construction & High-Performance Buildings	\$14,080	\$16,861	0.84	(\$2,781)
	Custom	\$46,008	\$46,746	0.98	(\$739)
	Load Displacement	\$84,119	\$85,279	0.99	(\$1,160)
	Subtotal	\$407,456	\$425,764	0.96	(\$18,308)
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$6,272	\$9,474	0.66	(\$3,202)
	Subtotal	\$6,272	\$9,474	0.66	(\$3,202)
Program Impact Totals		\$496,959	\$533,392	0.93	(\$36,434)
Program Support, Enabling Strategies & Corporate Overhead		\$0	\$23,883		(\$23,883)
Overall Portfolio Metrics		\$496,959	\$557,275	0.9	(\$60,317)

Note: May not add up due to rounding.

Based on PUB, COALITION and MIPUG information requests, the following tables provide the natural gas portfolio cost effectiveness results for the program administrator cost test (PACT); total resource cost test (TRC); participating customer cost test (PC); simple customer payback; and rate impact measure (RIM) for each initiative in the Plan.

Natural Gas Program Cost-Effectiveness Metrics		PACT							
		PACT Benefit	PACT Costs	PACT Ratio (A)	PACT NPV (000's \$)	LC Costs	LC Savings	Levelized Cost (cents/m ³) (B)	A * B (cents/m ³)
		2020/23 Efficiency Plan							
RESIDENTIAL PROGRAMS									
	Direct Install	\$573	\$739	0.78	(\$166)	\$739	3,186,430	23.19	17.99
	Product Rebates	\$1,497	\$1,899	0.79	(\$402)	\$1,899	8,375,592	22.68	17.87
	Home Renovation	\$8,723	\$7,242	1.20	\$1,482	\$7,242	43,044,390	16.82	20.27
	New Homes & Major Renovation	\$1,264	\$1,756	0.72	(\$492)	\$1,756	6,254,531	28.07	20.20
	Home Energy Efficiency Kits & Education	\$168	\$411	0.41	(\$243)	\$411	936,220	43.90	17.98
	Subtotal	\$12,225	\$12,047	1.01	\$179	\$12,047	61,797,163	19.49	19.78
INCOME QUALIFIED PROGRAMS									
	Income Qualified Offers	\$8,578	\$17,465	0.49	(\$8,888)	\$17,465	43,354,587	40.29	19.79
	Subtotal	\$8,578	\$17,465	0.49	(\$8,888)	\$17,465	43,354,587	40.29	19.79
INDIGENOUS PROGRAMS									
	Metis Income Qualified	\$406	\$925	0.44	(\$519)	\$925	2,058,909	44.94	19.72
	Subtotal	\$406	\$925	0.44	(\$519)	\$925	2,058,909	44.94	19.72
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS									
	Small Business & Appliances	\$1,261	\$720	1.75	\$541	\$720	7,158,684	10.06	17.61
	In-Suite Efficiency	\$514	\$163	3.15	\$351	\$163	2,866,691	5.68	17.91
	Renovation	\$10,029	\$6,256	1.60	\$3,774	\$6,256	52,785,779	11.85	19.00
	HVAC & Controls	\$6,152	\$2,380	2.59	\$3,773	\$2,380	32,369,206	7.35	19.01
	New Construction & High-Performance Buildings	\$3,859	\$6,552	0.59	(\$2,693)	\$6,552	21,393,894	30.62	18.04
	Custom	\$30,348	\$4,664	6.51	\$25,684	\$4,664	171,635,753	2.72	17.68
	Subtotal	\$52,163	\$20,734	2.52	\$31,429	\$20,734	288,210,006	7.19	18.10
EMERGING TECHNOLOGY PROGRAMS									
	Emerging Technology	\$844	\$948	0.89	(\$104)	\$948	4,429,031	21.40	19.06
	Subtotal	\$844	\$948	0.89	(\$104)	\$948	4,429,031	21.40	19.06
Program Impact Totals		\$74,216	\$52,119	1.42	\$22,097	\$52,119	399,849,696	13.03	18.56
Program Support, Enabling Strategies & Corporate Overhead		\$0	\$7,707		(\$7,707)	\$7,707	-		
Interactive Effects		(\$15,146)	\$0		(\$15,146)	\$0	-79,668,997		
Overall Portfolio Metrics		\$59,070	\$59,827	0.99	(\$756)	\$59,827	320,180,699	18.69	18.45

Note: May not add up due to rounding.



Natural Gas Program Cost-Effectiveness Metrics		Total Resource Cost Tests				
		TRC Benefit	TRC Costs	TRC Ratio	TRC NPV (000's \$)	Levelized Cost (cents/m ³)
2020/23 Efficiency Plan						
RESIDENTIAL PROGRAMS						
	Direct Install	\$2,827	\$1,560	1.81	\$1,267	48.97
	Product Rebates	\$2,191	\$4,480	0.49	(\$2,289)	53.49
	Home Renovation	\$11,983	\$15,257	0.79	(\$3,274)	35.44
	New Homes & Major Renovation	\$1,738	\$5,426	0.32	(\$3,688)	86.75
	Home Energy Efficiency Kits & Education	\$1,215	\$410	2.97	\$805	43.75
	Subtotal	\$19,953	\$27,133	0.74	(\$7,179)	43.91
INCOME QUALIFIED PROGRAMS						
	Income Qualified Offers	\$13,339	\$14,445	0.92	(\$1,106)	33.32
	Subtotal	\$13,339	\$14,445	0.92	(\$1,106)	33.32
INDIGENOUS PROGRAMS						
	Metis Income Qualified	\$647	\$771	0.84	(\$124)	37.45
	Subtotal	\$647	\$771	0.84	(\$124)	37.45
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS						
	Small Business & Appliances	\$6,859	\$1,004	6.83	\$5,855	14.02
	In-Suite Efficiency	\$2,439	\$546	4.47	\$1,893	19.04
	Renovation	\$14,041	\$7,613	1.84	\$6,427	14.42
	HVAC & Controls	\$8,648	\$4,603	1.88	\$4,045	14.22
	New Construction & High-Performance Buildings	\$5,596	\$15,219	0.37	(\$9,623)	71.14
	Custom	\$43,731	\$12,081	3.62	\$31,650	7.04
	Subtotal	\$81,314	\$41,066	1.98	\$40,248	14.25
EMERGING TECHNOLOGY PROGRAMS						
	Emerging Technology	\$1,192	\$3,759	0.32	(\$2,567)	84.87
	Subtotal	\$1,192	\$3,759	0.32	(\$2,567)	84.87
Program Impact Totals		\$116,445	\$87,175	1.34	\$29,271	21.80
Program Support, Enabling Strategies & Corporate Overhead		\$0	\$7,707		(\$7,707)	
Interactive Effects		(\$21,375)	\$0		(\$21,375)	
Overall Portfolio Metrics		\$95,071	\$94,882	1.0	\$189	29.63
<i>Note: May not add up due to rounding.</i>						

Natural Gas Program Cost-Effectiveness Metrics							
				Participant Cost Tests			
				PC Benefit	PC Costs	PC Ratio	PC NPV (000's \$)
2020/23 Efficiency Plan							
RESIDENTIAL PROGRAMS							
	Direct Install			\$3,082	\$1,079	2.86	\$2,003
	Product Rebates			\$3,152	\$3,481	0.91	(\$328)
	Home Renovation			\$18,851	\$14,304	1.32	\$4,547
	New Homes & Major Renovation			\$2,925	\$4,774	0.61	(\$1,849)
	Home Energy Efficiency Kits & Education			\$1,310	\$88	14.89	\$1,222
		Subtotal		\$29,321	\$23,726	1.24	\$5,595
INCOME QUALIFIED PROGRAMS							
	Income Qualified Offers			\$27,208	\$10,296	2.64	\$16,912
		Subtotal		\$27,208	\$10,296	2.64	\$16,912
INDIGENOUS PROGRAMS							
	Metis Income Qualified			\$1,296	\$469	2.76	\$827
		Subtotal		\$1,296	\$469	2.76	\$827
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS							
	Small Business & Appliances			\$7,387	\$908	8.14	\$6,480
	In-Suite Efficiency			\$2,549	\$546	4.67	\$2,003
	Renovation			\$17,897	\$6,956	2.57	\$10,941
	HVAC & Controls			\$8,987	\$3,839	2.34	\$5,148
	New Construction & High-Performance Buildings			\$9,782	\$13,813	0.71	(\$4,031)
	Custom			\$37,325	\$11,230	3.32	\$26,095
		Subtotal		\$83,927	\$37,291	2.25	\$46,636
EMERGING TECHNOLOGY PROGRAMS							
	Emerging Technology			\$1,753	\$3,576	0.49	(\$1,823)
		Subtotal		\$1,753	\$3,576	0.49	(\$1,823)
Program Impact Totals				\$143,505	\$75,358	1.90	\$68,147
Program Support, Enabling Strategies & Corporate Overhead				\$0	\$0		\$0
Interactive Effects				(\$20,644)	\$0		(\$20,644)
Overall Portfolio Metrics				\$122,861	\$75,358	1.6	\$47,503

Note: May not add up due to rounding.

Natural Gas Program Cost-Effectiveness Metrics				
			Participant Payback	
			1st Year	Simple
			Customer Cost	Payback
			Bill Reduction	
2020/23 Efficiency Plan				
RESIDENTIAL PROGRAMS				
	Direct Install		\$191	2.43
	Product Rebates		\$1,509	11.74
	Home Renovation		\$5,465	14.99
	New Homes & Major Renovation		\$1,595	41.58
	Home Energy Efficiency Kits & Education		\$0	0.00
	Subtotal		\$8,761	12.87
INCOME QUALIFIED PROGRAMS				
	Income Qualified Offers		\$0	0.00
	Subtotal		\$0	0.00
INDIGENOUS PROGRAMS				
	Metis Income Qualified		\$0	0.00
	Subtotal		\$0	0.00
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS				
	Small Business & Appliances		\$100	0.26
	In-Suite Efficiency		\$89	1.43
	Renovation		\$783	3.71
	HVAC & Controls		\$1,013	7.07
	New Construction & High-Performance Buildings		\$2,782	17.65
	Custom		\$3,499	2.86
	Subtotal		\$8,266	3.78
EMERGING TECHNOLOGY PROGRAMS				
	Emerging Technology		\$1,754	55.77
	Subtotal		\$1,754	55.77
Program Impact Totals			\$18,781	5.77
Program Support, Enabling Strategies & Corporate Overhead			\$0	
Interactive Effects			\$0	(\$650)
Overall Portfolio Metrics			\$18,781	7.2

Note: May not add up due to rounding.

Natural Gas Program Cost-Effectiveness Metrics						
Rate Impact Measure						
					RIM NPV (000's \$)	
					RIM Benefit	
					RIM Costs	
					RIM Ratio	
2020/23 Efficiency Plan						
RESIDENTIAL PROGRAMS						
	Direct Install		\$573	\$1,575	0.36	(\$1,001)
	Product Rebates		\$1,497	\$4,144	0.36	(\$2,647)
	Home Renovation		\$8,723	\$19,804	0.44	(\$11,080)
	New Homes & Major Renovation		\$1,264	\$3,577	0.35	(\$2,313)
	Home Energy Efficiency Kits & Education		\$168	\$663	0.25	(\$495)
	Subtotal		\$12,225	\$29,762	0.41	(\$17,537)
INCOME QUALIFIED PROGRAMS						
	Income Qualified Offers		\$8,578	\$29,911	0.29	(\$21,333)
	Subtotal		\$8,578	\$29,911	0.29	(\$21,333)
INDIGENOUS PROGRAMS						
	Metis Income Qualified		\$406	\$1,515	0.27	(\$1,109)
	Subtotal		\$406	\$1,515	0.27	(\$1,109)
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS						
	Small Business & Appliances		\$1,261	\$2,476	0.51	(\$1,215)
	In-Suite Efficiency		\$514	\$861	0.60	(\$348)
	Renovation		\$10,029	\$18,554	0.54	(\$8,525)
	HVAC & Controls		\$6,152	\$9,751	0.63	(\$3,598)
	New Construction & High-Performance Buildings		\$3,859	\$11,188	0.34	(\$7,329)
	Custom		\$30,348	\$38,177	0.79	(\$7,829)
	Subtotal		\$52,163	\$81,007	0.64	(\$28,844)
EMERGING TECHNOLOGY PROGRAMS						
	Emerging Technology		\$844	\$1,936	0.44	(\$1,092)
	Subtotal		\$844	\$1,936	0.44	(\$1,092)
Program Impact Totals			\$74,216	\$144,131	0.51	(\$69,915)
Program Support, Enabling Strategies & Corporate Overhead			\$0	\$7,707		(\$7,707)
Interactive Effects			(\$15,146)	(\$20,644)		\$5,498
Overall Portfolio Metrics			\$59,070	\$131,194	0.5	(\$72,124)

Note: May not add up due to rounding.

- b. Efficiency Manitoba did not complete a quantitative analysis of the social, economic, or environmental benefits by DSM initiative or bundle with the exception of greenhouse gas (GHG) environmental benefits associated with the reduction of natural gas consumption within Manitoba. Analysis of these environmental benefits are included in Attachment 3 of the Plan (p. 509 of 591).

REFERENCE:

Appendix A – Section A7 – Commercial, Industrial & Agricultural Programs & Attachment 3 – Technical Tables, pdf pages 506 - 518

PREAMBLE TO IR (IF ANY):**QUESTION:**

- a. Please provide a general description of why the Annual Electric Energy Savings from Custom Offers declines in 2021/22 compared 2020/21 (ref: Table A7.12, pdf page 395 of 591), especially given both years have the same amount of projects. Please indicate the role and amount of savings persistence, if any, in the decline.
- b. As per (a) above, If savings persistence is not included in Table A7.12, please provide a separate row for savings persistence included in any cost-effectiveness calculations.
- c. Please provide a general description why the Annual Electric Energy Savings from Load Displacement declines from 120.52 GWh in 2021/22 to 110.45 GWh in 2022/23 (ref: Table A7.14, pdf page 399 of 591).
- d. Please provide a narrative description, as well as supporting mathematical calculations if possible, for how the Annual capacity savings (MW) benefit of the Load Displacement Program (ref: Table A7.14, pdf page 399 of 591) is included in the calculation of DSM program metrics for this program, if at all.
- e. EM's plan includes <10 Load Displacement projects in each year of the plan as per Table A7.14 (pdf page 399 of 591). What proportion of load displacement projects and annual savings by costs/activities is represented as pursued by EM with signed agreements following the in-service of EM, versus ongoing savings from past load displacement agreements signed with Manitoba Hydro?
- f. Please explain, with calculations, why the "Custom Offers" industrial program saves an average \$1.245 million/year in customer bills (pdf page 517 of 591) on a load reduction of 17.9 to 28.6 GW.h/year (pdf page 513 of 591) an average of 5.2 cents/kW.h, while the load displacement program saves an average of \$1.983 million/year in customer bills (pdf page 517 of 591) on a load reduction of 99.0 to 120.5 GW.h/year (pdf page 513 of 591) an average of only 1.8 cents/kW.h in customer bill savings.

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- g. Given the levelized cost of industrial programming is generally well below many programming options for other classes (per Figure A3.7, pdf page 261 of 591), please describe the evaluation and decision-making process of EM to include higher cost programs (e.g., residential direct install or home renovation) as opposed to added program scope or magnitude in lower cost programs (e.g., industrial customer, load displacement, renovation, or equivalent lower cost agricultural or commercial program offerings). Please indicate all quantitative considerations for determining the level of investment in programs of materially different cost metrics.
- h. Please provide a revised assessment of the plan metrics (including annual energy savings, savings percent and annual acquisition costs) in the event all Residential, Commercial, Industrial and Agricultural programs above 3.14 cents/kW.h levelized cost were eliminated from the plan (not Indigenous or Income Qualified), including the savings target that would be achieved and the revised PACT ratio, NPV and levelized cost of the portfolio (as shown in Table 5.3, pdf page 135 of 591) and LRI impact (Table 5.6 on pdf page 139 of 591). Please indicate whether any resulting changes would arise in respect of the EM overhead and support costs that could arise in this situation and include this reduction in the calculation of revised metrics.

RATIONALE FOR QUESTION:

MIPUG wishes to understand the assumptions made regarding the level of participation, cost and benefits for commercial and industrial programs.

RESPONSE:

- a) The decrease in electric energy savings between the 2020/21 and 2021/22 is due to the timing of large industrial energy efficiency projects within the Custom Program Bundle. In these instances, there are a relatively few projects which are impacting variations in annual electric energy savings and anticipated budget. Due to the small number of customers participating within the Customer Offers along with installation verification program requirements, the savings persistence factor (see definition in 2020/23 Efficiency Plan, Attachment 1.2, p. 444 of 591) is taken as 100% for these projects.
- b) Please see MIPUG/EM I-2a.

- c) The reason for the decrease in electric energy savings between the 2021/22 and 2022/23 is due to the timing of large industrial energy efficiency projects within the Load Displacement Offer.
- d) Please see DAYMARK/EM I-20.
- e) Efficiency Manitoba has included one agreement and ongoing savings from a past load displacement agreement signed with Manitoba Hydro. See PUB/EM 1-31.
- f) As outlined in MIPUG/EM I-1a, in the case of the Load Displacement program, activities within the Plan include operating contribution commitments including new annual energy savings and operating incentives throughout the duration of the project. This impacts the incremental energy volumes that should be used when calculating the average rate of customer bill savings (cents/kW.h) requested within this information request. To illustrate, in the case of the Load Displacement program the average rate of customer bill savings of \$1.983 million corresponds to an average energy savings of 44 GWh [namely $(99 + 21.5 + 11.5 \text{ GWh})/3$ or 44 GWh]. This results in an average customer bill savings of \$0.045/kWh.
- g) The level of programming offered to the industrial, commercial and agricultural segment was not limited by the inclusion of higher cost programs in the residential market segment. Efficiency Manitoba is aiming to pursue all energy savings opportunities in order to meet the legislated energy savings targets as well as the legislated consideration of ensuring that initiatives are available to all Manitobans. Efficiency Manitoba will continue working with MIPUG and their members either directly or through the activities of the Energy Efficiency Advisory Group to identify energy savings opportunities of mutual benefit to customers and Efficiency Manitoba.
- h) The following tables provide the electric portfolio results provided that the following Program Bundles (with electric program administrator cost test levelized costs above 3.14 cents/kWh) are removed from the electric portfolio:
- Residential Direct Install (removed)

- Residential Product Rebates (removed)
- Residential Home Renovation (removed)

As noted in PUB/EM I-11a, the electric portfolio PACT results have been revised for the Indigenous Small Business and the commercial, industrial and agricultural Small Business & Appliances program bundles. The corrected values are highlighted.

The requested lifecycle rate impact analysis does not exist and would require scenario analysis and modelling which cannot be produced with reasonable effort in the time available.

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Annual Electric Energy Savings (GW.h) Comparison		2020/21	2021/22	2022/23
RESIDENTIAL PROGRAMS				
	Direct Install	-	-	-
	Product Rebates	-	-	-
	Home Renovation	-	-	-
	New Homes & Major Renovation	3.3	3.6	3.7
	Home Energy Efficiency Kits & Education	0.6	1.0	1.0
	Subtotal	3.9	4.6	4.6
INCOME QUALIFIED PROGRAMS				
	Income Qualified Offers	2.5	2.7	2.7
	Subtotal	2.5	2.7	2.7
INDIGENOUS PROGRAMS				
	Insulation and Direct Install	0.2	0.3	0.3
	Small Business	0.4	0.4	0.4
	Community Geothermal	0.8	1.2	1.2
	Metis Income Qualified	0.2	0.2	0.2
	Subtotal	1.5	2.1	2.2
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS				
	Small Business & Appliances	14.8	15.2	15.6
	In-Suite Efficiency	0.7	1.0	1.3
	Renovation	110.7	103.1	95.5
	HVAC & Controls	3.3	3.5	3.5
	New Construction & High-Performance Buildings	6.0	8.8	7.2
	Custom	24.2	17.9	28.6
	Load Displacement	99.0	120.5	110.5
	Subtotal	258.7	269.9	262.2
EMERGING TECHNOLOGY PROGRAMS				
	Emerging Technology	-	1.0	5.9
	Subtotal	-	1.0	5.9
Program Impact Totals		267	280	278
Codes, Standards & Regulations		88	103	108
Total Energy Savings (GW.h) at Generation		355	383	386
<i>Note: May not add up due to rounding.</i>				

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Annual Electric Capacity Savings (MW)				
		2020/21	2021/22	2022/23
RESIDENTIAL PROGRAMS				
	Direct Install	-	-	-
	Product Rebates	-	-	-
	Home Renovation	-	-	-
	New Homes & Major Renovation	1.7	1.8	1.8
	Home Energy Efficiency Kits & Education	0.0	0.1	0.1
	Subtotal	1.7	1.9	1.9
INCOME QUALIFIED PROGRAMS				
	Income Qualified Offers	0.9	0.9	0.9
	Subtotal	0.9	0.9	0.9
INDIGENOUS PROGRAMS				
	Insulation and Direct Install	0.1	0.1	0.1
	Small Business	0.1	0.1	0.1
	Community Geothermal	0.4	0.6	0.6
	Metis Income Qualified	0.1	0.1	0.1
	Subtotal	0.6	0.9	0.9
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS				
	Small Business & Appliances	2.3	2.4	2.4
	In-Suite Efficiency	0.2	0.3	0.4
	Renovation	33.1	31.1	28.9
	HVAC & Controls	0.6	0.6	0.7
	New Construction & High-Performance Buildings	1.2	1.6	1.6
	Custom	4.0	2.5	4.1
	Load Displacement	13.8	16.3	15.3
	Subtotal	55.1	54.8	53.4
EMERGING TECHNOLOGY PROGRAMS				
	Emerging Technology	-	0.6	0.6
	Subtotal	-	0.6	0.6
Program Impact Totals		58	59	58
Codes, Standards & Regulations		23	29	31
Total Capacity Savings (MW) at Generation		81	88	89
<i>Note: May not add up due to rounding.</i>				

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TOTAL Annual Electric Costs (000's \$)						
		2020/21	2021/22	2022/23		
RESIDENTIAL PROGRAMS						
	Direct Install	\$0	\$0	\$0		
	Product Rebates	\$0	\$0	\$0		
	Home Renovation	\$0	\$0	\$0		
	New Homes & Major Renovation	\$913	\$1,149	\$1,168		
	Home Energy Efficiency Kits & Education	\$158	\$230	\$234		
	Subtotal	\$1,071	\$1,378	\$1,402		
INCOME QUALIFIED PROGRAMS						
	Income Qualified Offers	\$1,188	\$1,660	\$1,637		
	Subtotal	\$1,188	\$1,660	\$1,637		
INDIGENOUS PROGRAMS						
	Insulation and Direct Install	\$196	\$256	\$272		
	Small Business	\$313	\$370	\$472		
	Community Geothermal	\$323	\$505	\$515		
	Metis Income Qualified	\$97	\$141	\$140		
	Subtotal	\$929	\$1,272	\$1,398		
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS						
	Small Business & Appliances	\$2,636	\$2,698	\$2,763		
	In-Suite Efficiency	\$204	\$253	\$303		
	Renovation	\$17,425	\$16,710	\$15,961		
	HVAC & Controls	\$1,006	\$1,083	\$1,142		
	New Construction & High-Performance Buildings	\$1,516	\$1,875	\$1,667		
	Custom	\$3,021	\$2,668	\$3,749		
	Load Displacement	\$984	\$5,693	\$3,357		
	Subtotal	\$26,793	\$30,980	\$28,942		
EMERGING TECHNOLOGY PROGRAMS						
	Emerging Technology	\$124	\$317	\$1,463		
	Subtotal	\$124	\$317	\$1,463		
Program Totals		\$30,104	\$35,607	\$34,842		
Enabling Strategies: Program Support and Education		\$1,289	\$1,312	\$1,355		
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$4,897	\$5,068	\$4,854		
Corporate Overhead		\$1,844	\$1,841	\$2,889		
Total Electric Costs (000's \$)		\$38,135	\$43,828	\$43,940		
<i>Note: May not add up due to rounding.</i>						

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Electric Program Cost-Effectiveness Metrics		PACT		
		Ratio (A)	PACT NPV (000's \$)	Levelized Cost (cents/kWh) (B)
RESIDENTIAL PROGRAMS				
	Direct Install	#DIV/0!	\$0	#DIV/0!
	Product Rebates	#DIV/0!	\$0	#DIV/0!
	Home Renovation	#DIV/0!	\$0	#DIV/0!
	New Homes & Major Renovation	6.56	\$16,885	1.84
	Home Energy Efficiency Kits & Education	1.61	\$353	3.05
	Subtotal	5.76	\$17,239	1.97
INCOME QUALIFIED PROGRAMS				
	Income Qualified Offers	2.80	\$7,576	3.70
	Subtotal	2.80	\$7,576	3.70
INDIGENOUS PROGRAMS				
	Insulation and Direct Install	1.90	\$613	5.88
	Small Business	0.57	(\$461)	11.26
	Community Geothermal	4.03	\$3,816	2.86
	Metis Income Qualified	2.58	\$559	4.23
	Subtotal	2.34	\$4,527	4.59
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS				
	Small Business & Appliances	2.30	\$9,945	2.51
	In-Suite Efficiency	2.48	\$1,055	3.14
	Renovation	4.97	\$187,957	1.67
	HVAC & Controls	2.81	\$5,501	2.30
	New Construction & High-Performance Buildings	2.95	\$9,311	2.36
	Custom	5.18	\$37,133	1.17
	Load Displacement	3.72	\$61,521	1.50
	Subtotal	4.29	\$312,423	1.65
EMERGING TECHNOLOGY PROGRAMS				
	Emerging Technology	2.96	\$4,156	2.11
	Subtotal	2.96	\$4,156	2.11
Program Impact Totals		4.19	\$345,922	1.74
Program Support, Enabling Strategies & Corporate Overhead			(\$23,883)	
Overall Portfolio Metrics		3.44	\$322,039	2.12

Note: May not add up due to rounding.

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 benefits⁴⁹). 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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Description	Total Three-Year Electric Savings (GWh)	PACT Ratio	TRC Ratio
2020-2023 Electric EE Plan	880.1	3.27	2.05

Table 27: Electric Portfolio level Cost Effectiveness results

At the bundle level, as shown in Table 28, the results from the TRC test show that, for the electricity portfolio, almost all proposed bundles continue to show benefits exceeding costs (with the exception being emerging technologies). In some cases, however, the numbers do shift considerably. This shift makes sense, in the case of items such as “new homes and major renovations,” for which one would anticipate that considerable customer investment is required. On the other hand, TRC ratios higher than PACT ratios reflect programs involving incentives or payments to customers that go beyond the cost of the measure itself.

DSM Bundle	Total Three-Year Electric Savings (GWh)	PACT Ratio	TRC Ratio
New Homes & MR	10.6	6.56	1.74
Custom	70.6	5.18	1.58
Renovation	309.3	4.97	2.52
Community Geothermal	3.3	4.03	22.26
Load Displacement	330.0	3.72	5.64
Emerging Technology	6.9	2.96	0.56
New Construction & HPB	21.9	2.95	1.19
Home Renovation	15.3	2.90	1.92
HVAC & Controls	10.3	2.81	2.24
Income Qualified	7.9	2.80	3.46
Metis Income Qualified	0.6	2.58	2.94
In Suite Efficiency	3.0	2.48	3.09
Small Business & Appliance	45.7	2.30	2.40
Insulation and Direct Install	0.8	1.90	2.07
Product Rebates	34.7	1.74	1.24
Home EE Kits & Education	2.5	1.61	3.14
Direct Install	5.7	1.53	1.99
Small Business	1.2	0.57	0.80
Program Support	-	-	-
Total	880.1	3.27	2.05

Table 28: Electric Bundle level Cost Effectiveness results

For the natural gas portfolio, application of the TRC Test actually results in a slight improvement in the reported benefit/cost ratio, as can be seen in Table 29, below, reflecting the additional value of greenhouse gas emissions reductions being counted as part of the TRC analysis.

Description	Total Three-Year Natural Gas Savings (million cu m)	PACT Ratio	TRC Ratio
2020-2023 Natural Gas EE Plan	25.7	0.99	1.00

Table 29: Natural Gas portfolio level cost effectiveness results

Drawing on Efficiency Manitoba’s workpapers, we examined the TRC Ratio for bundles in the natural gas portfolio, compared to PACT ratios, shown in Table 30.

DSM Bundle	Total Three-Year Savings (m3)	PACT Ratio	TRC Ratio
Custom	13,348,583	6.51	3.62
In Suite Efficiency	346,736	3.15	4.47
HVAC & Controls	2,268,681	2.59	1.88
Small Business & Appliance	958,599	1.75	6.83
Renovation	3,387,948	1.60	1.84
Home Renovation	2,737,423	1.20	0.79
Emerging Technology	332,286	0.89	0.32
Product Rebates	1,205,670	0.79	0.49
Direct Install	499,384	0.78	1.81
New Homes & MR	401,910	0.72	0.32
New Construction & HPB	2,287,686	0.59	0.37
Income Qualified	3,237,979	0.49	0.92
Metis Income Qualified	157,774	0.44	0.84
Home EE Kits & Education	139,893	0.41	2.97
Program Support	-	-	0.00
Interactive Effects	(5,585,543)	-	-
Total	25,725,008	0.99	100%

Table 30: Natural Gas Bundle level Cost Effectiveness results

The natural gas bundle level results show dramatic improvement for three bundles: Direct Install, Home Energy Kits, Income Qualified, and Metis Income Qualified. The results also show substantial decreases for Product Rebates, New Home & MR, and emerging technology.

Overall, however, the TRC test does not dramatically change the cost-benefit picture at the portfolio level.

F. Testing energy efficiency measure values

In the prior sections of this cost effectiveness review, the data has shown that there are few natural gas bundles that have PACT and TRC ratios below 1.0. Reflecting on the dynamics between the benefits and the different type of costs we thought some additional drill down to the measure level could be helpful. The most basic question that we wanted to answer is, “Is it good for Manitoba for a measure to get installed, whether there is a program or not?”. In order to answer this question, we had to select a cost effectiveness test that was appropriate. We felt that the Manitoba perspective from the benefits side would include at least the marginal value of electricity for electric saving measures and the marginal value of natural gas plus the value of GHG reduction for natural gas savings measure, along with the value of water savings. These are the same benefits as described above in the TRC Test. There are other benefits that could be included in the total resource cost analysis such as non-energy benefits but for now the we are working with the benefits prescribed in the Act and Regulations.

The next question is, “What costs are relevant to answer the question posed for Manitoba at the measure level?” The costs that Daymark is choosing as most relevant are only the costs of the measure itself. That would be, for example, the incremental cost of an efficient piece of equipment compared to a standard piece of the functionally similar equipment. If we wanted to think in program terminology, it would be the sum of participant cost and utility incentive. In this report we are going to refer to this test as the Pure Measure Value Test (PMVT). This PMVT will indicate whether it is good for Manitoba if someone installs a measure without any program existing.

Why is this important? Efficiency Manitoba, in order to meet the target savings established in the ACT and regulations, has put forward a natural gas portfolio where some bundles are producing negative NPV or PACT and TRC ratios less than one. . Is this the result of choosing poor measures that do not save enough energy and dollars, or is this the result of having to expend relatively high amounts on program related costs too high? The answer to this question may determine what, if anything, should be changed in the Plan.

Thus, we performed the PMVT on each measure, electric and natural gas. In Table 31 below we show that at the electric portfolio level 7% of the savings come from measures for which the measure cost alone is larger than the benefits. We calculate how removing those measures from the Plan would increase the PACT ratio and the TRC ratio. Similarly, the natural gas portfolio gets 26% of its savings from measures for which the measure cost exceeds the benefits.

Description	Total Three-Year Energy Savings (GWh or million cu m)	PACT Ratio	TRC Ratio	Savings from measures with PMVT ratios <1
2020-2023 Electric EE Plan	880.1	3.27	2.05	7%
2020-2023 Natural Gas EE Plan	25.7	0.99	1.00	26%

Table 31: Portfolio-level results after the pure measure value test

This analysis should not be taken as a recommendation to reduce the portfolios or eliminate certain measures. The PACT, TRC and Daymark created PMVT to all look at the energy efficiency program investments in the three-year period in isolation. By this we mean that our analysis does not consider any residual benefits associated with these investments after the measure life of those installed. An example of why this may be important relates to market transformation. An objective of every energy efficiency program is to help the technology become mainstream, either due to customer acceptance or through the technology becoming part of codes & standards. That benefit is not considered in the calculation of the cost effectiveness of the bundles in this Plan.

There can be additional bundle strategic values which are not included in Efficiency Manitoba’s or Daymark’s analyses, such as:

- Market transformation
- Societal benefits
- Important to the local economy, etc.

With this discussion as context, we can now look at the bundles and see what portion of any bundles have measures that perform relatively poorly from an economic perspective.

Table 32: Bundle-level results after pure measure value test – electric portfolio shows that five electric saving bundles have significant savings associated with low PMVT ratio measures;

- Emerging technology
- New construction & HPB
- Home renovation
- In Suite efficiency
- Product rebates

These bundles warrant some more detailed evaluation to see if all the measures should remain in the offering.

DSM Bundle	Total Three-Year Electric Savings (GWh)	PACT Ratio	TRC Ratio	Savings from measures with PMVT ratios <1
New Homes & MR	10.6	6.56	1.74	0%
Custom Renovation	70.6	5.18	1.58	12%
Community Geothermal	309.3	4.97	2.52	2%
Load Displacement	3.3	4.03	22.26	0%
Emerging Technology	330.0	3.72	5.64	0%
New Construction & HPB	6.9	2.96	0.56	72%
Home Renovation	21.9	2.95	1.19	70%
HVAC & Controls	15.3	2.90	1.92	37%
Income Qualified	10.3	2.81	2.24	-2%
Metis Income Qualified	7.9	2.80	3.46	13%
In Suite Efficiency	0.6	2.58	2.94	12%
Small Business & Appliance	3.0	2.48	3.09	45%
Insulation and Direct Install	45.7	2.30	2.40	7%
Product Rebates	0.8	1.90	2.07	3%
Home EE Kits & Education	34.7	1.74	1.24	44%
Direct Install	2.5	1.61	3.14	8%
Small Business	5.7	1.53	1.99	19%
Program Support	1.2	0.57	0.80	-8%
Total	880.1	3.27	2.05	7%

Table 32: Bundle-level results after pure measure value test – electric portfolio

Table 33: Bundle-level results after pure measure value test – natural gas portfolio shows that four natural gas saving bundles have the majority or all their savings associated with low PMVT ratio measures;

- Emerging technology
- New construction & HPB
- New home & major renovation
- Product rebates

These bundles warrant some more detailed evaluation to see if all the measures should remain in the offering.

DSM Bundle	Total Three-Year Electric Savings (GWh)	PACT Ratio	TRC Ratio	Savings from measures with PMVT ratios <1
New Homes & MR	10.6	6.56	1.74	0%
Custom	70.6	5.18	1.58	12%
Renovation	309.3	4.97	2.52	2%
Community Geothermal	3.3	4.03	22.26	0%
Load Displacement	330.0	3.72	5.64	0%
Emerging Technology	6.9	2.96	0.56	72%
New Construction & HPB	21.9	2.95	1.19	70%
Home Renovation	15.3	2.90	1.92	37%
HVAC & Controls	10.3	2.81	2.24	-2%
Income Qualified	7.9	2.80	3.46	13%
Metis Income Qualified	0.6	2.58	2.94	12%
In Suite Efficiency	3.0	2.48	3.09	45%
Small Business & Appliance	45.7	2.30	2.40	7%
Insulation and Direct Install	0.8	1.90	2.07	3%
Product Rebates	34.7	1.74	1.24	44%
Home EE Kits & Education	2.5	1.61	3.14	8%
Direct Install	5.7	1.53	1.99	19%
Small Business	1.2	0.57	0.80	-8%
Program Support	-	-	-	-
Total	880.1	3.27	2.05	7%

Table 33: Bundle-level results after pure measure value test – natural gas portfolio

Strategically, in evaluating bundles with a relatively questionable economic and strategic value, measure life might also be something to consider. One of the strategic reasons for the increased focus on energy efficiency in the Act is to help defer or avoid a major capital project. The shorter the measure life, the less likely that the bundles are contributing to that objective.

The tables below were produced from the detailed worksheets provided by Efficiency Manitoba and show measure savings grouped by different five-year measure life strata. Table 34: Savings by measure-life Group – electric not only shows the total savings associated with each group of measures but provides the cumulative impacts of the measures from the shortest-lived to the longest-lived. So, for example, for the first measure life group (measures with a lifespan of 1-5 years), the measures expected in the plan total 42% of projected three-year electric portfolio savings. For the second group of measures (measures with a lifespan of 6-10 years) the percent of total savings is 3%, and for the third group (11-15 years), the percent of total savings is 39%. The cumulative column shows that these three groups total 84% of savings--that is, it shows that 84% of the electric savings project in the Plan come from measures with expected lives of 15 years or less.

In Table 35: Savings by measure-life group – natural gas, the same format is used. The table shows that only 22% of the projected natural gas savings come from measures with lives of 15 years or less.

Year Range	Total Three-Year Savings (kWh)	Savings as % of Total	Cumulative Savings %
1-5	371,112,450	42%	42%
6-10	27,286,730	3%	45%
11-15	345,589,248	39%	84%
16-20	76,082,351	9%	93%
21-25	42,615,692	5%	98%
26-30	12,264,138	1%	99%
31+	5,767,240	1%	100%
Total	880,717,849		

Table 34: Savings by measure-life Group – electric

REFERENCE:

Table 17 – Savings by Measure Life – Electric & Table 18 – Savings by Measure Life – Natural Gas (Page 74, Section IV, Part B.b)

PREAMBLE TO IR (IF ANY):

While electric and natural gas savings are one measure of contribution to program objects. The PACT NPV is another measure of value that relates directly to measure life.

RATIONALE:

MIPUG is seeking to understand how the PACT NPV relates to measure life.

QUESTION:

- (a) Please reproduce Tables 17 and 18 for respective electric and natural gas savings, relating the PACT value to the measure life, showing strata PACT NPV and cumulative NPV.

RESPONSE:

- (a) Since Efficiency Manitoba considered program support costs at the portfolio level, estimating measure-level PACT NPV is a challenge, since there is no straightforward way to appropriately allocate the portfolio-level program support costs to the measures considered in the Plan. Therefore, instead of reporting measure-level PACT cost-effectiveness, Daymark constructed the Pure Measure Value Test (“PMVT”) as a means to investigate measure level economics. This test is described, and the results provided in Section IV.F in the Daymark Report (Page 93 – 98). Consistent with the discussion in the Report, we provide net PMVT breakdown by measure-level in two new tables below (one for the electric portfolio and one for the natural gas portfolio) which add additional information to the original Table 17 and Table 18. Please note that Table 17 included in the Report has been revised.

The original Table 17, included in Daymark Report, is below:

Year Range	Total Three-Year Savings (kWh)	Savings as % of Total	Cumulative Savings %
1-5	371,112,450	42%	42%
6-10	27,286,730	3%	45%
11-15	345,589,248	39%	84%
16-20	76,082,351	9%	93%
21-25	42,615,692	5%	98%
26-30	12,264,138	1%	99%
31+	5,767,240	1%	100%
Total	880,717,849		

The revised Table 17 is below:

Year Range	Total Three-Year Savings (kWh)	Savings as % of Total	Cumulative Savings %
1-5	348,505,184	40%	40%
6-10	65,873,774	7%	47%
11-15	400,879,233	46%	93%
16-20	21,957,879	2%	95%
21-25	24,329,811	3%	98%
26-30	13,404,729	2%	99%
31+	5,767,240	1%	100%
Total	880,717,849		

The table below expands Table 17 by adding the requested information in this IR:

Year Range	Total Three-Year Savings (kWh)	Savings as % of Total	Cumulative Savings %	Net PMVT NPV (\$)	Net PMVT NPV as % of Total
1-5	348,505,184	40%	40%	\$73,600,828	25%
6-10	65,873,774	7%	47%	\$8,723,079	3%
11-15	400,879,233	46%	93%	\$159,392,126	54%
16-20	21,957,879	2%	95%	\$14,062,494	5%
21-25	24,329,811	3%	98%	\$14,299,934	5%
26-30	13,404,729	2%	99%	\$18,119,145	6%
31+	5,767,240	1%	100%	\$4,357,415	1%
Total	880,717,849	100%		292,555,022	100%

The original Table 18, included in the Daymark Report, is below:

Year Range	Total Three-Year Savings (m3)*	Savings as % of Total	Cumulative Savings %
1-5	1,112,134	4%	4%
6-10	1,070,171	3%	7%
11-15	4,785,178	15%	22%
16-20	7,843,158	25%	47%
21-25	13,344,427	43%	90%
26-30	2,864,947	9%	99%
31+	162,666	1%	100%
Total	31,182,679		

*Does not include program-level interactive effects.

The table below expands Table 18 by adding the requested information in this IR:

Year Range	Total Three-Year Savings (kWh)	Savings as % of Total	Cumulative Savings %	Net PMVT NPV (\$)	Net PMVT NPV as % of Total
1-5	795,873	3%	3%	\$4,079,184	13%
6-10	3,890,656	12%	15%	\$3,638,723	11%
11-15	10,038,209	32%	47%	\$6,887,524	21%
16-20	1,237,585	4%	51%	-\$3,743,300	-12%
21-25	12,184,581	39%	90%	\$24,570,325	76%
26-30	2,873,109	9%	99%	-\$895,929	-3%
31+	162,666	1%	100%	-\$2,166,313	-7%
Total	31,182,679	100%		32,370,214	100%

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Table 3.14: Codes & Standards Targets (Commercial and Residential Sectors)

Reference Fiscal Year	2018 Electric Load Forecast (GWh)	Target Fiscal Year	Anticipated Savings (per Plan)	% of Load
2019/20	16,045	2020/21	88	0.55%
2020/21	16,034	2021/22	103	0.64%
2021/22	15,961	2022/23	108	0.68%

Tables 3.10 – 3.14 illustrate that incentive-based programs targeting the Industrial sector are anticipated to provide greater savings on both a GWh and percent of load basis, targeting savings levels of between 1.60% to 1.75% of industrial load. This table recognizes that cost-effectiveness and strong contribution that industrial energy savings provide to the Three-Year Plan.

3.2.4 Industrial Sector Electric Savings Acquisition Costs

Acquisition costs can be estimated by dividing the annual expenditures per sector for each year of the plan by the incremental savings achieved in each year of the plan. The anticipated savings and budget allocations were drawn from MIPUG/EM I-6a-e.

Table 3.15: Industrial Sector Savings Acquisition Costs (no applicable Codes & Standards)

Target Fiscal Year	Anticipated Savings (per Plan)	Anticipated Budget (% of Total)	Anticipated Budget (per Plan)	Acquisition Cost (\$/kWh)
2020/21	146	18%	\$7,874,000	\$0.054
2021/22	161	24%	\$12,077,000	\$0.075
2022/23	156	20%	\$10,281,000	\$0.066

Table 3.16: Commercial Sector Savings Acquisition Costs (without Codes & Standards)

Target Fiscal Year	Anticipated Savings (per Plan)	Anticipated Budget (% of Total)	Anticipated Budget (per Plan)	Acquisition Cost (\$/kWh)
2020/21	100	40%	\$17,619,000	\$0.177
2021/22	98	35%	\$17,763,000	\$0.181
2022/23	94	34%	\$17,494,000	\$0.186

Table 3.17: Residential Sector Savings Acquisition Costs (without Codes & Standards)

Target Fiscal Year	Anticipated Savings (per Plan)	Anticipated Budget (% of Total)	Anticipated Budget (per Plan)	Acquisition Cost (\$/kWh)
2020/21	22	18%	\$8,104,000	\$0.362
2021/22	24	18%	\$9,388,000	\$0.384
2022/23	26	20%	\$10,142,000	\$0.384

Table 3.18: Agricultural Sector Acquisition Costs (no applicable Codes & Standards)

Target Fiscal Year	Anticipated Savings (per Plan)	Anticipated Budget (% of Total)	Anticipated Budget (per Plan)	Acquisition Cost (\$/kWh)
2020/21	13	4%	\$1,990,000	\$0.154
2021/22	12	4%	\$1,961,000	\$0.166
2022/23	13	4%	\$2,170,000	\$0.166

Table 3.19: Codes & Standards Acquisition Costs

Target Fiscal Year	Anticipated Savings (per Plan)	Anticipated Budget (% of Total)	Anticipated Budget (per Plan)	Acquisition Cost (\$/kWh)
2020/21	88	4%	\$382,000	\$0.004
2021/22	103	4%	\$382,000	\$0.004
2022/23	108	4%	\$382,000	\$0.004

The above analysis demonstrates that acquisition costs for savings from Codes & Standards initiatives and incentive-based Industrial programs are well below those achieved through incentive-based programs for Residential and Commercial programs. Broadly speaking, Industrial savings acquisition costs from incentive-based programs are anticipated to be about 1/3 of incentive-based Commercial sector acquisition costs and about 1/5 of Residential sector acquisition costs.

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

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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&S	-	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

12

SECTION 4 - EFFICIENCY MANITOBA HAS DESIGNED A PLAN BUDGET THAT MAXIMIZES BENEFITS FOR MANITOBANS & THE MANITOBA ECONOMY

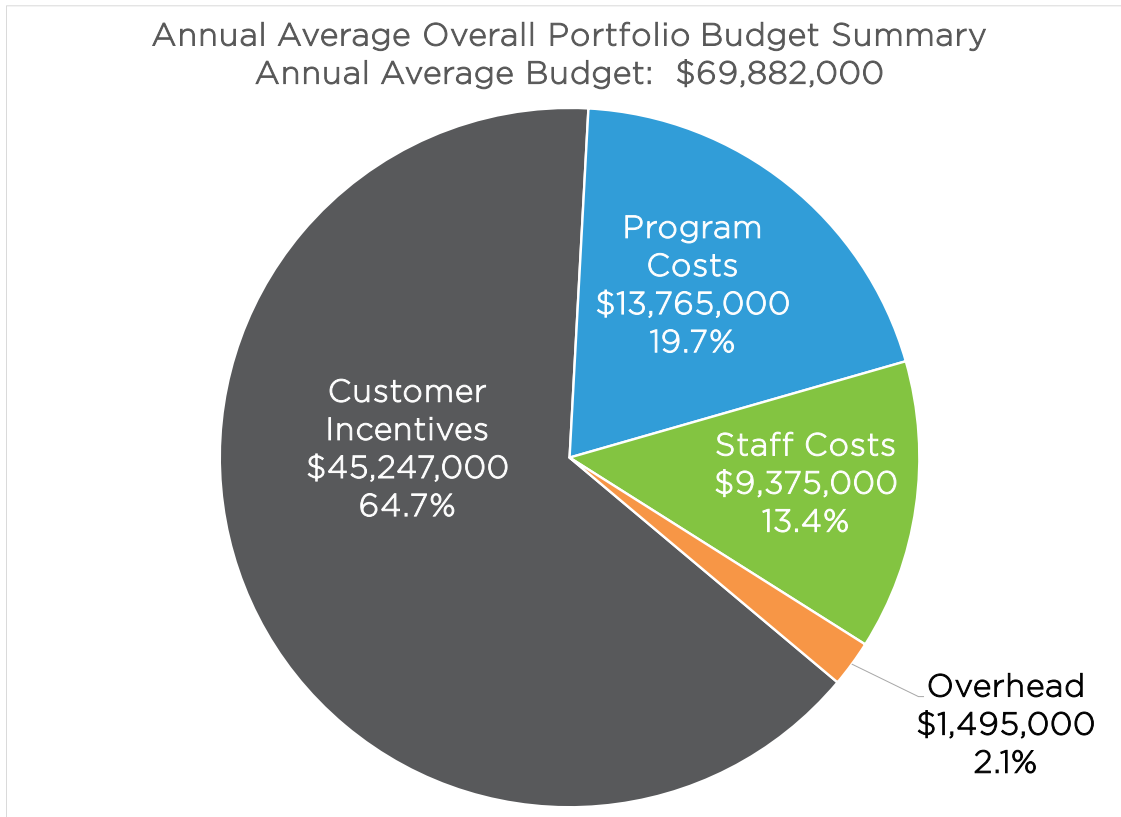
2020/23 EFFICIENCY PLAN SUMMARY - BUDGET

	2020/21	2021/22	2022/23	Average
Electric portfolio	\$44,546,000	\$51,151,000	\$50,984,000	\$48,893,000
Natural gas portfolio	\$18,643,000	\$21,275,000	\$23,047,000	\$20,988,000
Total Budget	\$63,189,000	\$72,426,000	\$74,031,000	\$69,881,000

Note. Currency is expressed in nominal dollars.

4.1 THE PLAN WILL DISTRIBUTE 87% OF THE BUDGET TO MANITOBANS & THE PRIVATE SECTOR

99 Efficiency Manitoba has budgeted an average of \$49 million annually for the electric
 100 portfolio and an average of \$21 million annually for the natural gas portfolio. These
 101 costs are balanced by the benefits provided back to Manitobans, the private sector
 102 and Manitoba Hydro. The following figure shows the overall (both electric and natural
 103 gas) portfolio budget divided by customer incentives, private sector program costs,
 104 Efficiency Manitoba staff and corporate overhead components. The Efficiency
 105 Manitoba staff budget includes both program and corporate overhead labour
 106 components.



Note. Program costs include private sector program delivery, program administration, program advertising and enabling strategies budget items.

107 87 percent of Efficiency Manitoba’s combined budget is returned to Manitobans
108 through program incentives, private sector energy efficiency delivery partners and
109 outsourced corporate support functions. The incentive budget represents 65 percent
110 of the combined portfolio budget. In addition, 20 percent of the overall budget is
111 allocated to private sector program costs while an additional and 2 percent of the
112 overall budget is allocated to securing private industry support services for corporate
113 support components.

REFERENCE:

4-11 and 16 (PDF 108-115 and 120)
Annual Natural Gas and Electric Cost Tables

PREAMBLE TO IR (IF ANY):

QUESTION:

- a) Please provide expanded versions of Tables 4.6 and 4.7 that set out the annual values for 2020/21, 2021/22 and 2022/23.
- b) Please provide the following breakdown of the natural gas and electric budgets for each year in the Plan (i.e., 2020/21, 2021/22 and 2022/23):

	EM Staff		Private Sector		Overall Total
	See Note 1	Total	See Note 2	Total	
One Row for Each Customer Segment/Program Bundle per Attachment 3 Cost Tables					
Enabling Strategies: Program Support and Education					
Enabling Strategies: Innovation, Codes & Standards and Evaluation					
Corporate Overheads					
Total					

Note 1: Provide a separate column for each of the Staff categories in Table 4.7

Note 2: Provide a separate column for each of the Private Sector categories in Tables 4.6 and 4.8.

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- c) If the Overall Total for each Customer Segment/Program Bundle in the table provided in part (a) does not match the costs shown in the Cost Table per Attachment 3 of the Application for each of Natural Gas and Electric, please explain why and reconcile the two values.
- d) Is Manitoba Hydro a recipient of any of the “private sector” sector costs set out in Tables 4.6 or 4.8?
- I. If yes, for what activities is Manitoba Hydro being compensated and what are the total amounts for Natural Gas and Electric for each budget year?

RATIONALE FOR QUESTION:

To better understand the makeup of the proposed portfolio budgets

RESPONSE:

a)

a) Table 4.6 by year

	2020/21	2021/22	2022/23
Electric program delivery	\$3,456,000	\$3,602,000	\$3,872,000
Electric enabling strategies	\$5,039,000	\$5,199,000	\$5,008,000
Electric advertising	\$1,112,000	\$1,187,000	\$1,154,000
Electric program costs (sub-total)	\$9,607,000	\$9,988,000	\$10,034,000
Natural Gas program delivery	\$1,457,000	\$1,586,000	\$1,520,000
Natural gas enabling strategies	\$1,653,000	\$1,691,000	\$1,628,000
Natural gas advertising	\$711,000	\$745,000	\$675,000
Natural gas program costs (subtotal)	\$3,821,000	\$4,022,000	\$3,823,000
Overall program delivery	\$4,913,000	\$5,188,000	\$5,392,000
Overall enabling strategies	\$6,692,000	\$6,890,000	\$6,636,000
Overall advertising	\$1,823,000	\$1,932,000	\$1,829,000
Overall program costs (total)	\$13,428,000	\$14,010,000	\$13,857,000

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Table 4.7 by year

	2020/21	2021/22	2022/23
Electric program design/modelling, admin. And support	\$4,358,000	\$4,498,000	\$4,617,000
Electric enabling strategies	\$1,147,000	\$1,181,000	\$1,200,000
Electric corporate overhead	\$1,050,000	\$1,070,000	\$1,091,000
Electric staff costs (sub-total)	\$6,692,000	\$6,890,000	\$6,636,000
Natural Gas program design, admin. and support	\$1,916,000	\$1,952,000	\$1,953,000
Natural gas enabling strategies	\$333,000	\$339,000	\$346,000
Natural gas corporate overhead	\$350,000	\$357,000	\$364,000
Natural gas staff costs (subtotal)	\$2,599,000	\$2,648,000	\$2,663,000
Overall program design/modelling, admin and support	\$6,274,000	\$6,450,000	\$6,570,000
Overall enabling strategies	\$1,480,000	\$1,520,000	\$1,546,000
Overall corporate overhead	\$1,537,000	\$1,568,000	\$1,183,000
Overall staff costs (total)	\$9,291,000	\$9,538,000	\$9,299,000

- b) Requested tables can be found in COALITION/EM I-39 and COALITION/EM I-44
- i. Program Delivery / Advertising / Incentives do not include Efficiency Manitoba Staff Costs (see COALITION/EM I-39).
 - ii. Program design/modeling/admin/support all Efficiency Manitoba Staff Costs (COALITION/EM I-39).
 - iii. Enabling Strategies Efficiency Manitoba Staff Costs are detailed in COALITION/EM I-44.
 - iv. Overhead costs are provided in part a) above.

- c) Tables all reconcile.

- d) Manitoba Hydro is not expected to be the recipient of any of the private sector cost set out in Table 4.6 or Table 4.8.

REFERENCE:

Efficiency Plan p.22 of 591

PREAMBLE TO IR (IF ANY):**QUESTION:**

For each budget category shown in the pie chart on page 22 (except Customer Incentives), provide a breakdown of dollars and percentage of total budget that are related to:

- (i) Manitoba-based private companies
- (ii) Non-Manitoba base private companies
- (iii) Manitoba-based non-governmental organizations
- (iv) Non-Manitoba-based non-governmental organizations
- (v) Manitoba-based Crown Corporations
- (vi) Non-Manitoba-based Crown Corporations

RATIONALE FOR QUESTION:**RESPONSE:**

The budget categories in the pie chart on page 22 of 591 (expect Customer Incentives) are as follows:

Program Costs \$13.765 million

Staff Costs \$9.375 million

Overhead \$1.495 million

For each of these categories, the following has been contemplated as far as distribution to the types of companies referenced above:

Program costs:

The Efficiency Manitoba budget did not contemplate which type of company would be related to the program costs. Given that the services to deliver on these programs have not yet been

procured, an assessment of the type and location of companies that will be providing the service cannot be made at this time.

Staff Costs:

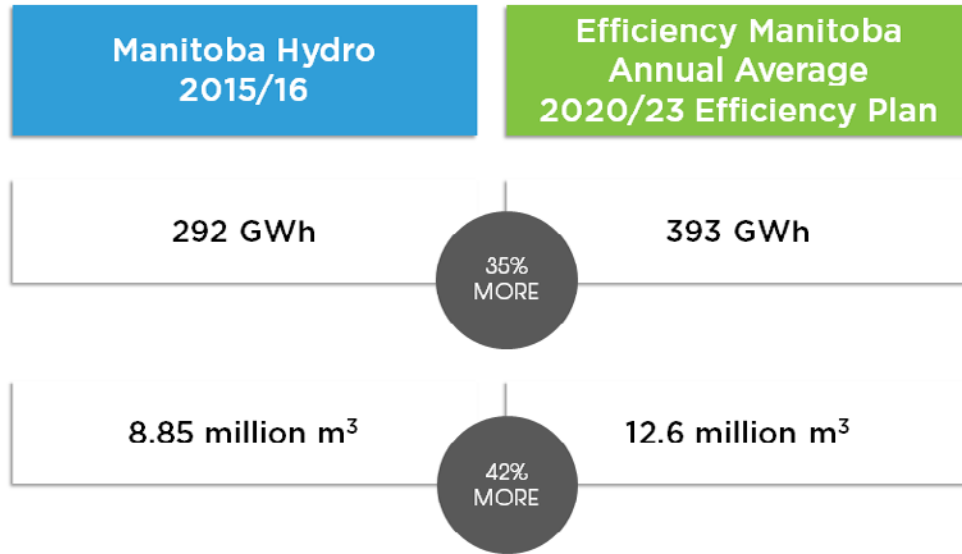
The staff costs included in the budget relate to employees who will be directly employed by Efficiency Manitoba, therefore will relate to individuals and employee benefit providers.

Overhead:

Similar to program costs, overhead costs will be awarded upon the approval of the Plan and an assessment of the type and location of companies that will be providing the service cannot be made at this time.

The procurement process is underway in anticipation of the April 1, 2020 commencement date. Apart from staff costs, Efficiency Manitoba expects that the majority of program and overhead costs will be related to Manitoba and non-Manitoba based private companies.

5.7 THE PLAN ACHIEVES ADDITIONAL ELECTRIC ENERGY SAVINGS OF 35% & NATURAL GAS ENERGY SAVINGS OF 42% WHEN COMPARED TO PRIOR EFFICIENCY PLANS



200 A direct and equitable comparison of the Plan savings and investment to prior
201 Manitoba Hydro DSM plans is not possible as there are many differences with respect
202 to scope, investment items included, and targeted energy savings. However,
203 Efficiency Manitoba has endeavored to provide an analysis to reconcile the
204 differences between its Plan and prior Manitoba Hydro DSM plans in order to provide
205 the best available information to the PUB, with the overall portfolio budget
206 comparison as follows:

Manitoba Hydro 2015/16		Efficiency Manitoba Annual Average 2020/23 Efficiency Plan	
\$49,329,000	INCENTIVE COSTS	\$45,247,000	8% ↓
\$9,927,000	PROGRAM COSTS	\$13,765,000	39% ↑
\$14,949,000	STAFF COSTS	\$9,375,000	37% ↓
\$2,190,000	OVERHEAD COSTS	\$1,495,000	32% ↓
\$76,396,000	TOTAL COSTS	\$69,881,000	9% ↓

SECTION 6 - EFFICIENCY MANITOBA HAS AN INCLUSIVE & DIVERSE PORTFOLIO THAT PROVIDES ADDITIONAL NON-ENERGY BENEFITS TO MANITOBANS

6.1 THE DESIGN OF THE PLAN PROVIDES FOR AN INCLUSIVE & DIVERSE PORTFOLIO OF EFFICIENCY PROGRAMS THAT CONSIDERS ALL CUSTOMER SEGMENTS

207 The Plan verifies that Efficiency Manitoba can achieve the mandated electric and
 208 natural gas savings targets along with any resulting reductions in greenhouse gas
 209 emissions (GHG) and other non-energy benefits in a manner that reaches all
 210 Manitobans.

REFERENCE:

Efficiency Plan p.21, 148-150, 161-162, 165-166, of 591

PREAMBLE TO IR (IF ANY):

QUESTION:

- a. In a table, compare the Plan spending totals on electricity programs with the forecasted and actual spending for 2015/16, 2016/17, and 2017/18, broken down by customer segment. For each prior forecast year, use the Manitoba Hydro Power Smart Plan with the most recent forecast for that year. Present the response in a table similar to the one below:

Spending	Efficiency Manitoba Plan	2015/16		2016/17		2017/18	
		Average	Forecast	Actual	Forecast	Actual	Forecast
Residential (excl. AEP)							
AEP/Income Qualified/Indigenous							
Commercial (incl. Agricultural)							
Industrial							
Emerging Technology							
Total							

- b. Provide a table similar to (a) for gas programs.

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- c. In a table similar to (a), compare the Plan savings totals from electricity programs with the forecasted and actual savings for 2015/16, 2016/17, and 2017/18, broken down by customer segment.
- d. Provide a table similar to (c) for gas programs.

RATIONALE FOR QUESTION:**RESPONSE:**

While preparing the response to this interrogatory, Efficiency Manitoba identified a data input error. This resulted in an overstatement of electric energy savings from residential general service lighting standards of 43 GWh over the three years of the Plan. The revised electric energy savings in the 3-year Plan represent an average of 1.46% of the electric load. Efficiency Manitoba is confident that the flexibility of the Plan will allow for modifications to the offerings to enable the achievement of the 1.5% target.

This revision impacts the response to PUB/EM I-39 and the electric energy savings in Attachment 3. Please see the revised response to PUB/EM I-39 for the updated information.

- a) The following table compares the 3-year average electric budget for the Plan to the forecast and actual electric spending from the 2015/16, 2016/17 and 2017/18 Manitoba Hydro DSM plans.

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Electric Costs (millions \$\$'s)	Efficiency Manitoba Plan	2015/16		2016/17		2017/18	
	3-yr Average	Forecast	Actual	Forecast	Actual	Forecast	Actual
Residential (excl. AEP)	\$ 8.2	\$ 11.7	\$ 8.0	\$ 10.4	\$ 9.9	\$ 10.2	\$ 9.0
AEP/Income Qualified/ Indigenous	\$ 2.7	\$ 1.4	\$ 2.4	\$ 2.1	\$ 2.5	\$ 1.6	\$ 2.7
Commercial (incl. Agricultural)	\$ 19.0	\$ 27.8	\$ 27.5	\$ 26.2	\$ 23.2	\$ 25.1	\$ 35.0
Industrial*	\$ 9.9	\$ 17.5	\$ 13.7	\$ 14.2	\$ 11.5	\$ 16.5	\$ 9.5
Emerging Technology	\$ 0.6	\$ -	\$ -	\$ 0.0	\$ -	\$ 0.9	\$ 4.7
Program Support/Enabling Strategies	\$ 8.5	\$ 4.9	\$ 3.8	\$ 4.2	\$ 4.3	\$ 4.0	\$ 3.3
Total	\$ 48.9	\$ 63.3	\$ 55.4	\$ 57.1	\$ 51.4	\$ 58.3	\$ 64.4

Note: May not add up due to rounding.

* 2015/16 to 2017/18 information includes budget and actual spending for Customer-Sited Load Displacement, Bioenergy Optimization and Curtailable Rates.

- b) The following table compares the 3-year average natural gas budget for the Plan to the forecast and actual natural gas spending from the 2015/16, 2016/17 and 2017/18 Manitoba Hydro DSM plans.

Natural Gas Costs (millions \$\$'s)	Efficiency Manitoba Plan	2015/16		2016/17		2017/18	
	3-yr Average	Forecast	Actual	Forecast	Actual	Forecast	Actual
Residential (excl. AEP)	\$ 4.3	\$ 5.1	\$ 1.6	\$ 3.6	\$ 2.2	\$ 2.5	\$ 1.9
AEP/Income Qualified/ Indigenous	\$ 6.5	\$ 4.0	\$ 5.4	\$ 6.3	\$ 5.0	\$ 5.2	\$ 5.2
Commercial (incl. Agricultural)	\$ 5.5	\$ 5.0	\$ 5.2	\$ 4.9	\$ 4.2	\$ 4.0	\$ 4.8
Industrial	\$ 1.8	\$ 0.5	\$ 0.6	\$ 0.5	\$ 0.7	\$ 1.0	\$ 0.6
Emerging Technology	\$ 0.1	\$ -	\$ -	\$ 0.0	\$ -	\$ -	\$ -
Program Support/Enabling Strategies	\$ 2.7	\$ 1.0	\$ 1.2	\$ 1.0	\$ 1.1	\$ 0.8	\$ 1.0
Total	\$ 20.9	\$ 15.6	\$ 13.9	\$ 16.3	\$ 13.2	\$ 13.5	\$ 13.5

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- c) The following table compares the 3-year average forecast electric energy savings from the Plan to the forecast and actual electric energy savings from the 2015/16, 2016/17 and 2017/18 Manitoba Hydro DSM plans.

Electric Savings (GWh)	Efficiency Manitoba Plan	2015/16		2016/17		2017/18	
	3-yr Average	Forecast	Actual	Forecast	Actual	Forecast	Actual
Residential (excl. AEP)	23	44	36	48	54	42	55
AEP/Income Qualified/ Indigenous	5	6	5	3	6	3	5
Commercial (incl. Agricultural)	109	89	96	92	103	98	140
Industrial*	154	78	140	141	124	94	136
Emerging Technology	2	-	-	-	-	1	6
Codes & Standards	85	75	50	74	60	72	60
Total	378	292	326	359	347	310	403

Note: May not add up due to rounding.

* 2015/16 to 2017/18 information includes forecast and actual energy savings for Customer-Sited Load Displacement and Bioenergy Optimization.

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- d) The following table compares the 3-year average forecast natural gas savings from the Plan to the forecast and actual natural gas savings from the 2015/16, 2016/17 and 2017/18 Manitoba Hydro DSM plans.

Natural Gas Savings (million m ³)	Efficiency Manitoba Plan 3-yr Average	2015/16		2016/17		2017/18	
		Forecast	Actual	Forecast	Actual	Forecast	Actual
Residential (excl. AEP)	1.7	1.8	1.5	2.1	2.3	2.0	1.8
AEP/Income Qualified/ Indigenous	1.2	1.4	1.2	1.3	1.0	0.9	1.1
Commercial (incl. Agricultural)	3.3	3.2	4.3	3.5	2.9	3.4	2.2
Industrial	4.2	1.0	0.5	1.0	1.0	2.5	1.6
Emerging Technology	0.1	-	-	-	-	-	-
Codes & Standards	4.0	3.4	2.8	4.3	3.0	3.6	3.0
Interactive Effects	(1.9)	(1.9)	(1.3)	(3.5)	(5.0)	(3.0)	(4.0)
Total	12.6	8.9	8.9	8.8	5.2	9.4	5.7

Note: May not add up due to rounding.

REFERENCE:

Section 3.3 Comprehensive Engagement, PDF page 90, lines 234-238, and Section 4, PDF page 106, lines 12-16.

PREAMBLE TO IR (IF ANY):

The report emphasizes in both Section 3.3 and Section 4 that it is critical to engage with delivery partners -- including suppliers, contractors, installers, and service providers -- essentially, the businesses that are directly responsible for delivering energy efficient products and services into homes, commercial operations, and industrial businesses -- for program design decisions including incentive structures and implementation strategies, and that it relies on continuity of programs for Manitoba customers and stability for service providers and delivery partners to meet the mandated targets within the first three years of the plan.

QUESTION:

- a) Please provide a list of these critical service providers and delivery partners who will be relied upon to meet mandated annual targets, showing which will be relied on for electric versus natural gas measures and which are new or existing providers.
- b) Please provide any estimates of additional partners by type that Efficiency Manitoba will be seeking.
- c) Also, please provide a timeframe for onboarding new partners to the program.
- d) Please provide a table that shows the total assumed number of participants for each natural gas efficiency measure by customer class and by year over the life of each measure and explain how this participation level is determined.
- e) Please indicate which program delivery partners will be responsible for converting these target customers to participants in each year.
- f) Please explain how Efficiency Manitoba derived what it considers to be the appropriate incentive level to convert these customers to participants, and how this incentive level differs by customer class.

RATIONALE FOR QUESTION:

Determine the pace at which Efficiency Manitoba will be able meet the mandated targets for the first year of the plan.

RESPONSE:

- a) Delivery partners will include contractors, retailers, installers, distributors, wholesalers, service professionals, and procured third-party contractors and service providers. Specific parties have not yet been onboarded by Efficiency Manitoba therefore a list is not available at this time. Providers may be responsible for electric or natural gas measures or both, depending on their type of business. They may be new to offering DSM programming or may have previously participated in Manitoba Hydro's energy efficiency programs.
- b) Efficiency Manitoba will need to recruit service providers and delivery partners to deliver programs starting April 1, 2020 and beyond. The following are estimates of the service providers Efficiency Manitoba will be seeking along with the estimated timeframe for onboarding of these new service providers.

Service Provider Description	Timeframe for onboarding new service provider
<p>Home Renovation Program</p> <p>1) Energy Audit Service providers – service providers will be needed to conduct the home energy audits under the Home Renovation Program. These providers will conduct pre and post home energy audits for residential customers participating in the Home Renovation Program.</p> <p>2) Verification Service Provider - A service provider will be needed to conduct pre and post install verifications for insulation and window/door upgrades.</p>	<p>Energy Audit providers – Fall/Winter 2020</p> <p>Verification provider – Early 2020</p>
<p>New Homes and Major Renovation Programs</p> <p>3) Certified Service Organization delivering EnerGuide - a service provider with a Service Organization (SO) designation from</p>	<p>New Homes provider – Early 2020</p>

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<p>Natural Resources Canada, qualified to conduct energy modelling, deliver EnerGuide pre-and post-assessments and issue ratings in the province of Manitoba via a staff of Certified Energy Advisors.</p>	<p>Major Renovation provider - Fall/Winter 2020</p>
<p>Product Rebates</p> <p>4) Retail and Online Rebates service provider – A service provider will coordinate and secure contractual agreements with retailers, build/maintain the program’s online application form and process customer inquiries/incentives.</p> <p>5) Appliance Recycling Program service provider – A provider will maintain a phone line and website to accept customer enrollments, remove appliances from customer homes, manage the disposal and recycling of appliances, issue incentives to customers, and handle customer inquiries, issues, and complaints.</p>	<p>Retail and Online Rebates provider – Procured October 2019</p> <p>Appliance Recycling provider – Early 2020</p>
<p>Manitoba Race to Reduce</p> <p>6) Program delivery agent – Manitoba Race to Reduce will be delivered by a 3rd party delivery agency specializing in customer outreach programming that focuses heavily on outward communication, event management/execution, social media, customer data analysis, and expertise with energy benchmarking tools (notably Portfolio Manager).</p>	<p>Delivery agent - Summer 2021</p>
<p>Income Qualified Offers</p> <p>7) Home Energy Check-up Service Providers – service providers to perform a home energy assessment for all income qualified participants under the Income Qualified Program, conducting a review of the home for current insulation levels, details on current heating source, and current inventories and potential for other energy saving devices.</p> <p>8) Verification/Post Inspection Service Provider - A service provider will be needed to conduct post inspections of installed</p>	<p>Home Check-up provider -Early 2020</p> <p>Verification provider - Early 2020</p>

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<p>energy efficiency upgrades.</p> <p>9) Appliances Service Provider – a service provider to supply and install a front load clothes washer for eligible income qualified participants.</p> <p>10) Smart Thermostat Service Provider – a service provider to supply and install a smart thermostat to eligible income qualified participants.</p> <p>11) Insulation Contractors – Multiple contractors to supply and install eligible insulation upgrades for eligible customers.</p> <p>12) Furnace Contractors - Multiple contractors to supply and install high efficiency furnaces for eligible customers.</p> <p>13) Decluttering/Moving Service provider – a service provider to provide assistance moving and/or removing household items to prepare the space for upgrades that otherwise would not get completed.</p> <p>14) Energy and Water Saving Devices Service Provider – a service provider to supply and distribute water and energy saving devices for provision and installation at the time of the Home Energy Checkup, and the provision and direct install for MURB customers</p>	<p>Appliance provider - Spring 2021</p> <p>Thermostat provider - Spring 2021</p> <p>Insulation contractors - Spring 2020</p> <p>Furnace contractors - Spring 2020</p> <p>Moving provider - Fall 2020</p> <p>Devices provider - Spring 2020</p>
<p>Small Business Program</p> <p>15) Delivery Service Provider -The service provider will be required to go door-to-door offering the Small Business Program to eligible customers; install direct install items such as aerators, spray valves, showerheads, and A-line LED bulbs; conduct a lighting assessment of the business; and coordinate the product and scheduling of deeper retrofits with local electricians.</p>	<p>Delivery provider - Early 2020</p>
<p>Metis Income Qualified Offers</p>	

<p>16) Home Energy Check-up Service Providers – service providers to perform a home energy assessment for all Metis income qualified participants under the Metis Income Qualified Program, conducting a review of the home for current insulation levels, details on current heating source, and current inventories and potential for other energy saving devices.</p> <p>17) Verification/Post Inspection Service Provider - A service provider will be needed to conduct post inspections of installed energy efficiency upgrade.</p> <p>18) Energy and Water Saving Devices Service Provider – a service provider to supply and distribute water and energy saving devices for provision and installation at the time of the Home Energy Checkup.</p> <p>19) Appliances Service Provider – a service provider to supply and install a front load clothes washer for eligible Metis income qualified participants.</p> <p>20) Smart Thermostat Service Provider – a service provider to supply and install a smart thermostat for eligible Metis income qualified participants.</p> <p>21) Insulation Contractors – Multiple contractors to supply and install eligible insulation upgrades to eligible Metis income qualified customers. Work with Manitoba Metis Federation for sourcing.</p> <p>22) Furnace Contractors - Multiple contractors to supply and install high efficiency furnaces for eligible Metis income customers. Work with Manitoba Metis Federation for sourcing.</p>	<p>Home Check-up provider - Early 2020</p> <p>Verification provider - Early 2020</p> <p>Devices provider - Spring 2020</p> <p>Appliance provider - Spring 2021</p> <p>Thermostat provider - Spring 2021</p> <p>Insulation contractors - Spring 2020</p> <p>Furnace contractors - Spring 2020</p>
<p>Indigenous Small Business Program</p> <p>23) Delivery provider - A service provider will be required to go door-to-door offering the Small Business Program to eligible</p>	<p>Delivery provider - Early 2020</p>

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customers; install direct install items such as aerators, spray valves, showerheads, and A-line LED bulbs; conduct a lighting assessment of the business; and coordinate the product and scheduling of deeper retrofits with local electricians.	
First Nation Insulation and Direct Install 24) Appliances Service Provider – a service provider to supply and install a front load clothes washer for participants. 25) Smart Thermostat Service Provider – a service provider to supply and install a smart thermostat to eligible participants. 26) Energy and Water Saving Devices Service Provider - a service provider to supply and distribute water and energy saving devices and LEDs.	Appliance provider - Spring 2021 Thermostat provider - Spring 2021 Devices provider - Spring 2020
Home Energy Efficiency Kits and Education 27) Energy Efficient Products – A service provider will be required to supply energy efficient products provided through the Home Energy Efficiency Kits and Education offer.	Products provider- Spring 2020
Home Check Up 28) Energy Efficient Products provider – A service provider will be required to supply energy efficient products provided through the Home Check Up offer. 29) Installation Services provider – a service provider will be required to install eligible energy efficient products in participating customer’s homes. 30) Online questionnaire service provider – A service provider will be required to develop and implement an online energy efficiency questionnaire.	Products provider - Spring 2020 Install provider - Spring 2020 Online Questionnaire provider – Fall 2020
In-Suite Efficiency 31) Energy Efficient Products – A service provider will be required to supply energy efficient products provided through the In-	Products provider - Spring 2020

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<p>Suite Efficiency offer. 32) Installation Services – a service provider will be required to install eligible energy efficient products in participating suites.</p>	<p>Install Provider - Spring 2020</p>
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- c) Efficiency Manitoba has been collecting contact information for businesses interested in offering energy efficiency programs to their customers since the Spring of 2019. In early 2020, Efficiency Manitoba plans to communicate with these businesses as well as Manitoba Hydro’s active participating program suppliers inviting them to sign a participating supplier agreement with Efficiency Manitoba. This will not be a limited time sign-up as new delivery partners will be able to register with Efficiency Manitoba at any time. Efficiency Manitoba will be in regular communication with these contacts as well as various industry associations providing them with updates and program materials as commencements of programs get closer.

Service provider procurement has been initiated and will be ongoing. Manitoba Hydro’s existing program delivery contracts have transferability clauses related to Efficiency Manitoba that can be executed as needed. Several new initiatives are planned for commencement in years two and three of the plan to allow time for program planning, including the procurement of service providers.

The timeframe for onboarding new service providers is included in the chart (above) in response to DAYMARK/EM I-13 b.

- d) Please see the attached table for the response to this question.

Columns E through G include the assumed natural gas participation by measure for each year the technology is included in the plan along with a description of how this participation level is determined. Technologies with an N/A in the natural gas participation columns are technologies with electric savings only.

- e) Please see the attached table for the response to this question.

Outlined in column D are the program delivery partners that will be relied upon to convert these target customers to participants in each year.

- f) Please see the response to DAYMARK/EM I-77.

REFERENCE:

Section 2, pdf page 51 of 591, Line 51 – 52.

PREAMBLE TO IR (IF ANY):

Efficiency Manitoba is budgeted to have up to 75 full-time equivalent staff inclusive of all the activities within the Plan.

QUESTION:

- a) What is the full-time equivalent staff count of Efficiency Manitoba as of November 8, 2019?
- b) Is Efficiency Manitoba planning to have all 75 full-time equivalent staffs by April 1, 2020 that is prior to the launch of 2020/21 Efficiency Plan?
- c) If yes, please discuss Efficiency Manitoba's plan from now to April 1, 2020 regarding hiring 75 full-time equivalent staffs.
- d) If no, please discuss what staffing level is Efficiency Manitoba is planning to reach by April 1, 2020 Further, please discuss why this level of staff is sufficient

RATIONALE FOR QUESTION:

To assess reasonable expectation that the Efficiency Manitoba will deliver net savings mandated by the Regulation.

RESPONSE:

- a) On November 8, 2019, Efficiency Manitoba had 5 full-time equivalent staff.
- b) Efficiency Manitoba is working through its implementation plan including organization structure to ensure staffing levels are adequate to deliver on the Plan. Being fully operational has assumed that required staff will be employees of Efficiency Manitoba by April 1, 2020.

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- c) There are labour and employee relations dimensions of Efficiency Manitoba's requirements to staff the organization which require coordination with Manitoba Hydro as the current employer of energy efficiency staff. In addition, bargaining units currently represent a portion of employees doing this work. Efficiency Manitoba has held introductory meetings with the bargaining units and is in contact with Manitoba Hydro. The process of confirming Efficiency Manitoba's requirements and planning for the transition strategy is ongoing. Efficiency Manitoba is planning to make offers of employment and post positions where applicable prior to its April 1, 2020 commencement date.
- d) It is not anticipated that Efficiency Manitoba will be operating with insufficient staff levels on April 1, 2020.

REFERENCE:

Efficiency Plan p.189, 427 of 591

PREAMBLE TO IR (IF ANY):

“Efficiency Manitoba has budgeted for an innovation and research fund that will drive activity in pilot projects and partnerships in research.”

QUESTION:

- a. Identify the parties that Efficiency Manitoba anticipates providing external funding to through research partnerships.
- b. Provide the annual funding forecasted by Efficiency Manitoba for the innovation budget separately by pilot projects and research partnerships for each year of the Plan and identify which cost category this funding is from (e.g. program costs, staff costs, overhead costs).

RATIONALE FOR QUESTION:**RESPONSE:**

- a. Efficiency Manitoba has established a budget for innovation and research but the strategy for deploying those funds has not yet been finalized.
- b. As per PUB/EM – 18 a), the strategy for the innovation budget has not yet been finalized and therefore there are no specific pilots nor research partnerships which have had funding allocated.

13

163 Strategies budget. This will support the achievement of longer-term energy savings
 164 by establishing pilot programs and projects to evaluate new technologies,
 165 approaches, customer services or completing market analysis. Table 7.4 shows the
 166 proposed budget for each of the three years in the Plan. Efficiency Manitoba will
 167 pursue partnerships with the research industry, leveraging these funds to complete
 168 mutually beneficial research projects and encourage further innovation within the
 169 energy efficiency industry in Manitoba. Specific activities may also include the funding
 170 of demonstrations or pilot projects. Also included within the 2020/21 and 2021/22
 171 fiscal years is budget to hire a service provider to complete a DSM market potential
 172 study. These studies are used to identify the technical, economic and achievable
 173 energy efficiency savings potential within a jurisdiction.

TABLE 7.4 ANNUAL INNOVATION BUDGET WITHIN ENABLING STRATEGIES

	2020/21	2021/22	2022/23
Innovation budget	\$950,000	\$968,000	\$727,000

Note. Currency is expressed in nominal dollars.

7.4.1 CONTINGENCY

174 Section 9(l)(iii) of the Act identifies Efficiency Manitoba may budget for a
 175 contingency fund for the explicit purpose of pursuing unanticipated DSM
 176 opportunities. If an unanticipated energy efficiency opportunity emerges within the
 177 Plan years, there are alternatives Efficiency Manitoba may pursue. For example, for
 178 opportunities within the proposed electric or natural gas portfolio that would not
 179 increase overall electric or natural budgets and would still achieve energy savings
 180 targets, Efficiency Manitoba could simply pursue that opportunity through rapid

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181 actions to best leverage any unique savings or other opportunities that cannot be
182 accommodated within the existing Plan.

183 If an unanticipated DSM opportunity arises during the Plan years which would impact
184 overall budget, Efficiency Manitoba has developed a contingency process to
185 communicate, vet and obtain approval to pursue within certain restrictions (further
186 outlined below). Unanticipated DSM opportunities, if they were to arise, would more
187 likely materialize within the 2021/22 or 2022/23 fiscal years. It is therefore possible
188 that such opportunities would simply be reflected within the subsequent 2023/26
189 Efficiency Plan. Correspondingly, Efficiency Manitoba has assumed that assigning 10
190 percent of the overall annual average budget, or an overall cap of \$7 million across all
191 three Plan years will sufficiently address this risk. This contingency budget has not
192 been included within the overall portfolio budget or cost-effectiveness analysis
193 included within the Plan.

194 Although unanticipated, DSM opportunities which may benefit from the use of the
195 contingency in order to acquire time sensitive and cost-effective energy savings to
196 count against achievement of the mandated cumulative electric or natural gas energy
197 savings targets include the following:

- 198 • adding a new energy efficiency measure or program which is not included
199 within the Plan that has realized very rapid changes in capital cost which allow
200 a rapid market entry and cost-effective attainment of associated energy
201 savings. This specific scenario was previously encountered with LED lighting
202 technology where purchase price dropped over a short period of time; and

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203 • pursuing energy efficiency opportunities through an unanticipated large
204 commercial, industrial or agricultural facility expansion, upgrade or economic
205 development project. Large capital projects within these customer segments
206 have the potential to offer a time-sensitive opportunity to capture large energy
207 savings towards attainment of future targets with a comparatively low
208 acquisition cost. Additionally, Efficiency Manitoba recognizes that its offerings
209 can help influence these critical economic development decisions in the
210 province.

211 In the event Efficiency Manitoba encounters such events that lead to the development
212 and proposed use of this contingency Efficiency Manitoba proposes the following
213 process to obtain approval for such changes:

- 214 • Efficiency Manitoba to discuss the proposed use of contingency with the
215 Energy Efficiency Advisory Group;
- 216 • Efficiency Manitoba to prepare a summary of the energy savings, budget, and
217 cost effectiveness implication of the project or DSM initiative as a stand-alone
218 action;
- 219 • Efficiency Manitoba to seek Efficiency Manitoba Board approval for the change
220 including a review of the risks associated with inaction;
- 221 • Pending Efficiency Manitoba Board approval, Efficiency Manitoba to review the
222 proposed revised budget schedule with Manitoba Hydro;
- 223 • Pending Efficiency Manitoba Board approval:

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- 224 • Efficiency Manitoba will include description and analysis of the use of the
225 contingency within public annual reporting required under both the
226 Crown Corporations Governance and Accountability Act (CCGAA) and
227 the Act; and
- 228 • Efficiency Manitoba will include description and analysis of any
229 contingency use within the subsequent PUB hearing process as part of
230 Efficiency Manitoba's retrospective performance assessment. This may
231 involve sharing information with the PUB on a confidential basis
232 recognizing any commercially sensitive customer information that may
233 have been shared with Efficiency Manitoba in the process determining
234 the use of the contingency fund.

REFERENCE:

32 (PDF 42)
Annual Natural Gas and Electric Cost Tables

PREAMBLE TO IR (IF ANY):

Section 1 (page 32) states:

“Efficiency Manitoba has identified a three-year contingency fund for the explicit purpose of pursuing unanticipated DSM opportunities.”

QUESTION:

- a) What are the contingency fund amounts included in the Natural Gas and Electric portfolio budgets for each of the three years?
- b) Where in the Cost Tables provided in Attachment 3 are these funds included?

RATIONALE FOR QUESTION:

To better understand Efficiency Manitoba’s proposed Contingency Fund.

RESPONSE:

- a) Contingency Fund amounts have not been included in the Natural Gas or Electric portfolio budgets in any of the three years. Section 7.4.1 of the Plan (PDF page 189 of 591) outlines the process for getting approval for use of the Contingency Fund, if necessary. Efficiency Manitoba has capped the potential for use of a Contingency Fund at \$7 million over the three years of the Plan.
- b) As noted above, the Contingency Fund is not included in the budget. As per Section 9 (l) (iii) of the Efficiency Manitoba Act, the establishment of a Contingency Fund is to be used to enable Efficiency Manitoba to take advantage of emerging opportunities that are not otherwise addressed in the plan which provides Efficiency Manitoba with important flexibility to pursue cost effective energy savings opportunities to meet

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legislated targets. As these emerging opportunities are not identified, they do not have associated budgets or savings attributed to them. Efficiency Manitoba has not applied contingency costs against the overall portfolio given these unknowns.

Unlike savings targets for the Commercial and Residential sectors, which rely extensively on Codes and Standards savings for achievement of their targets, Industrial sector programs rely exclusively on incentive-based programming for achievement of their targets.

In spite of this more aggressive approach, industrial savings are anticipated to provide about 40% of total electric savings under the Plan while 20% of the total electric portfolio budget.

When compared on this basis, Commercial programs rely on incentive-based programming for savings totaling about 1.35% of the reference load, while Residential programs rely on incentive-based programming for savings totaling only 0.30% of reference load.

1.2.4 – Acquisition Costs (Section 3.2)

Industrial program savings are generally lower cost than savings obtained from incentive-based programs in other sectors. Comparing first-year acquisition costs for incentive-based programs reveals that industrial programs have acquisition costs that are about 1/3 of Commercial incentive-based programs and 1/5 of Residential sector incentive-based programs.

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.

Despite this treatment, industrial programs still maintain low PACT levelized costs, ranging from about 1.15 – 1.66 cents per kWh for program options providing more than 95% of total industrial savings.

1.2.5 Timing and Flexibility (Sections 2.3 & 2.4)

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.

While energy efficiency can provide an important cost advantage, energy costs as a percentage of overall operating costs vary considerably between industrial operations. In general, energy efficiency improvements by themselves do not provide sufficient return on investment to dictate the timeline or approval for capital intensive projects when other factors such as downtime and lost production are considered. Capturing cost-effective savings requires Efficiency Manitoba industrial programming to be readily accessible when customer timelines provide an opportunity for energy efficiency improvements.

1.2.6 Maximizing Cost-Effective Industrial Program Savings (Section 2.4)

Efficiency Manitoba may not have paid enough attention to maximizing industrial uptake. The incentive structure used in its industrial programs limits incentives to no more than 50% of project

2.4 WHY EFFICIENCY MANITOBA SHOULD KEEP FLEXIBILITY TO SPEND EXTRA TO EXCEED TARGETS SOME YEARS

As outlined previously, energy efficiency alone is often not a top priority for establishing investment priorities or justifying capital expenditures, making it difficult to establish concise three-year plans for capturing potential efficiency improvements in industry. Energy efficiency mandates by government will not advance industrial sector participation if available resources and levels of support do not meet customer-mandated criteria for justifying significant direct investments in energy efficiency improvements. **Programming must be ready and easily accessible when the customer is ready to move forward with a project.**

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. Conversely, it may also result in lower spending and lesser savings in periods when opportunities are limited by the timing of industry projects. Mandating the achievement of annual targets, potentially limits the flexibility of Efficiency Manitoba to respond to cost-effective projects and may reduce the cost-effectiveness of the Crown Corporation's resource acquisition by forcing programs with high acquisition costs to be implemented. The resulting reductions in cost-effectiveness and implementation of programming with higher rate impacts create unnecessary hardship for all ratepayers.

2.4.1 Project Spending Caps

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. Achieving higher penetration rates for efficiency improvements may be challenging when imposed incentive caps limit opportunities for industry participation. Many industrial measures have low acquisitions costs, which can boost energy savings in a cost-effective manner when effectively targeted. Investment criteria within industry can vary dramatically from industry to industry depending on market conditions, access to capital and other considerations. Entry level programming with higher incentives for cost-effective projects can also introduce industrial customers to further opportunities for energy efficiency improvements that require larger financial commitments.

2.4.2 Capturing Cost-Effective Savings

The best opportunities for incremental energy-saving improvements generally occur when investments are being made for production-related reasons (i.e. production expansion, infrastructure replacement, and maintenance and reliability). It therefore becomes vitally important for Efficiency Manitoba programs to be responsive to the timing of major capital investments by MIPUG members and other industrial consumers. Efficiency improvements can

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REFERENCE:

4-5 (PDF 129-130)
13 (PDF 117)
Annual Natural Gas and Electric Cost Tables

PREAMBLE TO IR (IF ANY):

QUESTION:

- a) Please provide the following breakdown of the natural gas and electric budgets for each year in the Plan (i.e., 2020/21, 2021/22 and 2022/23):

	See Note 1	Total
One Row for Each Customer Segment/Program Bundle per Attachment 3 Cost Tables		
Sub-Total – Program Total		
Enabling Strategies: Program Support and Education		
Enabling Strategies: Innovation, Codes & Standards and Evaluation		
Corporate Overheads		
Overall Total		

Note 1: Include one column for each of: Program Delivery, Program Design, Advertising, Program Administration, Incentives, Enabling Strategies and Corporate Overhead per the categories set out in Table 5.1. Also include a sub-total for the following items: Delivery, Program Design, Advertising, Program Administration, and Incentives.

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- b) If the sub-totals for each Customer Segment/Program Bundle in the Table provide in response to part (a) per Note 1 do not match the costs shown in the Cost Table per Attachment 3 of the Application for each of Natural Gas and Electric, please explain why and reconcile the two values.
- c) Is there a difference between: i) the activities and costs captured under Program Design, Modelling, Management, Administration, Technical Support and Customer Support as described in Section 4 (page 13) and ii) the activities and costs capture under Program Design and Program Administration activities in Section 5 (Table 5.1)
 - I. If yes, please explain the difference and reconcile the overall costs reported for each.
- d) Where are the cost of Program Advertising for specific programs (as described in Section 4, page 15) captured in the Table provided in response to part (a)?
 - I. If not included in the response to part (a), please explain where these costs are capture in the overall Natural Gas and Electric portfolio budgets.

RATIONALE FOR QUESTION:

To better understand the makeup of the proposed portfolio budgets.

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RESPONSE:

a) Please see the following tables:

		Annual Electric Incentive Costs (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install	\$264	\$407	\$554	\$408
	Product Rebates	\$1,940	\$1,623	\$1,202	\$1,588
	Home Renovation	\$775	\$1,831	\$1,888	\$1,498
	New Homes & Major Renovation	\$801	\$950	\$988	\$913
	Home Energy Efficiency Kits & Education	\$47	\$116	\$118	\$94
	Subtotal	\$3,827	\$4,928	\$4,751	\$4,502
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$828	\$1,246	\$1,252	\$1,109
	Subtotal	\$828	\$1,246	\$1,252	\$1,109
INDIGENOUS PROGRAMS					
	Insulation and Direct Install	\$61	\$108	\$121	\$97
	Small Business	\$186	\$190	\$232	\$203
	Community Geothermal	\$245	\$425	\$433	\$367
	Metis Income Qualified	\$67	\$94	\$96	\$86
	Subtotal	\$560	\$817	\$881	\$753
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$1,995	\$2,046	\$2,098	\$2,046
	In-Suite Efficiency	\$59	\$90	\$122	\$91
	Renovation	\$15,311	\$14,543	\$13,744	\$14,533
	HVAC & Controls	\$810	\$897	\$955	\$887
	New Construction & High-Performance Buildings	\$1,082	\$1,464	\$1,341	\$1,296
	Custom	\$2,377	\$2,017	\$2,817	\$2,404
	Load Displacement	\$741	\$5,445	\$3,104	\$3,096
	Subtotal	\$22,375	\$26,502	\$24,181	\$24,353
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$0	\$150	\$1,177	\$443
	Subtotal	\$0	\$150	\$1,177	\$443
Program Totals		\$27,589	\$33,643	\$32,242	\$31,158
Enabling Strategies: Program Support and Education		\$0	\$0	\$0	\$0
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$0	\$0	\$0	\$0
Corporate Overhead		\$0	\$0	\$0	\$0
Total Electric Costs (000's \$)		\$27,589	\$33,643	\$32,242	\$31,158
<i>Note: May not add up due to rounding.</i>					

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		Annual Electric Program Design/Modelling/Admin/Support (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install	\$48	\$49	\$50	\$49
	Product Rebates	\$215	\$220	\$209	\$215
	Home Renovation	\$535	\$564	\$573	\$558
	New Homes & Major Renovation	\$38	\$66	\$61	\$55
	Home Energy Efficiency Kits & Education	\$75	\$76	\$77	\$76
	Subtotal	\$911	\$976	\$971	\$953
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$145	\$165	\$155	\$155
	Subtotal	\$145	\$165	\$155	\$155
INDIGENOUS PROGRAMS					
	Insulation and Direct Install	\$101	\$103	\$105	\$103
	Small Business	\$47	\$48	\$50	\$48
	Community Geothermal	\$58	\$60	\$61	\$59
	Metis Income Qualified	\$11	\$13	\$12	\$12
	Subtotal	\$217	\$224	\$228	\$223
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$336	\$343	\$349	\$343
	In-Suite Efficiency	\$75	\$76	\$78	\$76
	Renovation	\$1,586	\$1,610	\$1,643	\$1,613
	HVAC & Controls	\$121	\$116	\$118	\$119
	New Construction & High-Performance Buildings	\$253	\$232	\$211	\$232
	Custom	\$431	\$440	\$451	\$441
	Load Displacement	\$185	\$189	\$193	\$189
	Subtotal	\$2,988	\$3,006	\$3,042	\$3,012
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$97	\$128	\$221	\$149
	Subtotal	\$97	\$128	\$221	\$149
Program Totals		\$4,358	\$4,498	\$4,617	\$4,491
Enabling Strategies: Program Support and Education		\$0	\$0	\$0	\$0
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$0	\$0	\$0	\$0
Corporate Overhead		\$0	\$0	\$0	\$0
Total Electric Costs (000's \$)		\$4,358	\$4,498	\$4,617	\$4,491

Note: May not add up due to rounding.

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		Annual Electric Program Delivery (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install	\$69	\$96	\$124	\$96
	Product Rebates	\$1,296	\$1,201	\$1,124	\$1,207
	Home Renovation	\$378	\$394	\$401	\$391
	New Homes & Major Renovation	\$62	\$99	\$97	\$86
	Home Energy Efficiency Kits & Education	\$35	\$36	\$37	\$36
	Subtotal	\$1,841	\$1,826	\$1,782	\$1,816
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$125	\$147	\$135	\$136
	Subtotal	\$125	\$147	\$135	\$136
INDIGENOUS PROGRAMS					
	Insulation and Direct Install	\$34	\$44	\$46	\$41
	Small Business	\$77	\$130	\$188	\$132
	Community Geothermal	\$21	\$21	\$22	\$21
	Metis Income Qualified	\$11	\$27	\$25	\$21
	Subtotal	\$143	\$223	\$281	\$215
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$271	\$277	\$282	\$277
	In-Suite Efficiency	\$66	\$81	\$98	\$82
	Renovation	\$501	\$532	\$549	\$527
	HVAC & Controls	\$41	\$40	\$40	\$40
	New Construction & High-Performance Buildings	\$174	\$171	\$108	\$151
	Custom	\$211	\$210	\$479	\$300
	Load Displacement	\$57	\$58	\$60	\$58
	Subtotal	\$1,321	\$1,370	\$1,615	\$1,435
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$25	\$36	\$59	\$40
	Subtotal	\$25	\$36	\$59	\$40
Program Totals		\$3,455	\$3,602	\$3,872	\$3,643
Enabling Strategies: Program Support and Education		\$0	\$0	\$0	\$0
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$0	\$0	\$0	\$0
Corporate Overhead		\$0	\$0	\$0	\$0
Total Electric Costs (000's \$)		\$3,455	\$3,602	\$3,872	\$3,643

Note: May not add up due to rounding.

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		Annual Electric Advertising (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install	\$25	\$25	\$26	\$25
	Product Rebates	\$581	\$593	\$585	\$587
	Home Renovation	\$283	\$317	\$306	\$302
	New Homes & Major Renovation	\$12	\$34	\$21	\$23
	Home Energy Efficiency Kits & Education	\$2	\$2	\$2	\$2
	Subtotal	\$903	\$972	\$940	\$939
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$90	\$102	\$96	\$96
	Subtotal	\$90	\$102	\$96	\$96
INDIGENOUS PROGRAMS					
	Insulation and Direct Install	\$0	\$0	\$0	\$0
	Small Business	\$2	\$2	\$2	\$2
	Community Geothermal	\$0	\$0	\$0	\$0
	Metis Income Qualified	\$7	\$7	\$7	\$7
	Subtotal	\$9	\$9	\$9	\$9
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$33	\$33	\$34	\$33
	In-Suite Efficiency	\$5	\$5	\$5	\$5
	Renovation	\$28	\$25	\$25	\$26
	HVAC & Controls	\$34	\$29	\$29	\$31
	New Construction & High-Performance Buildings	\$7	\$7	\$7	\$7
	Custom	\$2	\$2	\$2	\$2
	Load Displacement	\$1	\$1	\$1	\$1
	Subtotal	\$109	\$102	\$103	\$105
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$2	\$2	\$6	\$3
	Subtotal	\$2	\$2	\$6	\$3
Program Totals		\$1,112	\$1,187	\$1,154	\$1,151
Enabling Strategies: Program Support and Education		\$0	\$0	\$0	\$0
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$0	\$0	\$0	\$0
Corporate Overhead		\$0	\$0	\$0	\$0
Total Electric Costs (000's \$)		\$1,112	\$1,187	\$1,154	\$1,151

Note: May not add up due to rounding.

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		Annual Electric Enabling Strategies & Corporate Overhead (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install				
	Product Rebates				
	Home Renovation				
	New Homes & Major Renovation				
	Home Energy Efficiency Kits & Education				
	Subtotal	\$0	\$0	\$0	\$0
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers				
	Subtotal	\$0	\$0	\$0	\$0
INDIGENOUS PROGRAMS					
	Insulation and Direct Install				
	Small Business				
	Community Geothermal				
	Metis Income Qualified				
	Subtotal	\$0	\$0	\$0	\$0
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances				
	In-Suite Efficiency				
	Renovation				
	HVAC & Controls				
	New Construction & High-Performance Buildings				
	Custom				
	Load Displacement				
	Subtotal	\$0	\$0	\$0	\$0
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology				
	Subtotal	\$0	\$0	\$0	\$0
Program Totals		\$0	\$0	\$0	\$0
Enabling Strategies: Program Support and Education		\$1,289	\$1,312	\$1,355	\$1,319
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$4,897	\$5,068	\$4,854	\$4,940
Corporate Overhead		\$1,844	\$1,841	\$2,889	\$2,191
Total Electric Costs (000's \$)		\$8,030	\$8,221	\$9,098	\$8,450

Note: May not add up due to rounding.

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TOTAL Annual Electric Costs (000's \$)								
					Annual Average			
					2020/21	2021/22	2022/23	
					2020/23 Efficiency Plan			
RESIDENTIAL PROGRAMS								
	Direct Install			\$406	\$578	\$753	\$579	
	Product Rebates			\$4,033	\$3,638	\$3,120	\$3,597	
	Home Renovation			\$1,971	\$3,107	\$3,169	\$2,749	
	New Homes & Major Renovation			\$913	\$1,149	\$1,168	\$1,077	
	Home Energy Efficiency Kits & Education			\$158	\$230	\$234	\$207	
		Subtotal		\$7,482	\$8,701	\$8,445	\$8,209	
INCOME QUALIFIED PROGRAMS								
	Income Qualified Offers			\$1,188	\$1,660	\$1,637	\$1,495	
		Subtotal		\$1,188	\$1,660	\$1,637	\$1,495	
INDIGENOUS PROGRAMS								
	Insulation and Direct Install			\$196	\$256	\$272	\$241	
	Small Business			\$313	\$370	\$472	\$385	
	Community Geothermal			\$323	\$505	\$515	\$448	
	Metis Income Qualified			\$97	\$141	\$140	\$126	
		Subtotal		\$929	\$1,272	\$1,398	\$1,200	
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS								
	Small Business & Appliances			\$2,636	\$2,698	\$2,763	\$2,699	
	In-Suite Efficiency			\$204	\$253	\$303	\$253	
	Renovation			\$17,425	\$16,710	\$15,961	\$16,699	
	HVAC & Controls			\$1,006	\$1,083	\$1,142	\$1,077	
	New Construction & High-Performance Buildings			\$1,516	\$1,875	\$1,667	\$1,686	
	Custom			\$3,021	\$2,668	\$3,749	\$3,146	
	Load Displacement			\$984	\$5,693	\$3,357	\$3,344	
		Subtotal		\$26,793	\$30,980	\$28,942	\$28,905	
EMERGING TECHNOLOGY PROGRAMS								
	Emerging Technology			\$124	\$317	\$1,463	\$635	
		Subtotal		\$124	\$317	\$1,463	\$635	
Program Totals				\$36,515	\$42,930	\$41,885	\$40,443	
Enabling Strategies: Program Support and Education				\$1,289	\$1,312	\$1,355	\$1,319	
Enabling Strategies: Innovation, Codes & Standards and Evaluation				\$4,897	\$5,068	\$4,854	\$4,940	
Corporate Overhead				\$1,844	\$1,841	\$2,889	\$2,191	
Total Electric Costs (000's \$)				\$44,545	\$51,151	\$50,983	\$48,893	

Note: May not add up due to rounding.

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		Annual Natural Gas Incentive Costs (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install	\$57	\$93	\$127	\$92
	Product Rebates	\$472	\$405	\$52	\$310
	Home Renovation	\$602	\$2,729	\$3,497	\$2,276
	New Homes & Major Renovation	\$211	\$463	\$512	\$395
	Home Energy Efficiency Kits & Education	\$23	\$36	\$36	\$32
	Subtotal	\$1,365	\$3,727	\$4,224	\$3,105
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$4,486	\$4,542	\$5,107	\$4,712
	Subtotal	\$4,486	\$4,542	\$5,107	\$4,712
INDIGENOUS PROGRAMS					
	Metis Income Qualified	\$210	\$212	\$239	\$221
	Subtotal	\$210	\$212	\$239	\$221
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$216	\$220	\$226	\$220
	In-Suite Efficiency	\$38	\$58	\$79	\$58
	Renovation	\$1,888	\$1,911	\$2,143	\$1,981
	HVAC & Controls	\$533	\$571	\$612	\$572
	New Construction & High-Performance Buildings	\$1,558	\$2,071	\$1,835	\$1,822
	Custom	\$1,664	\$962	\$1,395	\$1,340
	Subtotal	\$5,896	\$5,793	\$6,290	\$5,993
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$0	\$74	\$102	\$59
	Subtotal	\$0	\$74	\$102	\$59
Program Totals		\$11,958	\$14,348	\$15,961	\$14,089
Enabling Strategies: Program Support and Education		\$0	\$0	\$0	\$0
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$0	\$0	\$0	\$0
Corporate Overhead		\$0	\$0	\$0	\$0
Total Natural Gas Costs (000's \$)		\$11,958	\$14,348	\$15,961	\$14,089

Note: May not add up due to rounding.

**2020-2023 Efficiency Plan
COALITION/EM I-39a-d**

		Annual Natural Gas Program Design/Modelling/Admin/Support (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install	\$48	\$49	\$50	\$49
	Product Rebates	\$69	\$70	\$37	\$59
	Home Renovation	\$147	\$148	\$153	\$149
	New Homes & Major Renovation	\$54	\$92	\$87	\$78
	Home Energy Efficiency Kits & Education	\$74	\$76	\$77	\$76
	Subtotal	\$392	\$435	\$403	\$410
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$580	\$575	\$599	\$585
	Subtotal	\$580	\$575	\$599	\$585
INDIGENOUS PROGRAMS					
	Metis Income Qualified	\$32	\$31	\$33	\$32
	Subtotal	\$32	\$31	\$33	\$32
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$22	\$23	\$23	\$23
	In-Suite Efficiency Renovation	\$0	\$0	\$0	\$0
	HVAC & Controls	\$161	\$171	\$173	\$168
	New Construction & High-Performance Buildings	\$170	\$174	\$178	\$174
	Custom	\$291	\$271	\$268	\$277
	Subtotal	\$219	\$223	\$227	\$223
	Subtotal	\$863	\$862	\$868	\$864
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$48	\$49	\$50	\$49
	Subtotal	\$48	\$49	\$50	\$49
Program Totals		\$1,916	\$1,952	\$1,953	\$1,940
Enabling Strategies: Program Support and Education		\$0	\$0	\$0	\$0
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$0	\$0	\$0	\$0
Corporate Overhead		\$0	\$0	\$0	\$0
Total Natural Gas Costs (000's \$)		\$1,916	\$1,952	\$1,953	\$1,940

Note: May not add up due to rounding.

**2020-2023 Efficiency Plan
COALITION/EM I-39a-d**

		Annual Natural Gas Program Delivery (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install	\$69	\$96	\$124	\$96
	Product Rebates	\$206	\$192	\$104	\$167
	Home Renovation	\$105	\$105	\$108	\$106
	New Homes & Major Renovation	\$89	\$139	\$140	\$123
	Home Energy Efficiency Kits & Education	\$36	\$36	\$37	\$36
	Subtotal	\$504	\$568	\$513	\$528
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$507	\$518	\$528	\$518
	Subtotal	\$507	\$518	\$528	\$518
INDIGENOUS PROGRAMS					
	Metis Income Qualified	\$32	\$69	\$71	\$57
	Subtotal	\$32	\$69	\$71	\$57
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$9	\$9	\$9	\$9
	In-Suite Efficiency Renovation	\$0	\$0	\$0	\$0
	HVAC & Controls	\$46	\$63	\$66	\$58
	New Construction & High-Performance Buildings	\$56	\$57	\$59	\$57
	Custom	\$222	\$220	\$189	\$211
	Subtotal	\$68	\$69	\$71	\$69
	Subtotal	\$401	\$418	\$394	\$404
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$13	\$13	\$14	\$13
	Subtotal	\$13	\$13	\$14	\$13
Program Totals		\$1,456	\$1,586	\$1,520	\$1,521
Enabling Strategies: Program Support and Education		\$0	\$0	\$0	\$0
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$0	\$0	\$0	\$0
Corporate Overhead		\$0	\$0	\$0	\$0
Total Natural Gas Costs (000's \$)		\$1,456	\$1,586	\$1,520	\$1,521

Note: May not add up due to rounding.

**2020-2023 Efficiency Plan
COALITION/EM I-39a-d**

		Annual Natural Gas Advertising (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install	\$25	\$25	\$26	\$25
	Product Rebates	\$144	\$145	\$80	\$123
	Home Renovation	\$78	\$84	\$82	\$81
	New Homes & Major Renovation	\$18	\$48	\$31	\$32
	Home Energy Efficiency Kits & Education	\$2	\$2	\$2	\$2
	Subtotal	\$266	\$304	\$220	\$263
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$360	\$357	\$372	\$363
	Subtotal	\$360	\$357	\$372	\$363
INDIGENOUS PROGRAMS					
	Metis Income Qualified	\$18	\$18	\$19	\$19
	Subtotal	\$18	\$18	\$19	\$19
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$2	\$2	\$2	\$2
	In-Suite Efficiency Renovation	\$0	\$0	\$0	\$0
	HVAC & Controls	\$7	\$6	\$6	\$6
	New Construction & High-Performance Buildings	\$39	\$40	\$37	\$38
	Custom	\$8	\$8	\$8	\$8
	Subtotal	\$64	\$64	\$62	\$63
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$2	\$2	\$2	\$2
	Subtotal	\$2	\$2	\$2	\$2
Program Totals		\$711	\$745	\$675	\$710
Enabling Strategies: Program Support and Education		\$0	\$0	\$0	\$0
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$0	\$0	\$0	\$0
Corporate Overhead		\$0	\$0	\$0	\$0
Total Natural Gas Costs (000's \$)		\$711	\$745	\$675	\$710

Note: May not add up due to rounding.

**2020-2023 Efficiency Plan
COALITION/EM I-39a-d**

		Annual Electric Enabling Strategies & Corporate Overhead (000's \$)			
		2020/21	2021/22	2022/23	Annual Average
RESIDENTIAL PROGRAMS					
	Direct Install				
	Product Rebates				
	Home Renovation				
	New Homes & Major Renovation				
	Home Energy Efficiency Kits & Education				
	Subtotal	\$0	\$0	\$0	\$0
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers				
	Subtotal	\$0	\$0	\$0	\$0
INDIGENOUS PROGRAMS					
	Metis Income Qualified				
	Subtotal	\$0	\$0	\$0	\$0
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances				
	In-Suite Efficiency				
	Renovation				
	HVAC & Controls				
	New Construction & High-Performance Buildings				
	Custom				
	Subtotal	\$0	\$0	\$0	\$0
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology				
	Subtotal	\$0	\$0	\$0	\$0
Program Totals		\$0	\$0	\$0	\$0
Enabling Strategies: Program Support and Education		\$353	\$341	\$355	\$350
Enabling Strategies: Innovation, Codes & Standards and Evaluation		\$1,632	\$1,689	\$1,618	\$1,647
Corporate Overhead		\$615	\$614	\$963	\$730
Total Natural Gas Costs (000's \$)		\$2,600	\$2,644	\$2,936	\$2,727

Note: May not add up due to rounding.

**2020-2023 Efficiency Plan
COALITION/EM I-39a-d**

Annual Natural Gas Costs (000's \$)					
				Annual Average	
				2020/21	
				2021/22	
				2022/23	
				2020/23 Efficiency Plan	
RESIDENTIAL PROGRAMS					
	Direct Install	\$199	\$264	\$327	\$263
	Product Rebates	\$890	\$813	\$272	\$658
	Home Renovation	\$933	\$3,066	\$3,839	\$2,612
	New Homes & Major Renovation	\$371	\$742	\$769	\$627
	Home Energy Efficiency Kits & Educat	\$135	\$149	\$152	\$145
		\$2,528	\$5,033	\$5,360	\$4,307
INCOME QUALIFIED PROGRAMS					
	Income Qualified Offers	\$5,934	\$5,992	\$6,606	\$6,177
		\$5,934	\$5,992	\$6,606	\$6,177
INDIGENOUS PROGRAMS					
	Metis Income Qualified	\$292	\$330	\$362	\$328
		\$292	\$330	\$362	\$328
COMMERCIAL, INDUSTRIAL & AGRICULTURAL PROGRAMS					
	Small Business & Appliances	\$249	\$254	\$260	\$254
	In-Suite Efficiency	\$38	\$58	\$79	\$58
	Renovation	\$2,102	\$2,151	\$2,387	\$2,213
	HVAC & Controls	\$797	\$841	\$886	\$842
	New Construction & High-Performanc	\$2,079	\$2,570	\$2,301	\$2,317
	Custom	\$1,959	\$1,262	\$1,702	\$1,641
		\$7,224	\$7,136	\$7,615	\$7,325
EMERGING TECHNOLOGY PROGRAMS					
	Emerging Technology	\$63	\$139	\$168	\$123
		\$63	\$139	\$168	\$123
Program Totals		\$16,041	\$18,631	\$20,110	\$18,261
Enabling Strategies: Program Support and Education		\$353	\$341	\$355	\$350
Enabling Strategies: Innovation, Codes & Standards		\$1,632	\$1,689	\$1,618	\$1,647
Corporate Overhead		\$615	\$614	\$963	\$730
Total Natural Gas Costs (000's \$)		\$18,641	\$21,275	\$23,047	\$20,987
<i>Note: May not add up due to rounding.</i>					

- b) Part A reconciles to Attachment 3.
- c) There is no difference between i) and ii).
- d) Advertising is provided in part a) of this question.

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EFFICIENCY MANITOBA 2020-2023 EFFICIENCY PLAN

PUB INFORMATION REQUESTS OF CONSUMERS COALITION

DECEMBER 13, 2019

- b) Yes electricity sales made in Diesel communities should be included in the “baseline”. These sales are metered and sold to customers in Manitoba and therefore meet the definition of electrical consumption per the Act.

PUB/COALITION - 20 Reference: Harper Evidence p.34, 35 (Updated Evidence pages 47-48)

Request:

Provide a table showing the allocation percentages and allocated dollars of Enabling Strategies and Corporate Overhead to the electric and gas portfolios based on the methods identified in Mr. Harper’s evidence including: a) EM’s proposed method, b) allocation by benefits, c) allocation by program costs, and d) allocation by program staff costs.

Response:

As noted in Mr. Harper’s Evidence (pages 46-47) not all of the Enabling Strategies costs are allocated between the two portfolios. A small portion is directly assigned. In order to respond to the question it is first necessary to identify that portion of the Enabling Strategies costs that are directly assigned. The following table from Coalition/EM I-44 shows Efficiency Manitoba’s allocation of Enabling Strategies costs and those areas where the allocation differs from standard 75/25 split.

EFFICIENCY MANITOBA 2020-2023 EFFICIENCY PLAN
PUB INFORMATION REQUESTS OF CONSUMERS COALITION
DECEMBER 13, 2019

Attachment 3 Cost Categories	Appendix A - Section A9 Categories	A9 Sub Categories	Annual Average			Allocation	
			ELECTRIC BUDGET	NATURAL GAS BUDGET	OVERALL BUDGET	Electric	Natural Gas
Enabling Strategies: Program Support and Education	Engagement Initiatives	Program Support & Education (Efficiency Manitoba Staff)	\$483,000	\$147,000	\$630,000	77%	23%
		Emerging Technologies Support (Efficiency Manitoba Staff)	\$115,000	\$0	\$115,000	100%	0%
		Contracted program support services	\$290,000	\$60,000	\$350,000	83%	17%
		Program support expenses (energy advocates, travel, curriculums)	\$259,000	\$86,000	\$345,000	75%	25%
		Creative design support, materials and supplies.	\$172,000	\$57,000	\$229,000	75%	25%
		SUBTOTAL (Attachment 3 - Enabling Strategies: Program Support & Education)		\$1,319,000	\$350,000	\$1,669,000	79%
Enabling Strategies: Innovation, Codes & Standards, Evaluation	Engagement Initiatives	Business Communications (Efficiency Manitoba Staff)	\$145,000	\$48,000	\$193,000	75%	25%
		Business Communications	\$337,000	\$112,000	\$449,000	75%	25%
		CRM/DSM and enterprise systems	\$414,000	\$138,000	\$552,000	75%	25%
	Emerging Technologies and Codes & Standards	Codes & Standards (Efficiency Manitoba Staff)	\$16,000	\$5,000	\$21,000	75%	25%
		Evaluation & Planning (Efficiency Manitoba Staff)	\$418,000	\$139,000	\$557,000	75%	25%
		Innovation / Research & Development (Market Potential Study)	\$535,000	\$178,000	\$713,000	75%	25%
		Codes & Standards	\$366,000	\$122,000	\$488,000	75%	25%
	Other (Not specifically referenced in A9)	Contracted program support services	\$1,213,000	\$406,000	\$1,619,000	75%	25%
		Contracted business support services	\$460,000	\$153,000	\$613,000	75%	25%
		Legal / business consultants	\$857,000	\$286,000	\$1,142,000	75%	25%
		Professional development, memberships and training	\$179,000	\$60,000	\$239,000	75%	25%
		SUBTOTAL (Enabling Strategies: Innovation, Codes & Standards, Evaluation)	\$4,940,000	\$1,647,000	\$6,586,000	75%	25%
		SUBTOTAL Efficiency Manitoba Staff (See Table 4.7, Plan, p.115 of 591)	\$1,177,000	\$339,000	\$1,516,000	78%	22%
		SUBTOTAL Private Sector (See Table 4.7, Plan, p.115 of 591)	\$5,082,000	\$1,658,000	\$6,739,000	75%	25%
		TOTAL	\$6,259,000	\$1,997,000	\$8,255,000	76%	24%

Note. Currency is expressed in nominal dollars. Totals may not add up exactly due to rounding.

Using the 79/21 split for \$1,669,000 in cost for Enabling Strategies: Program Support and Education it is estimated that \$269,000 is directly assigned to the electric portfolio leaving \$7,986,000 in Enabling Strategies costs plus \$2,921,000 in Corporate Overheads - for a total of \$10,907,000 to be allocated. The following Tables set out the overall allocation of Enabling Strategies and Corporate Overheads (percentage and dollars) based on: a) EM's proposed method, b) allocation by program costs, and c) allocation by program staff costs.

EFFICIENCY MANITOBA 2020-2023 EFFICIENCY PLAN
PUB INFORMATION REQUESTS OF CONSUMERS COALITION
DECEMBER 13, 2019

Table: PUB/COALITION20-1 A							
ALLOCATION OF ENABLING STRATEGIES AND CORPORATE OVERHEADS							
EFFICIENCY MANITOBA'S PROPOSED METHOD							
(Average Annual Costs)							
	<u>Electricity</u>		<u>Natural Gas</u>		<u>Total</u>		
	<u>%</u>	<u>\$ '000s</u>	<u>%</u>	<u>\$ '000s</u>	<u>%</u>	<u>\$ '000s</u>	
Directly Assigned	100%	269	0%	-	100%	269	
Allocated	75%	8,180	25%	2,727	100%	10,907	
Total	75.6%	8,449	24.4%	2,727	100%	11,176	

Table: PUB/COALITION20-1 B							
ALLOCATION OF ENABLING STRATEGIES AND CORPORATE OVERHEADS							
BASED ON PROGRAM COSTS							
(Average Annual Costs)							
	<u>Electricity</u>		<u>Natural Gas</u>		<u>Total</u>		
	<u>%</u>	<u>\$ '000s</u>	<u>%</u>	<u>\$ '000s</u>	<u>%</u>	<u>\$ '000s</u>	
Directly Assigned	100%	269	0%	-	100%	269	
Allocated	68.9%	7,515	31.1%	3,392	100%	10,907	
Total	69.6%	7,784	30.4%	3,392	100%	11,176	

Table: PUB/COALITION20-1 C							
ALLOCATION OF ENABLING STRATEGIES AND CORPORATE OVERHEADS							
BASED ON PROGRAM COSTS							
(Average Annual Costs)							
	<u>Electricity</u>		<u>Natural Gas</u>		<u>Total</u>		
	<u>%</u>	<u>\$ '000s</u>	<u>%</u>	<u>\$ '000s</u>	<u>%</u>	<u>\$ '000s</u>	
Directly Assigned	100%	269	0%	-	100%	269	
Allocated	69.8%	7,613	30.2%	3,294	100%	10,907	
Total	70.5%	7,882	29.5%	3,294	100%	11,176	

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to the implied pace of installations, which in some cases appear to be much higher than achieved in the legacy Manitoba Hydro DSM program.

Our initial review finds deliverability concerns because Efficiency Manitoba acknowledges in the report and in responses to discovery that:

- 1) Efficiency Manitoba has committed to increase energy savings under a substantially lower budget compared to the existing Manitoba Hydro program.
- 2) Efficiency Manitoba plans to achieve this savings goal with 30% less staff than Manitoba Hydro relied on.,
- 3) Efficiency Manitoba will not be able to meet its natural gas savings target for the first year,
- 4) Efficiency Manitoba relies on new or updated sources for estimating participation, including consultations with delivery partners, survey data and recent permit applications, which may produce a step change increase in the level of saving expected for existing programs.,
- 5) Efficiency Manitoba's CRM system remains under development at this time and is untested, and
- 6) Efficiency Manitoba has yet to secure agreements with all the trade partners required for proposed new measures to serve hard to reach customer segments.

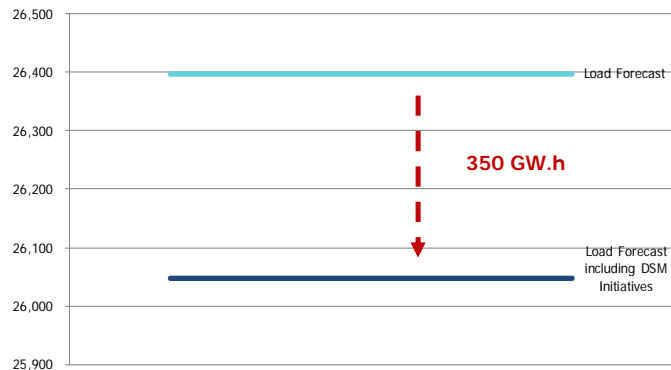
In summary, Efficiency Manitoba's 3-Year Plan includes a comprehensive list of program offerings for all customer sectors that are combined into program bundles for ease of marketing to customers. Accelerated pace of installs should be expected due to the ease with which customers can sign up for multiple measures through the program bundle interface (once the CRM system is fully deployed) and the addition of new qualifying applications (e.g., foundation insulation), plus new programs designed to attract hard to reach customer classes. Efficiency Manitoba should be able to recognize today that insufficient delivery capacity can derail success, because success is inextricably tied to the pace of installations implicit in its own plan. Without a prompt expansion in the ranks of delivery partners, and early and adequate marketing of the bundling approach and its simplicity for customers, it may be difficult for Efficiency Manitoba to meet its admirably ambitious goals. This concern is key to the first year's targets since ramp up of tools, messaging and partners will encumber the first year probably well into the year.

Meeting Future Energy Needs of Manitobans

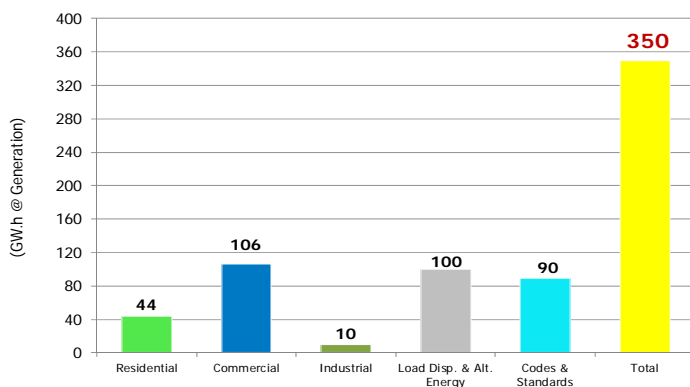
Electric Energy Savings

In 2019/20, Manitoba Hydro plans to capture electricity savings of 284 MW and 350 GW.h. Along with constructing new renewable hydro generation, Demand Side Management is a key component of Manitoba Hydro's strategy for meeting the province's future energy needs. The energy savings achieved through DSM will represent 1.3% of the actual Manitoba electric load for 2018/19. In 2019/20, Manitoba Hydro plans to capture electricity energy savings of 10 MW and 44 GW.h in the residential sector, 22 MW and 106 GW.h in the commercial sector, 215 MW and 10 GW.h in the industrial sector, 14 MW and 100 GW.h through load displacement and alternative energy opportunities and 23 MW and 90 GW.h resulting from efforts relating to codes and standards.

DSM Impacts on Electric Load Forecast
(2019/20)



Electric Energy Savings
(2019/20)



evaluation, measurement, and verification. Taking deliverability and benefit costs questions together, we identified any major issues leading to questions about the Plan's ability to meet its three year and fifteen-year targets, considering the role of codes and standards, conservation rates, and solar programs and net metering. In addition, we assessed the likely accuracy of Efficiency Manitoba's projections of the rate impact of the program.

Our report makes the following major observations about the Plan:

- As a document, the Plan is complete and addresses the requirements of the Act and Regulation in terms of its content. The Plan reports projected savings that are, overall, compliant with the targets established in the Act
- We have some concerns about the ability of Efficiency Manitoba to deliver the volume of services and to recruit the levels of customer participation that it projects in the Plan. On the one hand, the fact that Efficiency Manitoba plans to continue a number of programs already being operated by Manitoba Hydro may help it get off to a good start. However, in some cases, Efficiency Manitoba is projecting customer participation rates significantly higher than those achieved by Manitoba Hydro. In other cases, program delivery may be hindered by the fact that all the third-party partners Efficiency Manitoba plans to work with are not yet on board. Finally, Efficiency Manitoba's Plan highlights the important role to be played by a new Customer Relationship Management system that will ease the process of program sign up for customers. However, a contractor for the system is not scheduled to be selected until 2020. Because computer system development is notorious for delays, there may be a risk that a delayed CRM roll-out will cause Efficiency Manitoba to miss its participation targets
- Reviewing the costs and benefits of Efficiency Manitoba's program proposals in terms of common benefit-cost assessment tests, we concur with Efficiency Manitoba's assessment of the relative efficiency of electric and natural gas programs, which finds a high NPV for electricity programs, and a NPV of roughly one (the break-even level) for natural gas programs. Extending cost-benefit analysis to include customer costs and the benefits of greenhouse gas emissions and water usage reductions changes the numbers for some programs, but does not significantly change the overall picture
- At the measure level, not every measure is cost-effective, even assuming program costs of zero, especially in the natural gas portfolio. Although there may be reasons to preserve these measures, based on considerations like

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SECTION 7 – EFFICIENCY MANITOBA IS DEVELOPING A COMPREHENSIVE APPROACH TO MONITOR & EVALUATE PERFORMANCE & CONTINUOUSLY IMPROVE

7.1 EFFICIENCY MANITOBA IS PURSUING THE DEVELOPMENT OF A CRM/DSM SYSTEM TO CONTINUOUSLY MONITOR & REPORT ON SAVINGS & INVESTMENTS AT THE MEASURE & PROGRAM BUNDLE LEVEL

252 The Plan proposes to evaluate performance, implement improvements identified and
253 continuously act on lessons learned. Key to the success of Efficiency Manitoba is the
254 procurement and implementation of a comprehensive and integrated customer
255 relationship management (“CRM”) and DSM system (the “CRM/DSM system”). This is
256 overarching strategy will streamline and enhance operations at Efficiency Manitoba
257 from both customer-facing and internal operational perspectives.

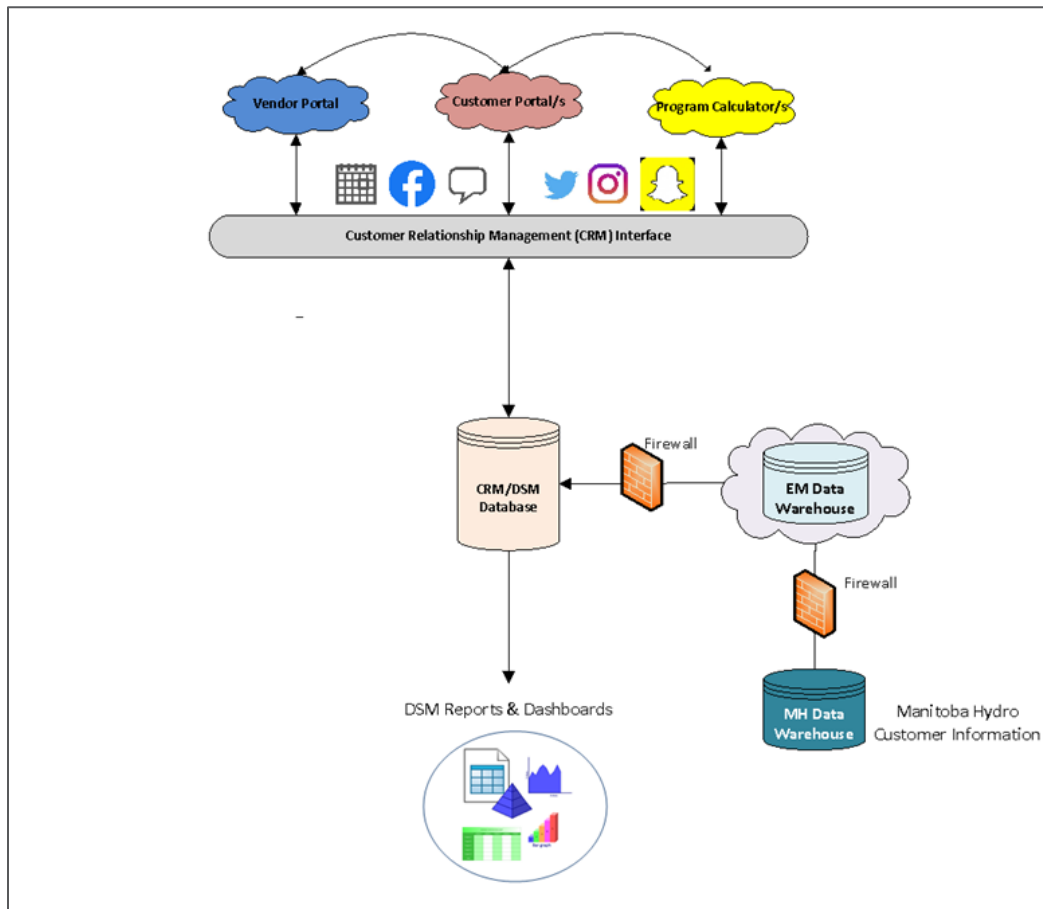
258 The CRM/DSM system will be an invaluable tool for providing Efficiency Manitoba
259 with centralized capability to continuously monitor and report on savings and
260 investments at the measure and program bundle level. The following figure illustrates
261 the role of the CRM/DSM system within the context of complimentary strategies and
262 continuous improvement.

7.1 EFFICIENCY MANITOBA IS PROCURING A CRM/DSM SYSTEM TO CONTINUOUSLY MONITOR & REPORT ON THE SAVINGS & BUDGETS AT THE MEASURE & PROGRAM BUNDLE LEVEL

18 Foundational to the success of Efficiency Manitoba is the procurement and
19 implementation of a comprehensive and integrated customer relationship
20 management/demand side management (CRM/DSM) system. This is a critical and
21 overarching strategy that will streamline and enhance operations at Efficiency
22 Manitoba from both customer-facing and internal operations perspectives. In addition
23 to the customer service and operational benefits discussed in *Appendix A - Section*
24 *A2.1.2*, the CRM/DSM system will be an invaluable tool providing Efficiency Manitoba
25 with the ability to continuously monitor and report on savings and budget at the
26 measure and program bundle level. As performance gaps are identified, adjustments
27 can be made to marketing and delivery activities to ensure intended performance is
28 being achieved on a near real-time basis. A schematic illustrating the preliminary
29 architecture of the CRM/DSM system is provided in Figure 7.2.

30 The ongoing monitoring and evaluations of DSM program energy savings and results
31 will be tracked through reporting and dashboard functions. Additionally, access to
32 portfolio performance data will be provided to independent evaluators.

FIGURE 7.2 PROPOSED HIGH-LEVEL ARCHITECTURE OF CRM/DSM SYSTEM



7.2 EFFICIENCY MANITOBA HAS DEVELOPED A SCORECARD TO BENCHMARK DSM PORTFOLIO & CORPORATE PERFORMANCE AGAINST OTHER ENERGY EFFICIENCY PROGRAM ADMINISTRATORS

33 Efficiency Manitoba has developed a DSM Scorecard to benchmark both portfolio
 34 performance and corporate performance against other energy efficiency program
 35 administrators. Integrating regular benchmarking will establish baseline data and
 36 measures in critical performance areas and help identify potential practices for
 37 adoption by Efficiency Manitoba. The scorecard will be used to report on actual

REFERENCE:

3 (PDF 180)
3-4 (PDF 418-419)

PREAMBLE TO IR (IF ANY):**QUESTION:**

- a) What is the current development status of the CRM/DSM System and when is it expected to be fully functional/in-service? Please list all milestones that have been achieved to date and the date on which each was completed.
- b) What is the total budget for the development/implementation of the CRM/DSM system?
- c) How much will have been spent as of March 31, 2020 and what are the annual expenditures for each of the three years in the Plan?
- d) Is the System being developed by a 3rd party contractor?
 - I. If yes, has the contractor been selected?
 - II. If yes, was the contractor selected using an open RFP process?

RATIONALE FOR QUESTION:

To better understand the status and cost of the CRM/DSM System.

RESPONSE:

- a) The procurement and subsequent implementation of a CRM/DSM system is currently underway. Completed milestones include:
 - development and issuance of a Request for Qualified Suppliers (RFQS) to procure the services of an external Information Technology Project Manager – June 2019;
 - Information Technology Project Manager role awarded, and individual onboarded – August 2019;
 - review and assessment of all current Manitoba Hydro Demand Side Management Program databases and associated systems – September 2019;
 - legal requirements review to support the ‘to be developed’ system purchase and

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implementation Request for Proposal – September 2019;

- development and approval of Project Charter – September 2019;
- development of requirements documentation to support system purchase and implementation Request for Proposal – October 2019;

Future targeted milestones include:

- finalize development and subsequent issuance of a system purchase and implementation Request for Proposal – by December 2019;
 - development and issuance of a Request for Qualified Suppliers (RFQS) to procure the services of an external Information Technology Business Analyst – by January 2020;
 - vendor evaluation and selection for system purchase and implementation – by February 2020;
 - implementation work to commence – by March 2020, with;
 - various features of the CRM/DSM system being implemented in a phased approach between August 2020 and November 2020.
- b) The total 2020/23 budget for the purchase and development/implementation of the CRM/DSM system is \$1,656,000. This budget also includes additional Efficiency Manitoba enterprise systems such as accounting and human resources.
- c) As of March 31, 2020, total expenditures associated with the CRM/DSM system are estimated to be \$440,000 and are funded via the transitional provisions in the Efficiency Manitoba Act. Annual expenditures associated with the CRM/DSM system, and other Efficiency Manitoba enterprise systems, for each of the three years in the Plan are: 2020/21 = \$542,000; 2021/22 = \$552,000; and 2022/23 = \$563,000.
- d) Confirmed. The system will be purchased from, and implemented by, a third party vendor.
- I. The successful vendor has yet to be selected. A formal shortlist of vendors will be identified following a review of all bids to the system purchase and implementation Request for Proposal during the vendor evaluation process, culminating with final selection taking place in February 2020.

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- II. Yes, the vendor will be selected using an open RFP process advertised and distributed through MERX - electronic tendering service. MERX provides vendors with a low-cost, easily accessible and transparent way of reviewing and obtaining government tenders.

REFERENCE:

Section 7.1, page 180, lines 18-22

PREAMBLE TO IR (IF ANY):

Efficiency Manitoba states that the procurement and implementation of a comprehensive and integrated customer relationship management/demand side management (CRM/DSM) system is foundational to its success

QUESTION:

Does the reference to the CRM/DSM system in the future tense mean that it has yet to be deployed, and if so, what is the timeline before it can be demonstrated as being in use and able to provide validated data? Does the cost for this CRM program include a contingency fee and/or a factor to accommodate delay in deployment?

RATIONALE FOR QUESTION:

Determine the pace at which Efficiency Manitoba will be able to show that savings have been achieved, so that progress towards annual goals can be measured. Please also provide examples of dashboard reporting.

RESPONSE:

The procurement and subsequent implementation of an integrated Customer Relationship Management System and Demand Side Management Tracking System (“CRM/DSM system”) is currently ongoing. Future targeted milestones include issuance of a Request for Proposal by December 2019; vendor evaluation and selection by February 2020; and implementation work commencing by March 2020.

Various features of the CRM/DSM system will go live in a phased approach between August 2020 and November 2020. Legacy tracking systems will continue to be utilized to provide all required interim reporting until the CRM/DSM system is live, tested and completely operational.

Dashboard reporting will be fully defined during the implementation phase, however, will include but is not limited to monthly and year-to-date cumulative results versus targeted results, as it relates to:

- electricity energy savings (kWh)
- electricity demand savings (kW)
- natural gas savings (m3)
- GHG reductions (CO₂e)
- customer bill savings (\$)
- budget expenditures (\$)
- number of participants

The above dashboard reporting will be available for each program bundle as well as at the customer segment level for Residential; Income Qualified; Indigenous; and Commercial, Industrial, and Agricultural.

Budget development for the CRM/DSM system considered potential risks and associated costs during implementation, including but not limited to, delays as well as configuration and customization requirements.

REFERENCE:

Refer to 2020/23 Efficiency Plan, Section 7, PDF page 180

PREAMBLE TO IR (IF ANY):

EM is proposing to implement a comprehensive and integrated customer relationship management/demand side management system for streamlining and enhancing operations.

QUESTION:

- a) Please provide the detailed information of CRM/DSM system.
- b) What is the status of CRM/DSM system procurement? Does EM have shortlist of CRM/DSM system providers?

RATIONALE FOR QUESTION:

CRM/DSM system.

RESPONSE:

- a) The Customer Relationship Management System and Demand Side Management Tracking System (“CRM/DSM system”), will offer the following features:
 - Manages all aspects of customer and contractor relationships, including but not limited to, tracking customer data, project status, and issues.
 - Simplifies transfer of customer utility information from Manitoba Hydro to Efficiency Manitoba.
 - Stores, tracks, and manages Demand Side Management program data and workflows, and has the ability to:
 - Track customer participation, savings (including incorporating calculation methodologies), and costs;
 - Offer online customer and vendor application forms;
 - Provide vendor specific portals for direct entry of program data by outside parties; and

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- Show dashboards and generate reporting.
 - Maintains all customer and program data securely while accessible via cloud for all staff in and away from the office.
 - Leverages “out-of-the box” functionality to minimize configuration and customization effort and cost – Efficiency Manitoba will consider redesign of present-day process flow, data, and reporting to accommodate.
 - Has minimal ongoing in-house I.T. resources required to support (i.e. Software as a Service).
- b) The procurement and subsequent implementation of an integrated CRM/DSM system is currently underway. Future targeted milestones include issuance of a Request for Proposal by December 2019; vendor evaluation and selection by February 2020; and implementation work commencing by March 2020.

A formal shortlist of vendors will be identified following a review of all bids to the Request for Proposal during the vendor evaluation process, culminating with final selection taking place in February 2020.

18

1.4.3 Risk Management

As Manitoba Hydro's DSM plan involves a diverse offering of many programs and initiatives, the risk associated with achieving the targeted energy savings is inherently minimized through diversification. In addition, the overall risk is further reduced by undertaking ongoing and regular reviews of individual program performance and making regular adjustments to the Corporation's overall DSM plan on an annual basis.

Energy Efficiency Programs – Risk Level: Low

Energy Efficiency programs present a relatively low level of risk to the Corporation. Energy efficiency program participation and resulting savings build gradually over time which allows for adjustment to the program designs, ensuring alignment with long term targets. Program participation and resulting energy and capacity savings achieved are tracked quarterly for each initiative to provide timely feedback and opportunity for design changes. Similarly, program costs are managed by comparing expenditures to the program budget on a monthly basis to identify variances from planned expenditures. Free ridership rates and other factors that impact program energy and capacity savings are also measured on an annual basis through the impact evaluation process which also provide timely feedback. Although Manitoba Hydro's overall plan is formally adjusted on an annual basis, adjustments are made to specific programs throughout the year and implemented when deemed appropriate.

Load Displacement and Alternative Energy Programs – Risk Level: High

The risk associated with achieving the energy savings with the Load Displacement and Alternative Energy programs present a relatively high level of risk to the Corporation. This risk is generally related more towards the timing of the achievement of the energy savings. These initiatives involve a much smaller number of customers, large capital investment required by customers, complex installations and the need to integrate the projects into production processes while minimizing downtime. Since each of the smaller number of participants have large potential energy and capacity savings, there is less diversification in the load displacement portfolio, meaning variances in the timing of these projects will have a dramatic impact on annual targets for both program expenditures and energy and capacity savings. The risks will be managed by working closely with customers and by assisting them with assessing their respective business cases supporting each opportunity. Although there is a short-term timing risk related to the implementation of the projects, the long-term impact to Manitoba Hydro is relatively insignificant provided the projects are undertaken within a reasonable period of time and prior to decisions involving adding new generation supply in Manitoba. There is a reasonable probability that the majority of the identified projects will be implemented within the time frame of this plan.

19

APPENDIX A – SECTION A3

PORTFOLIO OVERVIEW: SAVINGS, BUDGET & COST-EFFECTIVENESS

- 1 This section provides an overview of the electric and natural gas portfolio from the
- 2 program bundle perspective and details the energy savings, budgets required, and
- 3 cost-effectiveness metrics.

A3.1 ACHIEVING MANDATED ENERGY SAVINGS TARGETS

A3.1.1 ANNUAL PORTFOLIO ENERGY SAVINGS

- 4 Table A3.1 provides the annual and overall average electric energy savings in
- 5 gigawatt-hours (GWh) and as a percentage of electric load for both program impacts
- 6 and the contribution of electric codes and standards. Also shown in Table A3.1 are the
- 7 annual electric capacity savings resulting from the electric portfolio.

TABLE A3.1 2020/23 EFFICIENCY PLAN SUMMARY – ELECTRIC PORTFOLIO SAVINGS

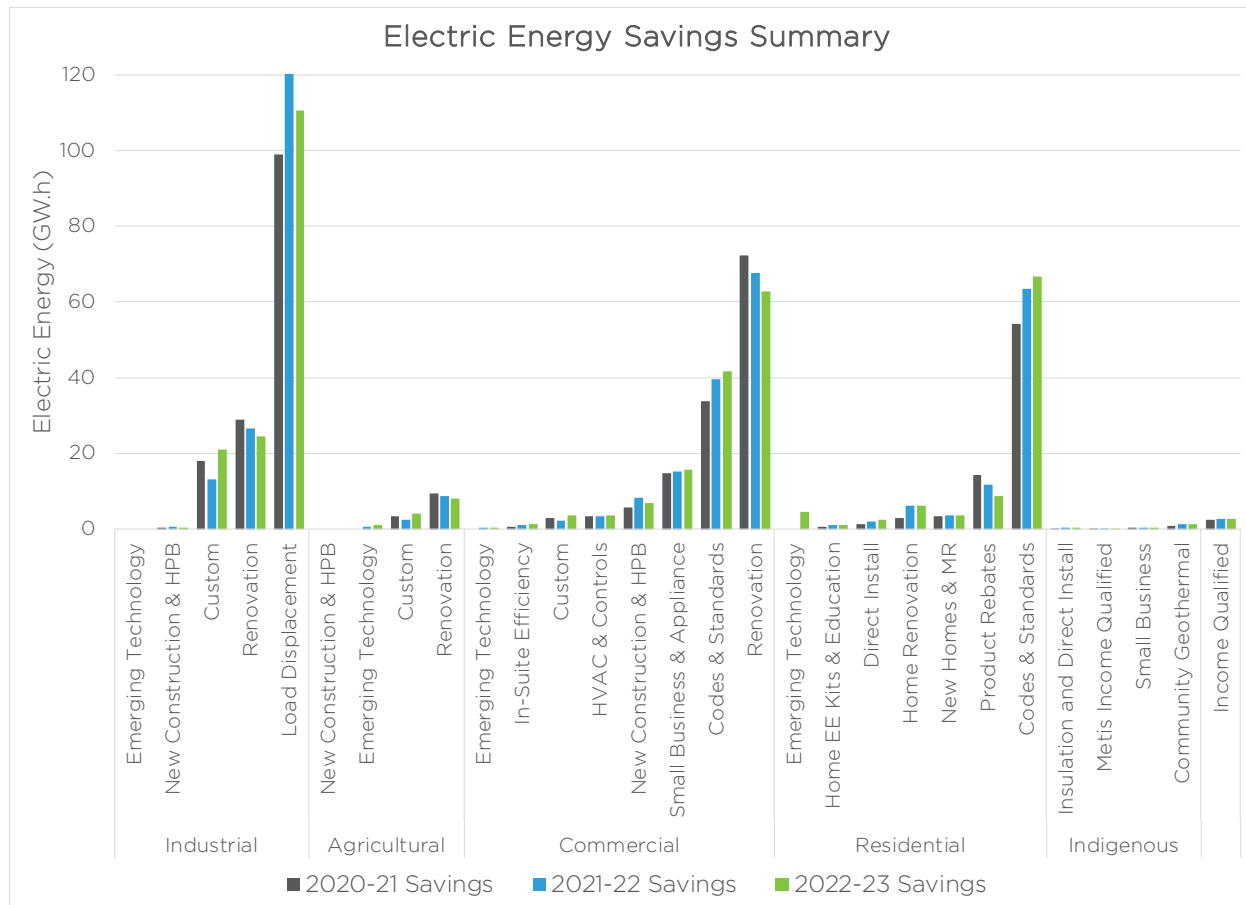
	2020/21	2021/22	2022/23	Average
Annual program electric savings (GWh)	285	300	295	293
Codes and standards (GWh)	88	103	108	100
Total electric savings (GWh)	373	403	403	393
Savings as a percent of electric load	1.43%	1.55%	1.56%	1.51%
Annual capacity savings (MW)	85	93	93	90

Note. Electric energy and capacity savings determined at generation.

October 25, 2019

16 contribution of codes and standards savings. *Attachment 3* provides the detailed
17 program bundle annual electricity energy and capacity savings tables.

FIGURE A3.2 ELECTRIC ENERGY SAVING SUMMARY - ANNUAL PROGRAM BUNDLE SAVINGS BY CUSTOMER SEGMENT



A3.1.3 ANNUAL NATURAL GAS PORTFOLIO ENERGY SAVINGS

18 Table A3.2 provides the annual and overall average natural gas savings in millions of
19 cubic meters (million m³) and as a percentage of natural gas consumption volumes.
20 Shown are gross program impacts, the contribution of codes and standards, and
21 program interactive effects resulting from the electric portfolio. Also shown in Table
22 A3.2 are the annual greenhouse gas (GHG) emission reductions resulting from the
23 natural gas portfolio.

October 25, 2019

TABLE A3.2 2020/23 EFFICIENCY PLAN SUMMARY – NATURAL GAS PORTFOLIO SAVINGS

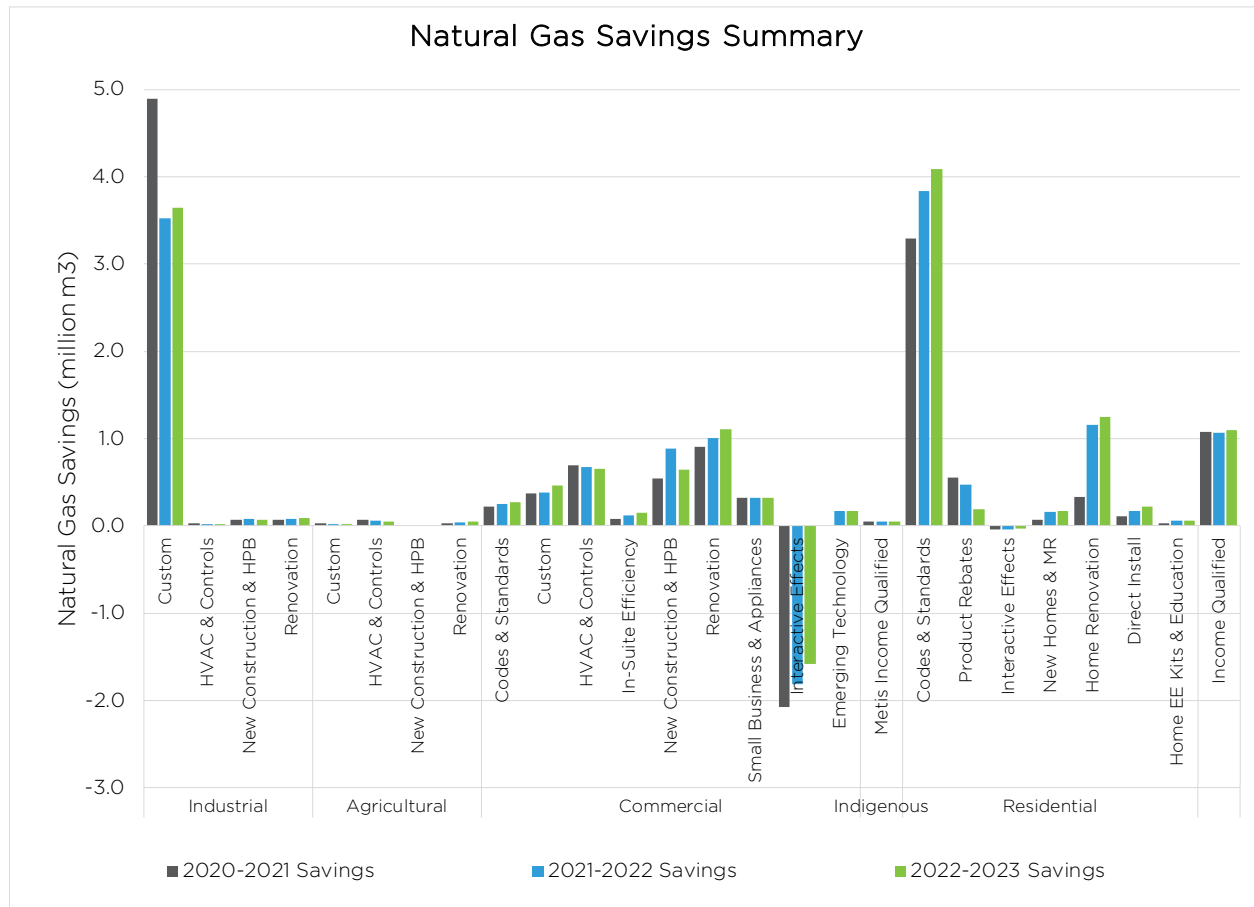
	2020/21	2021/22	2022/23	Average
Annual gross program natural gas savings (million m ³)	10.3	10.5	10.5	10.4
Codes and standards (million m ³)	3.5	4.1	4.4	4.0
Program interactive effects (million m ³)	-2.1	-1.8	-1.6	-1.9
Net annual natural gas savings (million m ³)	11.7	12.8	13.2	12.6
Savings as a percent of natural gas volume	0.72%	0.79%	0.82%	0.78%
Annual GHG savings (tonnes CO _{2e})	22,000	24,000	25,000	24,000

Note. After consideration of electric programming interactive effects.

A3.1.4 NATURAL GAS PROGRAM BUNDLE ENERGY SAVINGS

24 This section further provides a perspective on the data presented in Table A3.2 with
 25 respect to the individual customer segments, codes and standards, program bundle
 26 contributions, and interactive effects of the electric portfolio towards achieving the
 27 net natural gas annual savings targets. Figure A3.3 illustrates the annual natural gas
 28 savings in million m³ for each customer segment inclusive of all program bundles. The
 29 program bundle totals are net of any interactive effects, and the relative contribution
 30 of codes and standards related savings.

FIGURE A3.4 NATURAL GAS SAVINGS SUMMARY - ANNUAL PROGRAM BUNDLE SAVINGS BY CUSTOMER SEGMENT



A3.2 BUDGET

A3.2.1 ANNUAL ELECTRIC PORTFOLIO PROJECTED BUDGET

36 Table A3.3 shows the annual budget required to deliver the electric portfolio,
 37 including overall programming, enabling strategies, and corporate overhead costs.
 38 Section 4 provides additional analysis and details of the enabling strategies and the
 39 corporate overhead budget.

REFERENCE:

Appendix A – Section A7 – Commercial, Industrial & Agricultural Programs & Attachment 3 – Technical Tables, pdf pages 506 - 518

PREAMBLE TO IR (IF ANY):**QUESTION:**

- a. Please provide a general description of why the Annual Electric Energy Savings from Custom Offers declines in 2021/22 compared 2020/21 (ref: Table A7.12, pdf page 395 of 591), especially given both years have the same amount of projects. Please indicate the role and amount of savings persistence, if any, in the decline.
- b. As per (a) above, If savings persistence is not included in Table A7.12, please provide a separate row for savings persistence included in any cost-effectiveness calculations.
- c. Please provide a general description why the Annual Electric Energy Savings from Load Displacement declines from 120.52 GWh in 2021/22 to 110.45 GWh in 2022/23 (ref: Table A7.14, pdf page 399 of 591).
- d. Please provide a narrative description, as well as supporting mathematical calculations if possible, for how the Annual capacity savings (MW) benefit of the Load Displacement Program (ref: Table A7.14, pdf page 399 of 591) is included in the calculation of DSM program metrics for this program, if at all.
- e. EM's plan includes <10 Load Displacement projects in each year of the plan as per Table A7.14 (pdf page 399 of 591). What proportion of load displacement projects and annual savings by costs/activities is represented as pursued by EM with signed agreements following the in-service of EM, versus ongoing savings from past load displacement agreements signed with Manitoba Hydro?
- f. Please explain, with calculations, why the "Custom Offers" industrial program saves an average \$1.245 million/year in customer bills (pdf page 517 of 591) on a load reduction of 17.9 to 28.6 GW.h/year (pdf page 513 of 591) an average of 5.2 cents/kW.h, while the load displacement program saves an average of \$1.983 million/year in customer bills (pdf page 517 of 591) on a load reduction of 99.0 to 120.5 GW.h/year (pdf page 513 of 591) an average of only 1.8 cents/kW.h in customer bill savings.

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- g. Given the levelized cost of industrial programming is generally well below many programming options for other classes (per Figure A3.7, pdf page 261 of 591), please describe the evaluation and decision-making process of EM to include higher cost programs (e.g., residential direct install or home renovation) as opposed to added program scope or magnitude in lower cost programs (e.g., industrial customer, load displacement, renovation, or equivalent lower cost agricultural or commercial program offerings). Please indicate all quantitative considerations for determining the level of investment in programs of materially different cost metrics.
- h. Please provide a revised assessment of the plan metrics (including annual energy savings, savings percent and annual acquisition costs) in the event all Residential, Commercial, Industrial and Agricultural programs above 3.14 cents/kW.h levelized cost were eliminated from the plan (not Indigenous or Income Qualified), including the savings target that would be achieved and the revised PACT ratio, NPV and levelized cost of the portfolio (as shown in Table 5.3, pdf page 135 of 591) and LRI impact (Table 5.6 on pdf page 139 of 591). Please indicate whether any resulting changes would arise in respect of the EM overhead and support costs that could arise in this situation and include this reduction in the calculation of revised metrics.

RATIONALE FOR QUESTION:

MIPUG wishes to understand the assumptions made regarding the level of participation, cost and benefits for commercial and industrial programs.

RESPONSE:

- a) The decrease in electric energy savings between the 2020/21 and 2021/22 is due to the timing of large industrial energy efficiency projects within the Custom Program Bundle. In these instances, there are a relatively few projects which are impacting variations in annual electric energy savings and anticipated budget. Due to the small number of customers participating within the Customer Offers along with installation verification program requirements, the savings persistence factor (see definition in 2020/23 Efficiency Plan, Attachment 1.2, p. 444 of 591) is taken as 100% for these projects.
- b) Please see MIPUG/EM I-2a.

- c) The reason for the decrease in electric energy savings between the 2021/22 and 2022/23 is due to the timing of large industrial energy efficiency projects within the Load Displacement Offer.
- d) Please see DAYMARK/EM I-20.
- e) Efficiency Manitoba has included one agreement and ongoing savings from a past load displacement agreement signed with Manitoba Hydro. See PUB/EM 1-31.
- f) As outlined in MIPUG/EM I-1a, in the case of the Load Displacement program, activities within the Plan include operating contribution commitments including new annual energy savings and operating incentives throughout the duration of the project. This impacts the incremental energy volumes that should be used when calculating the average rate of customer bill savings (cents/kW.h) requested within this information request. To illustrate, in the case of the Load Displacement program the average rate of customer bill savings of \$1.983 million corresponds to an average energy savings of 44 GWh [namely $(99 + 21.5 + 11.5 \text{ GWh})/3$ or 44 GWh]. This results in an average customer bill savings of \$0.045/kWh.
- g) The level of programming offered to the industrial, commercial and agricultural segment was not limited by the inclusion of higher cost programs in the residential market segment. Efficiency Manitoba is aiming to pursue all energy savings opportunities in order to meet the legislated energy savings targets as well as the legislated consideration of ensuring that initiatives are available to all Manitobans. Efficiency Manitoba will continue working with MIPUG and their members either directly or through the activities of the Energy Efficiency Advisory Group to identify energy savings opportunities of mutual benefit to customers and Efficiency Manitoba.
- h) The following tables provide the electric portfolio results provided that the following Program Bundles (with electric program administrator cost test levelized costs above 3.14 cents/kWh) are removed from the electric portfolio:
- Residential Direct Install (removed)

- Residential Product Rebates (removed)
- Residential Home Renovation (removed)

As noted in PUB/EM I-11a, the electric portfolio PACT results have been revised for the Indigenous Small Business and the commercial, industrial and agricultural Small Business & Appliances program bundles. The corrected values are highlighted.

The requested lifecycle rate impact analysis does not exist and would require scenario analysis and modelling which cannot be produced with reasonable effort in the time available.

REFERENCE:

EM 3-year Efficiency Plan (“3-year Plan”), Section 5 and Attachment 3 – Technical Tables, pdf pages 24 – 28 and 506 - 518

PREAMBLE TO IR (IF ANY):

EM states on pdf page 24 that:

The Program Administrator Cost Test (PACT) has been used to evaluate the investments required to deliver the portfolio of energy efficiency programs and the resulting respective electric or natural gas benefits to Manitoba Hydro resulting from those savings.

Further EM states on pdf page 26 that:

In order to assess the long-term cost-effectiveness of the Plan, Efficiency Manitoba has included only the costs and benefits from activities directly associated with the three-years of the Plan (for both the electric and natural gas portfolios). The PACT analysis considers the net present value of benefits, costs, and energy.

EM provides PACT metrics and some supporting figures in Attachment 3 to its filing.

QUESTION:

- a. Please confirm that for the purposes of calculating cost:benefit ratios (PACT), only the costs related to the current 3-year Plan are included in the calculation.
- b. In respect of (a) above, please indicate if any of the programming has costs tied to the current 3-year Plan, but which occur in years 4 or beyond (e.g., ongoing incentive payments) or that have already been spent. If so, please identify each program bundle to which this applies, along with the scale and duration of payments. If the information cannot be provided due to CSI, please separately provide at least the full NPV of the payments for any years prior to 4-15 and for the period for years 16-30. Please indicate if these costs were included in the program economic evaluation metric calculations.
- c. Please confirm that all NPV calculations, except where specified, use a discount rate of 6% nominal.

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- d. Please confirm that an overall PACT ratio of 3.27 for overall electric portfolio metrics and an NPV of \$345 million (per Table 5.3, pdf page 135 of 591) is consistent with an NPV of costs of approximately \$152 million and an NPV of benefits of approximately \$497 million. If not, please provide the relevant values.
- e. Please provide the full calculation of the levelized energy cost (cents/kW.h, per Tables 5.3 and 5.5, pdf pages 135-136 of 591) showing the year-by-year values for costs and for energy volumes for each of the 30 years, along with the calculations of the discounted values.
- f. On the basis of EM's Electric programming metrics, please confirm that at an NPV of costs on the order of \$150 million for the 3 years, a levelized cost of energy of 2.24 cents/kW.h is consistent with a 30-year levelized energy volume of approximately 6.8 TW.h. If not confirmed, please provide correct values.
- g. Per (f) above, please indicate how annual savings of approximately 400 GW.h/year, less persistence effects over 30 years, can yield 6.8 TW,h of levelized savings at a discount rate of 6%. Please provide supporting calculations. Please also indicate if the discount rate used for energy levelization is a real rate or a nominal rate.
- h. For each program bundle identified in Attachment 3 (both electricity and natural gas), please indicate the maximum years of benefits being claimed, and in which year of the 30-year horizon savings persistence effects i) start to decline from the year previous and, ii) lead to minimal or zero ongoing benefits.
- i. Please provide all justification for use of a 6% nominal discount rate. Please specifically address the choice of this rate in relation to other alternative rates, such as Manitoba Hydro's real Weighted Average Cost of Capital (WACC), which at the time of NFAT (2013) was 5.4% real (per PUB report on NFAT, page 138 of 306).
- j. Please discuss the perspective of the Board's independent expert at NFAT (Morrison Park Advisors) as described at page 157 of the PUB report on NFAT (available online: http://www.pubmanitoba.ca/v1/nfat/pdf/finalreport_pdp.pdf), that "Since minimizing cost to ratepayers is a priority, use of the discount rate seems better focused on the comparison of ratepayer costs over time" and indicate if Efficiency Manitoba considers a 6% nominal discount rate to be representative of ratepayer costs over time. Please also provide the Cost Effectiveness Metrics for the portfolio, in the same format as Attachment 3 tables at a discount rate of 10% nominal for both natural gas and electricity (consistent with the PUB's NFAT report discussion at page 178 of 306).

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- k. Please provide supporting Tables similar to provided in Attachment 3 for the PACT Sensitivity Analysis undertaken for nominal discount rate and time horizon provided in Table 5.5
- l. For Table 5.5 compared to Table 5.3 (pdf pages 135-136 of 591), please confirm that the NPV of costs under the 15 years scenario does not change as compared to the 30-year scenario, since all costs included are in years 1-3. If this is not true, please explain and quantify.
- m. For Table 5.5 compared to Table 5.3 (pdf pages 135-136 of 591), please confirm that the reduction in PACT NPV from \$345 million under a 30 years NPV to \$303 million under a 15-year NPV is entirely due to the fact that \$42 million of NPV relates to benefits arising in years 16-30.
- n. Per (m) above, please provide the undiscounted sum of benefits for years 16-30 and specifically note if this is in real or nominal dollars.
- o. Please provide all values used in the calculation of the Lifecycle Revenue Impact (LRI) measure, to yield the results per Table 5.6 (pdf page 139 of 591). Please indicate for each input if the value is in real or nominal dollars, and if not otherwise referenced in the EM application, please provide reconciliation to values already produced by EM such as lost revenue and energy savings.
- p. Please provide a description and calculation of how LRI differs from the Rate Impact Measure (RIM) test as described in previous Manitoba Hydro literature (e.g., Appendix 8.1 of the 2015/16 & 2016/17 General Rate Application, pdf pages 77-84 of 86). Please provide a calculation of the RIM measure for the portfolio and per program bundle in the same format as Attachment 3 tables.
- q. Please provide the input values and calculation at the portfolio level and program bundle level of all metrics noted in Appendix 8.1 of the 2015/16 & 2016/17 General Rate Application (pdf pages 77-84 of 86) or note which variables are not available for calculation and provide the reason the variables are not available.
- r. Per Table 5.5 (pdf page 136 of 591), please provide equivalent “time horizon” values for each of 5 years, 10 years, 20 years and 25 years.

RATIONALE FOR QUESTION:

EM relies on economic evaluation to justify programming choices. MIPUG wishes to understand the underlying inputs and supporting analysis that EM used to assess the cost-effectiveness of the proposed plan.

RESPONSE:

- a. Confirmed as per page 231 of the submission, for calculating PACT, only the costs related to activities identified within the 2020/23 Efficiency Plan (“Plan”) are included in the calculation. With one exception, there are no incremental (additional) annual energy savings or associated incremental costs that exist beyond year 3 of the Plan. In the case of the Load Displacement program, activities within the Plan include operating contribution commitments including new annual energy savings and operating incentives throughout the duration of the project.
- b. As outlined in MIPUG/EM I-1a, there are ongoing incentive costs and associated energy savings beyond year 3 of the Plan associated with the Load Displacement Program. These costs and benefits were included within the program administrator cost test (PACT) analysis. Efficiency Manitoba has provided a PACT sensitivity analysis for a 15-year time horizon in Table 5.5 (Plan, Section 5.2, p. 137 of 591). Efficiency Manitoba has provided the corresponding load displacement program electronic workpapers to Daymark based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark.
- c. Confirmed as per p. 128 of 591 (line 19) of the submission, NPV calculations used a nominal discount rate of 6%.
- d. Confirmed. Please see PUB/EM I-11 for additional detail of PACT costs and benefits by program bundle and overall portfolio.
- e. Efficiency Manitoba has provided the corresponding electronic workpapers to Daymark to enable a detailed review of the Efficiency Plan based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark.

- f. Confirmed. Please see PUB/EM I-11 for additional detail of PACT costs and benefits by program bundle and overall portfolio.
- g. The 30-year levelized energy volume confirmed would include energy savings persistence effects for each measure included within program bundles for each year. Efficiency Manitoba has provided the corresponding calculation electronic workpapers to Daymark based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark. Please also see MIPUG/EM I-5a.
- h. Efficiency Manitoba has provided the corresponding electronic workpapers to Daymark to enable a detailed review of the Efficiency Plan based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark. Please see DAYMARK/EM I-85.
- i. Section A2.3.1 identifies that discount rates used were provided by Manitoba Hydro (Plan, p. 231 of 591). Table A2.3 (Plan, p. 232 of 591) provides the real weighted average cost of capital and inflation components required to determine the nominal weighted average cost of capital (discount rate used for the PACT). Given that Manitoba Hydro is funding the Plan, Efficiency Manitoba determined that use of Manitoba Hydro's discount rate would be appropriate.
- j. The requested analysis of the NFAT report referenced does not exist and would require analysis which cannot be produced with reasonable effort in the time available. Efficiency Manitoba is able to estimate the electric portfolio metrics shown in Table 5.3 (Plan, Section 5.2, p. 135 of 591) for the electric portfolio using a discount rate of 10% as shown below:

	PACT ratio	PACT NPV	PAC Levelized Cost
Overall portfolio metrics (Table 5.3, using discount rate of 6%)	3.27	\$345 million	2.24¢/kWh
Overall portfolio metrics (using requested discount rate of 10%)	2.68	\$240 million	3.00¢/kWh

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Efficiency Manitoba is able to estimate the natural gas portfolio metrics shown in Table 5.3 (Plan, Section 5.4, p. 136 of 591) for the natural gas portfolio using a discount rate of 10% as shown below:

	PACT ratio	PACT NPV	PACT Levelized Cost
Overall portfolio metrics (Table 5.4, using discount rate of 6%)	0.99	(\$0.8 million)	18.69¢/m ³
Overall portfolio metrics (using requested discount rate of 10%)	0.72	(\$16 million)	28.80¢/m ³

- k. The requested analysis does not exist and would require scenario analysis and modelling which cannot be produced with reasonable effort in the time available. Efficiency Manitoba has provided the corresponding electronic workpapers to Daymark to enable a detailed review of the Efficiency Plan based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark.
- l. Efficiency Manitoba has provided the corresponding electronic workpapers to Daymark to enable a detailed review of the Efficiency Plan based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark. For Table 5.5 (Plan, Section 5.2, p. 136 of 591) compared to Table 5.3 (Plan, Section 5.2, p. 135 of 591), the NPV of costs under the 15 years scenario does change (by less than 1%) as compared to the 30-year scenario. Please see MIPUG/EM I-1a for an explanation of Load Displacement operating incentive costs that exist beyond year 3 in the Plan and included within the PACT analysis.
- m. Not confirmed. Please see MIPUG/EM I-1i.
- n. Efficiency Manitoba has provided the corresponding electronic workpapers to Daymark to enable a detailed review of the Efficiency Plan based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark.

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- o. As shown in Section A2.3.2 (Plan, Appendix A2, p. 234 of 591) the following equation is used to determine the Lifecycle Rate Impact (“LRI”).

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

The present values used in the calculation of the LRI include the following:

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

- p. The Manitoba Hydro Power Smart Plan 2014 to 2017: Supplemental Report: 15 yr (2014 to 2029) (available at <http://www.pubmanitoba.ca/v1/exhibits/mh-gra-2015-16-17/Appendix%208.1.pdf>) provides the following equation used to determine the Rate Impact Measure (RIM):

$$\text{RIM} = \frac{(\text{PV) Utility Marginal Benefits}}{\text{PV(Revenue loss + Utility Program Costs + Incentives)}}$$

Please refer to MIPUG/EM I-1q for calculation of the RIM measure for program bundle and portfolio.

- q. This question is requesting that the input values and calculations at both the program bundle and portfolio level be provided for the following metrics identified in the Manitoba Hydro Power Smart Plan 2014 to 2017: Supplemental Report: 15 yr (2014 to 2029) (available at <http://www.pubmanitoba.ca/v1/exhibits/mh-gra-2015-16-17/Appendix%208.1.pdf>). The requested analysis does not exist and would require scenario analysis and modelling which cannot be produced with reasonable effort in the time available.

PUB/EM I-11 provides the electric and natural gas portfolio cost effectiveness results for the program administrator cost test (PACT); total resource cost test (TRC); participating customer cost test (PC); simple customer payback; and rate impact measure (RIM) for each initiative in the Plan.

**2020-2023 Efficiency Plan
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- r. Efficiency Manitoba is able to estimate the electric portfolio metrics shown in Table 5.3 (Plan, Section 5.2, p. 135 of 591) for the electric portfolio using the requested “time horizon” values of 5, 10, 20 and 25 years as shown below:

	PACT ratio	PACT NPV	PAC Levelized Cost
Overall portfolio metrics (Table 5.3, using 30 years)	3.27	\$345 million	2.24¢/kWh
Overall portfolio metrics (using requested 5 years)	1.19	\$27 million	5.5¢/kWh
Overall portfolio metrics using requested 10 years)	2.37	\$201 million	2.9¢/kWh
Overall portfolio metrics (using requested 20 years)	3.16	\$328 million	2.3¢/kWh
Overall portfolio metrics (using requested 25 years)	3.24	\$339 million	2.3¢/kWh

Efficiency Manitoba is able to estimate the natural gas portfolio metrics shown in Table 5.3 (Plan, Section 5.4, p. 136 of 591) for the natural gas portfolio using the requested “time horizon” values of 5, 10, 20 and 25 years as shown below:

	PACT ratio	PACT NPV	PACT Levelized Cost
Overall portfolio metrics (Table 5.4, using 30 years)	0.99	(\$0.8 million)	18.69¢/m ³
Overall portfolio metrics (using requested 5 years)	0.24	(\$45 million)	64.8¢/m ³
Overall portfolio metrics using requested 10 years)	0.51	(\$29 million)	32.7¢/m ³
Overall portfolio metrics (using requested 20 years)	0.83	(\$10 million)	21.5¢/m ³
Overall portfolio metrics (using requested 25 years)	0.95	(\$3 million)	19.3¢/m ³

1.3 Power Smart Programs

The following table provides program durations and cumulative participation for incentive based and financial loan programs over the 15 year planning horizon. For program descriptions, please refer to the current approved DSM plan (2015/16 Power Smart Plan). For programs not approved but where placeholders are used, detail program descriptions are not available at this time.

Program Duration and Cumulative Participation
2015/16 - 2029/30

Programs	Program Category	Electric	Natural Gas	Program Launch Date	Participation Definition	Cumulative Participation by 2029/30
Residential						
New Home Program	Incentive Based	✓	✓	Apr-2017	No. of houses	1,381
Home Insulation Program	Incentive Based	✓	✓	May-2004	No. of houses	58,505
Water and Energy Saver Program	Incentive Based	✓	✓	Sep-2010	No. of houses	201,247
Affordable Energy Program	Incentive Based	✓	✓	Dec-2007	No. of retrofits	45,843
Refrigerator Retirement Program	Incentive Based	✓		Jun-2011	No. of appliances	55,017
Drain Water Heat Recovery Initiative	Incentive Based	✓		Apr-2015	No. of houses	1,856
Residential LED Lighting Program	Incentive Based	✓		Apr-2014	No. of bulbs	1,089,561
Community Geothermal Program	Incentive Based	✓		Apr-2013	No. of geothermal systems	3,972
Power Smart Residential Loan	Financial Loan	✓	✓	Feb-2001	No. of loans	161,059
Power Smart PAYS Financing	Financial Loan	✓	✓	Nov-2012	No. of loans	7,252
Residential Earth Power Loan	Financial Loan	✓	✓	Apr-2002	No. of loans	3,885
Commercial						
Commercial Lighting Program	Incentive Based	✓		Apr-1992	No. of projects	20,463
LED Roadway Lighting Conversion Program	Incentive Based	✓		Apr-2014	No. of conversions	155,133
Commercial Building Envelope - Windows Program	Incentive Based	✓	✓	Dec-1995	No. of projects	5,124
Commercial Building Envelope - Insulation Program	Incentive Based	✓	✓	Dec-1995	No. of projects	5,170
Commercial Geothermal Program	Incentive Based	✓		Dec-1995	No. of buildings	1,066
Commercial HVAC Program - Boilers	Incentive Based	✓	✓	Sep-2003	No. of boilers	2,728
Commercial HVAC Program - Chillers	Incentive Based	✓		Sep-2003	No. of chillers	184
Commercial HVAC Program - CO2 Sensors	Incentive Based	✓	✓	Apr-2009	No. of sensors	2,128
Commercial HVAC Program - HRVs	Incentive Based	✓	✓	Apr-2016	No. of units	276
Commercial HVAC Program - Air Cooled Chillers	Incentive Based	✓		Apr-2017	No. of chillers	338
Commercial HVAC Program - Water Heaters	Incentive Based	✓	✓	Apr-2015	No. of water heaters	1,018
Commercial Custom Measures Program	Incentive Based	✓	✓	Dec-1995	No. of projects	384
Commercial Building Optimization Program	Incentive Based	✓	✓	Apr-2006	No. of buildings	164
New Buildings Program	Incentive Based	✓	✓	Apr-2009	No. of buildings	246
Commercial Refrigeration Program	Incentive Based	✓		Apr-2006	No. of locations	3,673
Commercial Kitchen Appliance Program	Incentive Based	✓	✓	Jan-2008	No. of appliances	2,681
Network Energy Management Program	Incentive Based	✓		May-2008	No. of licenses	30,036
Internal Retrofit Program	Incentive Based	✓	✓	Jul-1995	No. of projects	1,499
Power Smart Shops	Incentive Based	✓	✓	Feb-2009	No. of projects	5,708
Power Smart Energy Manager	Incentive Based	✓	✓	Apr-2015	No. of managers	3
Power Smart for Business PAYS Financing	Financial Loan	✓	✓	Sep-2013	No. of loans	418
Industrial						
Performance Optimization Program	Incentive Based	✓		Jun-1993	No. of projects	3,018
Natural Gas Optimization Program	Incentive Based		✓	Sep-2006	No. of projects	221
Load Management						
Curtable Rate Program	Incentive Based	✓		Nov-1993	No. of customers	97 *
Load Displacement & Alternative Energy						
Bioenergy Optimization Program	Incentive Based	✓	✓	Mar-2006	No. of projects	231
Customer Sited Load Displacement	Incentive Based	✓		Apr-2014	No. of customers	28
Conservation Rates						
	Rate Based	✓		2018/19	Rate Based	-
Fuel Choice						
	Incentive Based	✓		2017/18	No. of installations	15,720
Other Emerging Technologies						
Residential Air Source Heat Pumps Program	Incentive Based	✓		2021/22	No. of projects	1,035
Residential Future Opportunities	Incentive Based	✓		2020/21	Various	Various
Residential Solar Photovoltaics Program (PV)	Incentive Based	✓		2020/21	No. of systems	26,402
Residential Solar Thermal Program - Water Heating	Incentive Based	✓		2017/18	No. of systems	1,199
Residential Solar Thermal Program - Pool Heating	Incentive Based	✓	✓	2017/18	No. of systems	1,116
Commercial Future Opportunities	Incentive Based	✓		2020/21	Various	Various
Commercial Solar Photovoltaics Program (PV)	Incentive Based	✓		2020/21	No. of systems	1,519
Commercial Variable Speed and Frequency Drives	Incentive Based	✓		2017/18	No. of drives	569
Industrial Future Opportunities	Incentive Based	✓		2020/21	Various	Various

*Participation recurs annually

1.3 Power Smart Programs

The following table provides program durations and cumulative participation for incentive based and financial loan programs over the 15 year planning horizon. For program descriptions, please refer to the current approved DSM plan (2016/17 Demand Side Management Plan). For programs not approved but where placeholders are used, detail program descriptions are not available at this time.

Program Duration and Cumulative Participation
(2016/17 - 2030/31)

Programs	Program Category	Electric	Natural Gas	Program Launch Date	Participation Definition	Cumulative Participation by 2030/31
Residential						
New Homes Program	Incentive Based	✓	✓	Apr-2016	No. of houses	38,856
Home Insulation Program	Incentive Based	✓	✓	May-2004	No. of houses	60,440
Water and Energy Saver Program	Incentive Based	✓	✓	Sep-2010	No. of houses	231,427
Affordable Energy Program	Incentive Based	✓	✓	Dec-2007	No. of retrofits	58,238
Refrigerator Retirement Program	Incentive Based	✓		Jun-2011	No. of appliances	82,737
Drain Water Heat Recovery Initiative	Incentive Based	✓		Dec-2014	No. of houses	251
Residential LED Lighting Program	Incentive Based	✓		Oct-2014	No. of bulbs	2,106,479
Community Geothermal Program	Incentive Based	✓		Jun-2013	No. of systems	3,549
Appliances	Incentive Based	✓	✓	Sep-2016	No. of appliances	2,800
HRV Controls	Incentive Based	✓	✓	Apr-2016	No. of controllers	18,102
Power Bars	Incentive Based	✓		Sep-2016	No. of power bars	200
Smart Thermostats	Incentive Based	✓	✓	Apr-2016	No. of thermostats	17,350
Plug-in Timers	Incentive Based	✓		Sep-2016	No. of timers	17,600
Community Energy Plan	Incentive Based	✓	✓	Apr-2016	-	0
Power Smart Residential Loan	Financial Loan	✓	✓	Feb-2001	No. of loans	157,198
Power Smart PAYS Financing	Financial Loan	✓	✓	Nov-2012	No. of loans	5,561
Residential Earth Power Loan	Financial Loan	✓	✓	Apr-2002	No. of loans	1,276
Commercial						
Commercial Lighting Program	Incentive Based	✓		Apr-1992	No. of projects	29,594
LED Roadway Lighting Conversion Program	Incentive Based	✓		Feb-2013	No. of conversions	151,804
Commercial Building Envelope - Windows Program	Incentive Based	✓	✓	Dec-1995	No. of projects	3,960
Commercial Building Envelope - Insulation Program	Incentive Based	✓	✓	Dec-1995	No. of projects	5,680
Commercial Geothermal Program	Incentive Based	✓		Dec-1995	No. of buildings	555
Commercial HVAC Program - Boilers	Incentive Based	✓	✓	Sep-2003	No. of boilers	1,930
Commercial HVAC Program - Chillers (Water-Cooled)	Incentive Based	✓		Sep-2003	No. of chillers	106
Commercial HVAC Program - CO2 Sensors	Incentive Based	✓	✓	Apr-2009	No. of sensors	2,787
Commercial HVAC Program - HRVs	Incentive Based	✓	✓	Apr-2016	No. of units	631
Commercial HVAC Program - Air Cooled Chillers	Incentive Based	✓		Apr-2017	No. of units	498
Commercial HVAC Program - Water Heaters	Incentive Based	✓	✓	Apr-2015	No. of water heaters	991
Commercial Custom Measures Program	Incentive Based	✓	✓	Dec-1995	No. of projects	443
Commercial Building Optimization Program	Incentive Based	✓	✓	Apr-2006	No. of buildings	139
New Buildings Program	Incentive Based	✓	✓	Apr-2009	No. of buildings	2,003
Commercial Refrigeration Program	Incentive Based	✓		Apr-2006	No. of locations	7,547
Commercial Kitchen Appliance Program	Incentive Based	✓	✓	Jan-2008	No. of appliances	2,775
Network Energy Management Program	Incentive Based	✓		May-2008	No. of licenses	9,346
Internal Retrofit Program	Incentive Based	✓	✓	Jul-1995	No. of projects	2,168
Power Smart Energy Manager	Incentive Based	✓	✓	Apr-2000	No. of projects	48
Power Smart Shops	Incentive Based	✓	✓	Feb-2009	No. of projects	5,638
Race to Reduce	Marketing Promotion	✓	✓	Aug-2016	No. of buildings	58
Parking Lot Controller	Incentive Based	✓		Jun-2016	No. of controllers	1,131
Power Smart for Business PAYS Financing	Financial Loan	✓	✓	Sep-2013	No. of loans	553
Industrial						
Performance Optimization Program	Incentive Based	✓		Jun-1993	No. of projects	3,086
Natural Gas Optimization Program	Incentive Based		✓	Sep-2006	No. of projects	255
Load Management						
Curtable Rate Program	Incentive Based	✓		Jun-1993	No. of customers	100*
Load Displacement & Alternative Energy						
Bioenergy Optimization Program	Incentive Based	✓	✓	Mar-2006	No. of projects	229
Customer Sited Load Displacement	Incentive Based	✓		Apr-2014	No. of customers	15
Conservation Rates						
Conservation Rates - Residential	Rate Based	✓		2017/18	Rate Based	-
Conservation Rates - Commercial	Rate Based	✓		2017/18	Rate Based	-
Fuel Choice						
Fuel Choice	Incentive Based	✓		2017/18	No. of installations	15,720
Other Emerging Technologies						
Residential Air Source Heat Pumps Program	Incentive Based	✓		2021/22	No. of Heat Pumps	1,225
Residential Future Opportunities	Incentive Based	✓		2020/21	Various	Various
Residential Solar Photovoltaics Program (PV)	Incentive Based	✓		2020/21	No. of Systems	11,740
Residential Solar Thermal Program - Water Heating	Incentive Based	✓		2017/18	No. of systems	102
Residential Solar Thermal Program - Pool Heating	Incentive Based	✓	✓	2017/18	No. of systems	891
Commercial Future Opportunities	Incentive Based	✓		2020/21	Various	Various
Commercial Solar Photovoltaics Program (PV)	Incentive Based	✓		2020/21	No. of Systems	1,848
Commercial Variable Speed and Frequency Drives	Incentive Based	✓		2017/18	No. of drives	490
Industrial Future Opportunities	Incentive Based	✓		2020/21	Various	Various

*Participation recurs annually

DEMAND SIDE MANAGEMENT PLAN

The 2019/20 DSM Plan was developed through an intensive planning process and it offers programs and initiatives to pursue opportunities in all market sectors; residential, commercial, and industrial. These programs are designed based on in-depth knowledge of the technology and the market environment. An in-depth understanding is essential to ensure that the program design is adequately and effectively addressing the appropriate target market and contains the tools and strategies to address market barriers. The following table outlines the forecasted achievements for 2019/20:

Programs	Participation Definition	2019/20 Participation	Capacity Savings (MW)	Energy Savings (GW.h)	Natural Gas Savings (million m ³)	Utility Investment (millions \$)
New Homes Program	No. of houses	380	1.6	3.2	0.1	\$1.1
Home Insulation Program	No. of houses	1,658	1.4	3.0	0.5	\$2.6
Water and Energy Saver Program	No. of houses	13,275	0.2	2.0	0.5	\$1.0
Affordable Energy Program	No. of retrofits	2,118	0.8	2.4	0.9	\$6.3
Refrigerator Retirement Program	No. of appliances	6,150	0.7	6.5	-	\$1.5
Residential LED Lighting Program	No. of bulbs	566,157	3.9	12.3	-	\$1.7
Community Geothermal Program	No. of systems	75	0.6	1.1	-	\$0.5
Appliances	No. of appliances	5,550	0.1	1.2	0.0	\$0.5
Power Bars	No. of power bars	600	0.0	0.0	-	\$0.0
Smart Thermostats	No. of thermostats	3,250	0.2	0.3	0.2	\$0.3
Plug-in Timers	No. of timers	5,000	0.0	0.3	-	\$0.0
Home Energy Efficiency Loan	No. of loans	3,729	0.1	0.3	0.4	\$0.0
PAYS Financing	No. of loans	26	0.0	0.1	0.0	\$0.0
Residential Earth Power Loan	No. of loans	47	0.3	0.7	0.0	\$0.0
Residential Programs			9.9	33.3	2.5	\$15.5
Commercial Lighting Program	No. of projects	1,700	15.1	63.3	-	\$10.8
LED Roadway Lighting Conversion Program	No. of conversions	24,469	1.7	12.2	-	\$12.0
Commercial Building Envelope - Windows Program	No. of projects	110	0.3	0.8	0.2	\$0.7
Commercial Building Envelope - Insulation Program	No. of projects	183	0.9	1.9	0.9	\$1.7
Commercial Geothermal Program	No. of buildings	5	0.2	0.4	-	\$0.1
Commercial HVAC Program - Boilers	No. of boilers	75	-	-	0.6	\$0.4
Commercial HVAC Program - CO2 Sensors	No. of sensors	142	0.1	0.1	0.1	\$0.2
Commercial HVAC Program - HRV/ERV	No. of units	31	0.4	0.8	0.2	\$0.5
Commercial HVAC Program - Water Heaters	No. of water heaters	12	-	-	0.0	\$0.1
Commercial Custom Measures Program	No. of projects	27	0.3	2.5	0.3	\$0.7
Enhanced Building Operations Program	No. of buildings	3	0.1	0.6	0.1	\$0.2
New Buildings Program	No. of buildings	20	1.1	3.7	0.1	\$1.7
Commercial Refrigeration Program	No. of locations	210	0.5	3.8	0.0	\$0.3
Commercial Kitchen Appliance Program	No. of appliances	19	0.0	0.1	0.0	\$0.1
Network Energy Management Program	No. of licenses	250	0.0	0.0	0.0	\$0.0
Internal Retrofit Program	No. of projects	44	0.2	1.0	0.0	\$0.5
Small Business Program	No. of projects	976	0.8	3.4	0.0	\$1.1
Manitoba Race to Reduce	No. of buildings	6	0.1	0.9	0.1	\$0.1
Commercial Programs			21.9	95.6	2.6	\$31.2
Performance Optimization Program	No. of projects	80	1.6	10.1	-	\$1.7
Natural Gas Optimization Program	No. of projects	10	-	-	1.0	\$0.4
Industrial Programs			1.6	10.1	1.0	\$2.1
Energy Efficiency Subtotal			33.4	139.1	6.0	\$48.9
Curtailable Rate Program	No. of Annual Participants	3	213.2	-	-	\$6.8
Load Management			213.2	0.0	0.0	\$6.8
Bioenergy Optimization Program	No. of projects	2	0.2	0.8	-	\$0.3
Customer Sited Load Displacement	No. of customers	1	13.8	99.0	-	\$1.0
Load Displacement & Alternative Energy			14.0	99.8	0.0	\$1.4
Residential Solar Photovoltaics Program (PV)	No. of systems	325	0.0	10.5	0.0	\$7.0
Commercial Solar Photovoltaics Program (PV)	No. of systems	70	0.0	10.6	0.0	\$6.7
Other Emerging Technologies			0.0	21.1	0.0	\$13.8
Codes, Standards & Regulations			23.1	89.7	4.7	-
Interactive Effects			-	-	-2.8	-
Program Support			-	-	-	\$2.9
Demand Side Management Plan - 2019/20			284	350	8.0	\$73.8

Industrial Sector

Manitoba Hydro invested \$10.1 million towards programs and initiatives for industrial customers in 2017/18. There were 5 industrial incentive-based programs offered to customers in 2017/18, and 106 customers participated. This activity resulted in electric savings of 136.3 GW.h and 183.6 MW, and natural gas savings of 1.6 million cubic metres.

The following table summarizes the achievements by program for the industrial sector.

INDUSTRIAL PROGRAMS	Customer Participation	2017/18 Achievements			Utility Cost
		Electric		Natural Gas	
		GW.h	MW	Millions of m ³	
Industrial Incentive-Based Programs					
Performance Optimization	92	12.7	1.7	-	\$ 2,427,372
Natural Gas Optimization	9	-	-	1.6	\$ 580,352
Industrial Incentive-Based Programs Subtotal	101	12.7	1.7	1.6	\$ 3,007,724
Industrial Discontinued Programs					
	-	-	-	-	\$ -
Customer Self-Generation Programs					
Load Displacement	2	123.5	19.4	-	\$ 330,226
Bioenergy Optimization Program	-	-	-	-	\$ 368,351
Customer Self-Generation Programs Subtotal	2	123.5	19.4	-	\$ 698,577
Rate/Load Management Programs					
Curtable Rates	3	-	162.5	-	\$ 6,420,249
Industrial Programs Total	106	136.3	183.6	1.6	\$ 10,126,550

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 they 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.

20

Creating New Demand Side Management Opportunities

6. The Panel recommends that the Government of Manitoba divest Manitoba Hydro of its responsibilities for Demand Side Management.
7. The Panel recommends that the Government of Manitoba mandate incremental annual Demand Side Management targets in the order of 1.5% of forecast domestic load (including codes and standards) over the long term.
8. The Panel recommends that the Government of Manitoba establish a regulated, independent arm's-length entity that would be responsible for developing and implementing a plan to meet the mandated Demand Side Management targets.
9. The Panel recommends that the Demand Side Management savings reported by the independent arm's-length entity be independently audited on an annual basis.
10. The Panel recommends that until the independent arm's-length entity is established, Manitoba Hydro continue to address the barriers to lower income customer participation in its Demand Side Management programs.
11. The Panel recommends that until the independent arm's-length entity is established, Manitoba Hydro proceed with its fuel switching and heating fuel choice initiatives to encourage customers to use natural gas for space and water heating.

Rates and Ratepayer Impacts

12. The Panel recommends that the Government of Manitoba direct a portion of the incremental capital taxes and water rental fees from the development of the Keeyask Project to be used to mitigate the impact of rate increases on lower income consumers, northern and aboriginal communities.
13. The Panel recommends that Manitoba Hydro relax its 75/25 debt-to-equity ratio policy to moderate its proposed electricity rate increases.
14. The Panel recommends that Manitoba Hydro implement cost containment measures to moderate its proposed electricity rate increases.

Actions in Support of a Clean Energy Future

15. The Panel recommends that integrated resource planning become a cornerstone of a new clean energy strategy for the Province of Manitoba.
16. The Panel recommends that the Government of Manitoba not approve the construction of any generating facilities, nor approve the beginning of the

REFERENCE:

19 (PDF 571) Appendix A, Attachment 5

PREAMBLE TO IR (IF ANY):

Regarding Appendix A, Attachment 5 (Evaluation Framework & Planning Report), p. 19, Table 4 lists Residential General Service Lighting as a market area for which there is “high savings potential” from Codes and Standards changes.

QUESTION:

- a) Is it EM’s position that it could have a material impact on the adoption of residential lighting standards? If so, what is the basis for that position?
- b) If it is EM’s position that it could have a material impact on residential lighting standards, what might be the nature of that impact?
- c) For how many years does EM believe that any impact it might have on residential lighting standards would last? What is the basis for that conclusion?
- d) What is the current socket saturation of screw-based LED lamps in Manitoban households, as well as the socket saturation for any of the past five years for which data are available? Please provide the source for any values provided.
- e) What is the current Manitoba market share for screw-based LED Lamps (relative to halogen, CFL and/or other residential lamp types), as well as the market share for any of the past five years for which data might be available? Please provide the source for any values provided.

RATIONALE FOR QUESTION:

To better understand Efficiency Manitoba's position that Residential General Service Lighting is a market area for which there is “high savings potential” from Codes and Standards changes.

RESPONSE:

- a) Code & standards savings for residential lighting included in the plan are attributed to federal minimum energy performance standards (MEPS) for general service lamps that came into effect in 2014. Manitoba Hydro influenced the adoption of this standard through its participation in the Strategic Lighting Initiative Committee (SLIC) - a committee created by Natural Resources Canada to support the development and implementation of the minimum energy performance standards for lighting products.
- b) The actual impact of MEPS on energy savings that will be attributed to Efficiency Manitoba will be determined by the independent assessment required under Section 16(1) of the Efficiency Manitoba Act. The forecasted savings attributed from the 2014 Residential General Service Lighting Standards are listed in Table A9.1 (2020/23 Efficiency Plan, Appendix A9, p. 435 of 591). High-savings codes and standards (including residential lighting) will be evaluated more frequently than low-saving codes. The official list of codes and standards to be evaluated will be determined prior to each evaluation cycle as described in the 2020/23 Evaluation, Measurement and Verification Framework and Plan (2020/23 Efficiency Plan, Attachment 5, p. 572 of 591).
- c) Efficiency Manitoba expects to claim savings for MEPS annually until 2024/25. The forecast of MEPS savings resulting from annual conversions of incandescent to halogen lamps is based on the estimated number of incandescent lamps remaining in the Manitoba market. The impact of residential lighting standards on the market will be permanent in nature, however Efficiency Manitoba has assumed that savings from MEPS for general service lamps will persist for one year in order to provide conservative estimates. The persistence of savings from Efficiency Manitoba's impact on MEPS will be determined by the independent assessment required under Section 16(1) of the Efficiency Manitoba Act.

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- d) The estimated socket saturation of screw-based LED bulbs in Manitoban households is summarized in the following table for all years where data is available.

Survey Administration Date / Source	Estimated number of A-line LED bulbs installed per home	Estimated number of specialty LED bulbs installed per home	Estimated total number of LED bulbs installed per home	Estimated LED socket saturation
Jul 2014 Power Smart Residential Survey administered by NRG Research Group	n/a	n/a	1.6	5%
Nov 2015 Power Smart Residential Survey administered by NRG Research Group	4.4	1.9	6.3	19%
Jan 2017 Omnibus survey administered by Prairie Research Association	8.5	4.1	12.6	37%
Dec 2017 Omnibus survey administered by Probe Research	13.7	5.4	19.1	56%

The estimated socket saturation was computed by dividing the estimated total number of LED bulbs installed per home (determined via phone surveys administered by market research vendors on behalf Manitoba Hydro) by an estimated 34 sockets per residential dwelling (derived from Manitoba installed stock data from Natural Resources Canada, 2013).

- e) The market share of installed residential lighting technologies was measured in Manitoba Hydro's 2014 Residential Energy Use Survey (2014 REUS) and Manitoba Hydro's 2017 Residential Energy Use Survey (2017 REUS). Please see below for the questions asked in the surveys as well as the results.

- A copy of the 2014 REUS is publicly available at the following link:

https://www.hydro.mb.ca/docs/regulatory_affairs/pdf/electric/general_rate_application_2017/information_requests/pub-mh_i-125a-d_attachments.pdf

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- Please see the response PUB/EM I – 8 for a link to the publicly available 2017 REUS.

2014 REUS: Question - Section 6, Question 5 (PDF page 208 of the 2014 REUS)

“What type and approximate percent of the following interior light fixtures are in your residence? (check one for each lighting type)”

	None	20%	40%	60%	80%	100%
Compact Fluorescent						
Halogen						
Incandescent						
LED						
Tube Fluorescent						

2014 REUS Results: Section 6, Question 5 (PDF pages 143-147 of the 2014 REUS)

Lighting Type	None		20%		40%		60%		80%		100%	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Compact Fluorescent	176,672	37.9%	141,063	30.2%	51,162	11.0%	36,196	7.8%	43,827	9.4%	17,478	3.7%
Halogen	333,439	71.5%	90,878	19.5%	20,306	4.4%	11,998	2.6%	6,774	1.5%	3,004	0.6%
Incandescent	152,076	32.6%	79,564	17.1%	56,164	12.0%	56,549	12.1%	95,053	20.4%	26,992	5.8%
LED	351,629	75.4%	60,360	12.9%	21,647	4.6%	15,851	3.4%	13,088	2.8%	3,823	0.8%
Tube Fluorescent	264,930	56.8%	163,826	35.1%	24,212	5.2%	8,920	1.9%	2,831	0.6%	1,680	0.4%

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2017 REUS: Question - Section 6, Question 4 (PDF page 220 of the 2017 REUS)

*“Approximately how many of each type of light bulbs do you have installed at this residence?
(including exterior lights but excluding seasonal or holiday lights – check one for each lighting
type)”*

	None	1-5	6-10	10-20	20-30	30+
Incandescent						
Halogen						
Compact Fluorescent (CFL)						
Light Emitting Diode (LED)						
Tube Fluorescent						

2017 REUS Results: Section 6, Question 4 (PDF pages 98-102 of the 2017 REUS)

Lighting Type	None		1-5		6-10		11-20		21-30		31+	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Incandescent	156,473	32.3%	128,108	26.4%	86,192	17.8%	65,647	13.5%	36,734	7.6%	11,657	2.4%
Halogen	312,772	64.5%	110,292	22.7%	40,265	8.3%	15,899	3.3%	4,051	0.8%	1,532	0.3%
Compact Fluorescent (CFL)	282,370	58.2%	112,370	23.2%	55,612	11.5%	27,960	5.8%	4,681	1.0%	1,817	0.4%
Light Emitting Diode (LED)	134,918	27.8%	94,386	19.5%	76,053	15.7%	134,527	27.7%	27,957	5.8%	16,970	3.5%
Tube fluorescent	225,605	46.5%	198,320	40.9%	38,644	8.0%	17,614	3.6%	3,211	0.7%	1,418	0.3%

REFERENCE:

“Over the long term, failure to make these adjustments could end up significantly distorting Efficiency Manitoba’s savings reporting, as more and more savings become attributed to older codes and standards that may no longer have a meaningful effect.” (Page 125, Section VI, Part C, Item 4)

PREAMBLE TO IR (IF ANY):

Similar to maturing technologies, Codes and Standards evolve over time with increasing Minimum Energy Performance Standards (MEPS). In general, these increasing MEPS are intended to create higher base levels, locking in prior savings going forward and capturing new additional savings going forward. Most Codes and Standards continue to evolve after their original date of enactment, increasing MEPS as technologies mature and become more cost effective.

RATIONALE:

MIPUG wishes to understand the Daymark rationale for adjusting Codes and Standards savings based on the date of enactment.

QUESTION:

- (a) How did Daymark address evolving Codes and Standards in its analysis related to measures where MEPS have increased on multiple occasions since the date of enactment.?
- (b) Does Daymark concur that NOMAD is of lesser relevance in instances where Codes and Standards continue to evolve with progressively higher MEPS, keeping in step with maturing measures that provide higher levels of energy efficiency.?
- (c) Does Daymark have an opinion on the concept of reporting Codes and Standards savings versus claiming Codes and Standards savings given the principle that the development and adoption of Codes and Standards is a collective effort that relies on all levels of government, energy efficiency program administrators, utilities and other entities.?
- (d) Does Daymark concur with the view that Codes and Standards savings will impact energy consumption in Manitoba whether these savings are claimed by Efficiency Manitoba or not.?
- (e) Does Daymark concur that Codes and Standards savings provide marginal benefits to utilities such as Manitoba Hydro whether claimed by Efficiency Manitoba or not.?
- (f) Did Daymark’s analysis of Efficiency Manitoba’s methodology for claiming Codes and Standards savings identify a robust methodology for tracking changes in savings with increases in MEPS.?
- (g) Please explain how “capping” the share of annual savings requirement that can be fulfilled through Codes & Standards savings adequately recognizes the rapid evolution of Codes and Standards related to building codes over the past five years, which will come into affect over the next five years.?

- (h) Does Daymark agree that Codes & Standards implementation supports adoption at higher rates, which may in turn improve the economics and adoption rates of evolving technologies in a manner that would often not occur without adoption implementation of Codes and Standards.?

RESPONSE:

- (a) Our analysis ties back to Table 47 in our report, “Effective dates of respective codes & standards.” The information summarized in this Table is drawn from the responses provided by Efficiency Manitoba in IR PUB-39. Table 47 refers to the effective date reported by Efficiency Manitoba, which in some cases referred to the date of an increase made to an existing standard, which we assumed referred to the most recent change. We did not do independent research to verify this. In the case of the category, “Residential Appliances,” since the reference was to yearly changes, we assumed that these codes were updated at least annually.
- (b) Conceptually, NOMAD can be thought of in terms of two categories of impact: first, some customers may be considered “early adopters” who will tend to adopt the most efficient technologies with or without codes and standards. This portion of the NOMAD effect is relevant, no matter how often codes and standards are updated. There is a second conceptual NOMAD category, however, that is less significant the more often codes and standards are updated. This second category reflects the impact of existing codes and standards, together with ongoing technology development, on what customers expect and what is available in the marketplace—as more efficient technologies become more the norm in the marketplace, they can build a kind of inertia, such that they would continue to be used even if the original code and standard no longer existed.
- (c) In our opinion, given the many actors involved in codes and standards savings, it is challenging to give a precise quantitative answer to the question of the extent to which Efficiency Manitoba should “claim credit” for a particular code or standard. In our report, we accepted Efficiency Manitoba’s analysis of how its efforts (or the efforts of Manitoba Hydro) may have contributed to the enactment of codes and standards.

Adopting a policy of simply “reporting” codes and standards savings would have the advantage of clearly acknowledging the difficulty of assigning credit. However, as has often been pointed out, measurement can be an important management tool. Imperfect though it may be, preserving the requirement that Efficiency Manitoba contribute to the codes and standards for which it is claiming “credit” does provide an ongoing incentive for Efficiency Manitoba to focus on contributing to codes and standards, to track its own efforts, and to report on how its efforts may have contributed to codes and standards adoption.

- (d) Daymark agrees that savings from codes and standards put into place prior to 2019 will impact energy consumption in Manitoba whether these savings are claimed by Efficiency Manitoba or not.

However, allowing Efficiency Manitoba to “claim credit” for codes and standards savings, going forward, does provide Efficiency Manitoba with an incentive to focus on what it can contribute in this area, and might add impetus to efforts to optimize codes and standards.

- (e) We concur that codes and standards savings provide marginal benefit to utilities such as Manitoba Hydro, whether claimed by Efficiency Manitoba or not. However, see our response to MIPUG/DAYMARK-I-20d, above, on how allowing Efficiency Manitoba to “claim” reasonable codes and standards savings may improve the incentive structure for Efficiency Manitoba.
- (f) We did not explicitly address this question in our analysis. However, our position would be that an increase in MEPS should be considered to “refresh” a code and standard for the purpose of considering whether a code and standard should still be considered to be likely effective. If there are codes and standards that have multiple provisions, some of which are adjusted regularly through MEPS and some of which are not, the best tracking would disaggregate updates from non-updated provisions, and track these separately. However, we have not done the analysis to determine if this approach would be practical.
- (g) The point of “capping” the share of the annual savings requirement that can be fulfilled through codes & standards savings is to set up a good set of incentives for Efficiency Manitoba without making reporting requirements too burdensome. “Capping” is not an approach that should be used as a way of evaluating the overall success of codes and standards efforts in Manitoba because, as the question implies, it would not do a good job of recognizing the relative magnitude of impact of any new or revised codes and standards that might be enacted. What it would do is continue to provide Efficiency Manitoba an incentive to promote codes and standards efforts, while setting a cap that ensures that the codes and standards savings do not crowd out the active customer engagement in pushing energy efficiency beyond mandated levels that results from direct energy efficiency programs.
- (h) The question appears to be describing market transformation resulting from codes and standards. We agree that, in the circumstances described, market transformation can occur.

REFERENCE: Daymark Evidence p.126, 128; PUB/EM-39R

PREAMBLE:

In PUB/EM-39R, EM explains that: “Local efficiency staff played a material role in the amendment of the Federal Energy Act. Local efficiency staff assisted the Federal Government by providing technical and market data regarding the heating market in Manitoba and comments to the proposed Amendment during the consultation process. Demand Side Management programs such as the Residential Loan and the High Efficiency Furnace and Boiler Rebate influenced the Manitoba market to the point that 80% of all equipment installed in 2009 was high efficiency products, thus making the Amendment acceptable to the industry and to consumers.”

REQUEST:

Explain why there are no gas savings shown in the chart on page 128 related to Other Residential Equipment, which includes the high efficiency furnace standard

RESPONSE:

Efficiency Manitoba’s workpapers showed codes and standards natural gas projected savings associated with Other Residential Equipment (specifically, high efficiency furnaces) at a projected value of 10,770 cubic meters for 2020-21, with no additional savings in this area projected for the following two years. The three-year total was too small to show up on our chart.

21

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.

22

173 reductions/program investments of the Plan, on a net present value basis. LRI was
 174 selected as it applies the standard DSM rate impact measure test components and is
 175 consistent with the PACT.

5.4 THE LRI ANALYSIS INDICATES MINIMAL ONE-TIME EQUIVALENT ELECTRIC & NATURAL GAS RATE IMPACTS IN THE ORDER OF 0.3% & 1.2%, RESPECTIVELY

176 The results of the LRI indicate that the directional one-time equivalent rate increase
 177 related to the electric DSM portfolio is 0.019¢/kWh with a range of rate increases of
 178 0.19 percent to 0.32 percent assuming various average electric rates for comparison.

	One-Time Equivalent Rate Increase
LRI (¢/kWh)	0.019 ¢/ kWh
LRI Percent Increase (using 6¢/kWh)	0.32%
LRI Percent Increase (using 8¢/kWh)	0.24%
LRI Percent Increase (using 10¢/kWh)	0.19%

179 The results of the LRI indicate that the directional one-time equivalent rate increase
 180 related to the natural gas DSM portfolio is 0.23¢/m³ with a range of rate increases of
 181 1.00 percent to 1.22 percent assuming various average natural gas rates for
 182 comparison.

	One-Time Equivalent Rate Increase
Lifecycle Revenue Impact (¢/m ³)	0.23 ¢/ m ³
LRI Percent Increase (using 19¢/m ³)	1.22%
LRI Percent Increase (using 21¢/m ³)	1.10%
LRI Percent Increase (using 23¢/m ³)	1.00%

5.5 ANNUAL BILL SAVINGS FOR PARTICIPATING CUSTOMERS ARE PROJECTED AT \$15 MILLION FOR ELECTRIC CUSTOMERS & \$3 MILLION FOR NATURAL GAS CUSTOMERS

183 Customers that choose to participate in the electric and natural gas programming
 184 offered by Efficiency Manitoba will realize annual bill reductions based on their energy
 185 savings. For the natural gas portfolio, participating customers will also experience bill
 186 decreases associated with reductions in the federal carbon charge.

187 The annual average bill savings for participating electric customers total \$14.9 million
 188 and the annual average bill savings for participating natural gas customers (including
 189 projected savings related to federal carbon charge reductions) total \$3.0 million.

190 Recognizing that the energy and customer bill savings persist while the energy-
 191 efficient measure is in place, a 30-year NPV of the electric customer bill savings was
 192 determined to be \$434 million while the equivalent natural gas energy and carbon
 193 charge customer bill savings was determined to be \$96 million.

REFERENCE:

Efficiency Plan p.137-141 of 591

PREAMBLE TO IR (IF ANY):

Section 11(g) of the Regulations states that the PUB must consider the impact of the Plan on rates and average customer bill amounts.

QUESTION:

- a) Calculate the residential bill impacts that arise from the gas and electric portfolios in the Plan, maintaining the utility's net income at the same level, as compared to ceasing DSM activities. With assistance and data provided by Manitoba Hydro and Centra, use the customer bill impact schedules (showing consumption at varying levels for the Residential and SGS classes) commonly used by Manitoba Hydro and Centra in their GRA filings. Use currently approved gas and electric rates as a basis. Confirm that these bill impacts reflect the bill impacts for non-participants; that is, these are the bill impacts for those whose consumption is not reduced by participating in DSM programs.
- b) Provide Efficiency Manitoba's best estimate of the dollar impact of each portfolio (electricity and natural gas) on the typical residential participant's annual bills for electricity and gas and for each of the three years in the Plan. For purposes of this calculation, use as the energy savings of the typical residential participant the total energy saving of the portfolio divided by the number of customers that participate in at least one program and exclude the rate increases calculated in (c) of this IR. State any additional assumptions that are needed to complete this calculation.
- c) The LRI for the gas portfolio assumes receiving the funds for the Furnace Replacement Program from Centra according to section 15(2)(b) of the Regulations. What amount of funds did Efficiency Manitoba expect to receive from Centra when calculating the gas LRI? If the expected FRP funds are materially different than the funds that will be transferred to Efficiency Manitoba as a result of Board Order 152/19 Directive 10, recalculate the gas portfolio LRI and one-time rate increases in Table 5.7, as well as the response to (a) of this IR.

- d) Confirm whether EM reviewed or is aware of the rate and bill impact analysis that is filed by EfficiencyOne (Nova Scotia) with its regulator. If confirmed, comment on the feasibility of adopting a similar analysis for Efficiency Manitoba.

RATIONALE FOR QUESTION:
RESPONSE:

- a) Efficiency Manitoba has been advised by Manitoba Hydro that the information required to provide a response to this information request is not currently available. Any response to calculate the actual rate impacts as is being requested would require an updated resource plan and integrated financial forecast (IFF) from Manitoba Hydro to identify the revenue and cost implications associated with Efficiency Manitoba's plan. As a result of the strategic planning and independent review process that Efficiency Manitoba is advised is currently ongoing at Manitoba Hydro, Manitoba Hydro does not currently have an IFF or rate strategy in place. Manitoba Hydro advised Efficiency Manitoba that it will not have a current IFF or rate strategy in place until the processes currently ongoing at Manitoba Hydro are complete. Any response prepared without all these inputs would require a number of assumptions to be made which would render any output unreliable to such an extent that no accurate conclusions could be drawn or substantiated from the output.

Efficiency Manitoba has been advised by Manitoba Hydro that any near term rate and bill impacts of Efficiency Manitoba's three year plan are not anticipated to be material when compared to the rate impacts resulting from the recent significant investments projects such as Bipole III, Keeyask and MMTP and the rate impacts of those projects coming into service.

- b) Please see Table 5.8 and Table 5.9 of the 2020/23 Efficiency Plan, p. 142 and 144 of 591.
- c) Please see the response to PUB/EM I-10 d) for the funds that are expected to be transferred to Efficiency Manitoba on April 1, 2020. Please see the 2020/23 Efficiency Plan, p. 140 of 591, lines 215-217 for the FRP amounts removed when calculating the natural gas LRI.

- d) Efficiency Manitoba is aware of the rate and bill impact analysis that is filed by EfficiencyOne (Nova Scotia). Efficiency Manitoba has not reviewed that approach in detail and is unable to comment on the feasibility of adopting a similar analysis for Efficiency Manitoba.

REFERENCE: Daymark Evidence p.74; Coalition/EM I-22

PREAMBLE:

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REQUEST:

- a) Refile Table 17 removing load displacement projects.
- b) If Daymark extracted the measure lives from EM’s workpapers in the process of creating Tables 17 and 18, provide a table showing the lives of each measure as was requested in Coalition/EM I-22.

RESPONSE:

- a) Table 17 has been found to be incorrectly allocated. While totals remain the same, allocation among measure-life buckets needs correction. The original table in the Daymark report is shown below with ~~strikeout~~.

Year Range	Total Three-Year Savings (kWh)	Savings as % of Total	Cumulative Savings %
1-5	371,112,450	42%	42%
6-10	27,286,730	3%	45%
11-15	345,589,248	39%	84%
16-20	76,082,351	9%	93%
21-25	42,615,692	5%	98%
26-30	12,264,138	1%	99%
31+	5,767,240	1%	100%
Total	880,717,849		

The following table is the corrected version of Table 17 which is included in the revised Report:

Year Range	Total Three-Year Savings (kWh)	Savings as % of Total	Cumulative Savings %
1-5	348,505,184	40%	40%
6-10	65,873,774	7%	47%
11-15	400,879,233	46%	93%
16-20	21,957,879	2%	95%
21-25	24,329,811	3%	98%
26-30	13,404,729	2%	99%
31+	5,767,240	1%	100%
Total	880,717,849		

The following table is the requested version of Table 17 (see EM/DAYMARK I-1) with all Load Displacement Program projects removed, which relies on the corrected Table above:

Year Range	Total Three-Year Savings (kWh)	Savings as % of Total	Cumulative Savings %
1-5	51,505,184	9%	9%
6-10	65,873,774	12%	21%
11-15	367,912,233	67%	88%
16-20	21,957,879	4%	92%
21-25	24,329,811	4%	97%
26-30	13,404,729	2%	99%
31+	5,767,240	1%	91%
Total	550,750,849		

b) Below is the table summarizing the average measure-life of each bundle, having been weighted by kWh or cubic meter savings as appropriate.

The weighted average measure life was estimated by using the following mathematical formula for each bundle in electric and natural gas portfolios:

$$\text{Weighted average measure life} = \frac{\sum_i^N (\text{measure life})_i * (\text{Savings})_i}{\sum_i^N (\text{Savings})_i}$$

where *i* is the measure and N is the total number of measures considered in each bundle of electric and natural gas portfolios separately.

	Electric	Weighted Measure Life (Years)	Natural Gas	Weighted Measure Life (Years)
Agricultural	Emerging Technology	20		
	Custom	25	Custom	25
	Emerging Technology	22	Emerging Technology	20
Commercial	HVAC & Controls	19	HVAC & Controls	21
	In Suite Efficiency	6	In Suite Efficiency	12
	New Construction & HPB	6	New Construction & HPB	11
	Renovation	12	Renovation	25
	Small Business & Appliance	9	Small Business & Appliance	9
Income Qualified	Income Qualified	41	Income Qualified	28
Indigenous	Community Geothermal	20		
	Insulation and Direct Install	26	Metis Income Qualified	24
	Metis Income Qualified	24		
	Small Business	10		
Industrial	Custom	14	Custom	19
	Load Displacement	2		
Residential	Direct Install	8	Direct Install	9
	Emerging Technology	25	Home EE Kits & Education	9
	Home EE Kits & Education	9	Home Renovation	27
	Home Renovation	21	New Homes & MR	34
	New Homes & MR	37	Product Rebates	9
	Product Rebates	9		

Tables showing individual measures and associated measure lives for the electric and natural gas portfolios are included in PUB/Daymark I-7b CSI Attachment filed with this response.

3. Daymark review

The Daymark review found the formulas and modeling in this analysis to be proper and accurate. There is one concern; the equivalent one-time rate increase is based upon spreading the effects of the respective portfolios over 30-years. This spreads the effects of short-lived measures over 30-years, even if the measure life is only 5-years. Any rate effects from an energy efficiency measure would occur only over the measure life. The 30-year equivalent one-time rate increase would be a reasonable approximation if most of the energy savings came from long-lived, 20-year or more measures.

As discussed in an earlier section but repeated here for convenience, the tables below were produced from the detailed worksheets provided by Efficiency Manitoba and shows measure savings grouped by different five-year measure life strata. The chart not only shows the total savings associated with each group of measures but provides the cumulative impacts of the measures from the shortest-lived to the longest-lived. For example, the first measure life group (measures with a lifespan of 1-5 years), the measures expected in the plan total 42% of projected three-year electric portfolio savings. For the second group of measures (measures with a lifespan of 6-10 years) the percent of total savings is 3%, and for the third group (11-15 years), the percent of total savings is 39%. The cumulative column shows that these three groups total 84% -- that is, it shows that 84% of the electric savings project in the Plan come from measures with expected lives of 15 years or less.

In the natural gas measures table, the same format is used. The table shows that only 22% of the projected natural gas savings comes from measures with lives of 15 years or less.

Year Range	Total Three-Year Savings (kWh)	Savings as % of Total	Cumulative Savings %
1-5	371,112,450	42%	42%
6-10	27,286,730	3%	45%
11-15	345,589,248	39%	84%
16-20	76,082,351	9%	93%
21-25	42,615,692	5%	98%
26-30	12,264,138	1%	99%
31+	5,767,240	1%	100%
Total	880,717,849		

Table 40: Savings by measure-life group – electric

Year Range	Total Three-Year Savings (m3)*	Savings as % of Total	Cumulative Savings %
1-5	1,112,134	4%	4%
6-10	1,070,171	3%	7%
11-15	4,785,178	15%	22%
16-20	7,843,158	25%	47%
21-25	13,344,427	43%	90%
26-30	2,864,947	9%	99%
31+	162,666	1%	100%
Total	31,182,679		

*Does not include program-level interactive effects.

Table 41: Savings by measure-life group – natural gas

4. Daymark LRI analysis

To determine whether the Plan’s LRI analysis based on a 30-year levelization period presents the best indicator of how the one-time equivalent rates should be calculated, Daymark performed additional LRI tests to analyze the rate impact using levelization periods associated with the different measure lives. Daymark’s analysis used the same present value costs, benefits and loss revenue metrics as provided in the Plan and its associated work papers.

a) Methodology

To determine the LRI⁸⁵ by measure life, Daymark conducted the same analysis as Efficiency Manitoba for each of the 5-year groups of measures. The difference is that the rate increases were only spread over the period equal to the highest measure life of the groups. The measures in the group with 1-5 year life produce an estimated average annual LRI for years 1 through 5. This is one piece of the rate impact for those years. All the measure groups will impact rates in years 1 through 5. The measures in the group with 5-10 year life produce an estimated average annual LRI for years 1 through 10 with similar analysis for each group. By looking at the impact of all the groups of measures, we found a much higher average rate impact in the first five years, then decreasing impacts in the subsequent 5-year periods.

- The LRI for the first five years results from all measure life groups combined, since all measures are active in the first five years.⁸⁶
- The LRI for the second five years results from combining all measure life groups with lives greater than 5-years, i.e., excluding the first five years measure group.⁸⁷

While over the 30-year period Efficiency Manitoba used, the impact, on a present value basis, is the same, this methodology more closely estimates the potential impact on rates in the early years. The results for the first two 5-year periods for electric and natural gas portfolios are shown in Table 42 and Table 43 respectively.

b) Electric portfolio

The table below compares the Efficiency Manitoba LRI equivalent one-time rate increase to the Daymark estimated rate impact in the first 10-years.

⁸⁵ LRI = RIM Benefits - RIM Costs – Revenue Loss

⁸⁶ Years 1-5, 6-10, 11-15, 16-20, 21-25, and 26-30.

⁸⁷ Years 6-10, 11-15, 16-20, 21-25, and 26-30.

	Efficiency Manitoba One-Time	Measure life adjusted rate increase	
		Equivalent Rate 30-year Increase	Average 1 st 5-Years
LRI (¢/kWh)	0.019	0.059	0.031
LRI Percent Increase (using 6¢/kWh)	0.32%	0.99%	0.52%
LRI Percent Increase (using 8¢/kWh)	0.24%	0.74%	0.39%
LRI Percent Increase (using 10¢/kWh)	0.19%	0.59%	0.31%

Table 42: Electric portfolio – rate impact by measure life

The Efficiency Manitoba LRI equivalent one-time rate increase of 0.019 ¢/kWh compares to our estimated average impact of 0.059 ¢/ kWh (0.99%) for years 1 through 5, followed by a lower an average impact of 0.031 ¢/kWh (.52%) for the years 6 through ten. There are two important observations in this comparison:

- The first five years of the electric portfolio could have a rate impact three times (3x) as large as the 30-year LRI shown in the Plan
- Both methods show a relatively small impact on rates resulting from the proposed three-year Plan

c) Natural gas portfolio

The table below compares the equivalent 30-year one-time rate increase to the rate increase that accounts for measure life, showing the Daymark estimated rate impact in the first 10-years for natural gas rates.

	One-Time Equivalent Rate Increase	Measure Life Adjusted Rate Increase	
		Average 1 st 5 Years	Average 2 nd 5 Years
Lifecycle Revenue Impact (¢/m ³)	0.23	0.41	0.24
LRI Percent Increase (using 19¢/ m ³)	1.22%	2.17%	1.25%
LRI Percent Increase (using 21¢/ m ³)	1.10%	1.97%	1.13%
LRI Percent Increase (using 23¢/ m ³)	1.00%	1.79%	1.03%

Table 43: Natural gas portfolio – rate impact by measure life⁸⁸

The Efficiency Manitoba LRI equivalent one-time rate increase of 0.23 ¢/ m³ (1.22%) compares to our estimated average impact of 0.41 ¢/ m³ (2.17%) for years 1 through 5, followed by the impact being the same as the 30-year LRI, with an average of 0.24 ¢/ m³ (1.25%) for the years 6 through 10.

There are two important observation in this comparison:

- The impact of capturing measure life in the estimate of LRI for the natural gas portfolio is less than the electric portfolio, due to the higher percentage of savings in the natural gas portfolio attributed to measures with longer lives
- The rate impact of the first five years of the natural gas portfolio could be two times (2x) as large as the 30-year LRI shown in the Plan
- For the natural gas portfolio, both methods show a relatively small impact on rates resulting from the proposed three-year Plan

V. PLAN FOR EVALUATION, MEASUREMENT & VERIFICATION (TRACKING)

Efficiency Manitoba is planning multiple approaches to monitor, track, and evaluate its proposed Three-year Plan. Specifically, Efficiency Manitoba is planning to monitor energy savings and budget at the measure-level with the help of the Customer Relationship Management/Demand-Side Management (CRM/DSM) System. In order to self-evaluate its program and corporate performances, Efficiency Manitoba is proposing to implement a scorecard methodology to evaluate its performances and benchmark it's outcome with other jurisdictions' energy efficiency programs. Moreover, Efficiency Manitoba

⁸⁸ Levelized over a 30-year period.

REFERENCE: Page # 73-73 (pdf page 79-80)

PREAMBLE:

-

QUESTION:

For each of the natural gas and electric portfolios, please provide the weighted average measure life – using savings as the weighting factor.

RATIONALE:

To better understand the period over which the benefits from the Plan will accrue.

RESPONSE:

Please see the table below with the estimated weighted measure life (in years) for both electric and natural gas portfolios.

Portfolio	Weighted average measure life (years)
Electric	8.8
Natural Gas	19.5

The weighted average measure life was estimated using following mathematical formula for each portfolio:

$$\text{Weighted average measure life} = \frac{\sum_i^N (\text{measure life})_i * (\text{Savings})_i}{\sum_i^N (\text{Savings})_i}$$

where i is measure and N is the total number of measures in each electric and natural gas portfolio.

REFERENCE: Page # 106-107 (pdf pages 112-113)

PREAMBLE:

The Report provides LRI results calculated over 5 and 10 year time frames as opposed to the 30 years used by Efficiency Manitoba.

Coalition/EM I-33 f) & g) also provides LRI results calculated over 5 and 10 year time frames.

QUESTION:

- a) Please further clarify what the values set out in Tables 42 and 43 of the Daymark Report represent. For example, i) does the “5-year” column represent the LRI results of discounting the first five years of benefits and cost for all measures and ii) does the “10-year” column provided represent the LRI result from discounting the first 10 years of benefits for all measures with a life longer than 5 years?
- b) Can Daymark provide any insight as to why its 5-year results differ from those provided in response to Coalition/EM I-33 g)?
- c) Please provide Daymark’s calculation of the LRI results from discounting the first 10 years of benefits and cost for all measures.
- d) If the results provided in response to part (c) differs from those provided in response to Coalition/EM I-33 f), can Daymark provide any insight into why?

RATIONALE:

To better understand the LRI sensitivity analysis performed by Daymark.

RESPONSE:

In order to facilitate the understanding of the response, Tables 42 and 43 are provided below.

	Efficiency Manitoba One-Time Equivalent Rate 30-year Increase	Measure life adjusted rate increase	
		Average 1 st 5-Years	Average 2 nd 5 Years
LRI (¢/kWh)	0.019	0.059	0.031
LRI Percent Increase (using 6¢/kWh)	0.32%	0.99%	0.52%
LRI Percent Increase (using 8¢/kWh)	0.24%	0.74%	0.39%
LRI Percent Increase (using 10¢/kWh)	0.19%	0.59%	0.31%

Table 1: Electric portfolio – rate impact by measure life

	One-Time Equivalent Rate Increase	Measure Life Adjusted Rate Increase	
		Average 1 st 5 Years	Average 2 nd 5 Years
Lifecycle Revenue Impact (¢/m ³)	0.23	0.41	0.24
LRI Percent Increase (using 19¢/ m ³)	1.22%	2.17%	1.25%
LRI Percent Increase (using 21¢/ m ³)	1.10%	1.97%	1.13%
LRI Percent Increase (using 23¢/ m ³)	1.00%	1.79%	1.03%

Table 43: Natural Gas portfolio – rate impact by measure life¹

- a) Daymark’s estimates come from breaking up the LRI into five pieces, corresponding with 5-year (and in one case, 10-year) groupings of measure lives,² with each LRI leveling rate impacts over the number of years corresponding to the group measure life, and adding all of the results together to get the LRI for the first five years. That is, the rate impact of measures lasting five years or lower was leveled over five years; the rate impact of measures lasting from 6-10 years was leveled over ten years; and so on. Since, using this methodology, the rate impact for the measures with lifespans of five years and lower was fully reflected in a leveled five-year calculation, Daymark then eliminated the LRI from this group of measures with 1-5-year measure lives to get the estimated rate impact in the 2nd five years. The rate impact accordingly begins at the highest level, reflecting the leveled costs for all measure groups, and steps down as the leveled cost of each group of measures is fully covered.
- b) The response to COALITION/EM 1-33g utilizes cash flows from distinct five-year and ten-year annual periods of benefits and costs, present valued, as the primary input into the LRI impacts. The calculation for five years levelizes all program costs over five years, producing a rate impact number that would cover all program costs within five years. The Daymark methodology, in contrast, estimates the LRI for all of the measure groups over their average lives, utilizing all of the years that the measures are in service. The Daymark calculation thus spreads the rate impacts over the measures’ lives. The resulting five-year rate impact reported in Tables 42 and

¹ Levelized over a 30-year period.

² 0-5 years; 5-10 years; 10-15 years; 15-20 years; and 20-30 years.

43 therefore is set to fully fund all measures five years or less within five years, but does not fully fund (within five years) measures with longer lives.

This means that there are two basic effects that likely account for Daymark having lower LRI figures: first, more years of savings in dollars accounted for, since Daymark incorporates savings over a longer period than five years, when justified by measure life; and, second, longer periods over which to levelize the LRI. Daymark suggests that our methodology better represents likely annual rate impacts, especially when energy efficiency costs are amortized for ratemaking periods over ten years and not expensed in a single year, as the EM methodology would imply.

- c) As found on page 101 (pdf page 107) of the Daymark report, the LRI calculation by EM is shown below:

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

where:

- program costs and incentives are defined consistently within the Program Administration Cost Test (PACT);
- marginal benefits are defined consistently with the PACT (levelized benefits of the marginal values);
- revenue loss includes the decrease in revenue realized by Manitoba Hydro resulting from lower electricity or natural gas sales as a result of customers' energy savings. The revenue losses were calculated by applying the current Manitoba Hydro Rate structure³ with assumed escalation to the reduced sales resulting from the efficiency programs over the 30-year period; and
- system energy is the Base Electric Load Forecast or Actual Natural Gas extended throughout the 30-year period

The Daymark calculations modified this formula in two ways to estimate the LRI of each 5-year group.

- First, the numerator PVs in the formula are just for measures in the specific measure-life group

³ Public Utilities Board (PUB) approved rates from June 1, 2019 and November 2018 and adjusted for inflation were used for electric and natural gas respectively.

- Second, in order to capture the average in a five-year period, the denominator used for the PV of System Energy is for the years up to the midpoint of the measure life grouping

This calculation by Daymark provides an estimate of the average impact of each group over the years up to the end of life of the groups. For the average 1st 5-years value we sum up the LRI of all the groups' individual LRI values. The average of the 2nd 5-years value come from summing up the LRI of all group values, eliminating the first group of 1-5-year measure lives. The result is a picture of a potential rate impact, reflecting a hypothetical rate increase that would step down over time as the NPV impact of each five-year group of measures is fully covered during their measure-life window.

- d) See the response to part b) above.

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 3³⁴, 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 GWh³⁵ 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 value³⁶. 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

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

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

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)				
		<i>For the year ended March 31</i>				
		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	

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.

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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)				
		<i>For the year ended March 31</i>				
		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	

PUB/MH I-97

Subject: Tab 9: Demand Side Management

Reference: DSM Accounting Treatment Comparison

- b) Please provide a continuity schedule showing spending, amortization expense, amortization rates and balances for planning studies and demand side management for the years 2004/05 through 2011/12.

ANSWER:

Please see the following planning studies and DSM continuity schedules.

Planning Studies Continuity Schedule

(\$000's)

	2005 Actual	2006 Actual	2007 Actual	2008 Actual	2009 Actual	2010 Forecast	2011 Forecast	2012 Forecast
Opening Balance	37 101	45 458	63 099	28 476	25 265	25 171	-	-
Additions	12 977	23 153	9 491	3 682	2 605	-	-	-
Amortization Expense	(4 621)	(5 485)	(2 437)	(2 366)	(2 539)	-	-	-
Transfers	-	(27)	(41 676)	(4 527)	(160)	-	-	-
Transfer to Retained Earnings						(25 171)		
Ending Balance	<u>\$ 45 458</u>	<u>\$ 63 099</u>	<u>\$ 28 476</u>	<u>\$ 25 265</u>	<u>\$ 25 171</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

Demand Side Management Continuity Schedule

(\$000's)

	2005 Actual	2006 Actual	2007 Actual	2008 Actual	2009 Actual	2010 Forecast	2011 Forecast	2012 Forecast
Opening Balance	61 187	76 383	95 917	122 948	148 700	163 776	182 162	200 321
Additions	21 153	28 153	36 128	37 109	35 178	40 329	42 989	42 544
Amortization Expense	(5 957)	(7 247)	(9 098)	(11 357)	(20 102)	(21 943)	(24 829)	(28 703)
Transfers	-	(1 373)	-	-	-	-	-	-
Ending Balance	<u>\$ 76 383</u>	<u>\$ 95 917</u>	<u>\$ 122 948</u>	<u>\$ 148 700</u>	<u>\$ 163 776</u>	<u>\$ 182 162</u>	<u>\$ 200 321</u>	<u>\$ 214 162</u>

EM/MIPUG I-2

Reference:

Evidence of Bowman, Section 4.1, Estimated Short-Term Rate Impacts, PDF page 23 and 24.

Preamble:

On PDF pages 23 and 24, Mr. Bowman provides a discussion of Manitoba Hydro's cost of service treatment of DSM costs with his estimate of the reduced revenues through energy conservation and the incremental extra-provincial revenues available to Manitoba Hydro through that level of reduced domestic energy consumption.

On page 24 he states:

"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% plus 1% debt guarantee fee, for a total of 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."

Mr. Bowman then provides his estimate of reduced revenues to Manitoba Hydro from the effects of energy conservation and estimates the approximate increase in extra-provincial revenues afforded to Manitoba Hydro through the resulting increase in surplus energy available for export. He concludes by stating:

"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."

Question:

- a) Would Mr. Bowman agree that Efficiency Manitoba's investment in DSM programming would be treated by Manitoba Hydro in the same manner as Manitoba Hydro's current investment in its own DSM programming, as described in the preamble? If not, why not?
- b) If Manitoba Hydro, and not Efficiency Manitoba, were to undertake DSM programming such that a \$50 million annual investment is made, please confirm that Manitoba Hydro would need to fund that \$50 million through borrowing and incur the same level of estimated finance expense? If not, why not?

- c) If Manitoba Hydro and not Efficiency Manitoba were investing in programs that provided the same level and pattern of energy savings, that the revenue reductions would be the same, estimated by Mr. Bowman to be approximately \$40 million by the end of year 3? If not, why not?
- d) If Manitoba Hydro and not Efficiency Manitoba were to undertake DSM programming that resulted in the availability of 979 GWh of additional energy for export as per his analysis, that the resulting estimate of export revenues would also be \$43 million as estimated by Mr. Bowman? If not, why not?
- e) If Manitoba Hydro or Efficiency Manitoba undertook DSM programming with an equivalent level of investment, finance expense, energy reductions and incremental extra provincial revenues as in Mr. Bowman's example, would his analysis result in the same impact on MH's cost of service of \$37 million? If not, why not?
- f) Given that Manitoba Hydro's Integrated Financial Forecast already includes a forecast of DSM investment and considers the related domestic energy reductions, extra-provincial revenue implications and the impact on debt and finance expense associated with that current investment, is it not more appropriate to analyse the incremental difference in DSM investment, lost domestic revenues and incremental extra-provincial revenues between the Efficiency Manitoba plan and Manitoba Hydro's current forecast? If not, why not?

Response:

(a)

In principle, the payment of Efficiency Manitoba's costs by Manitoba Hydro provides the same economic benefit as when these programs were ran by Manitoba Hydro, and as a result should be treated in the same manner (e.g. amortized over a lengthy period commensurate with the benefits). However, It is not clear that accounting rules will automatically permit this, given Hydro is likely simply paying one annual amount. If so, it is expected that the PUB will need to provide direction or clarification on these matters at an appropriate time.

(b)

Confirmed.

(c)

Confirmed. The estimate was provided by Efficiency Manitoba, not Mr. Bowman.

(d)

Confirmed. The 979 GWh is per Efficiency Manitoba figures and not Mr. Bowman's analysis. Mr. Bowman provided the calculation of the \$43 million, but this is just a placeholder that cannot be confirmed without access to confidential Manitoba Hydro data.

(e)

Yes. All values would be effectively the same. There may be a difference in timing, or in recognition of some deferred amounts (such as pensions for employees if within Manitoba Hydro, versus cash payments to EM for the same general categories of expenses) but the difference would be minimal.

(f)

Manitoba Hydro's Integrated Financial Forecast includes an estimate of future DSM, but the PUB has never been in a position to sign off or endorse programming, much less programming over a 3 year period that goes beyond any then-current rate review. For this reason, the new framework encourages, if not requires, consideration of the impacts of EM's programming in a way that was not present when Manitoba Hydro ran the equivalent programming.

PUB Advisor Summary - Bowman Rate Impact Analysis - Evidence p.23-26

	Year 1	Year 2	Year 3	
	2020/21	2021/22	2022/23	
1 (\$000,000)				
2 Electric Portfolio Costs - Annual	50	50	50	
3 Electric Portfolio Costs - Cumulative	50	100	150	
4 EM DSM Amortization	5	10	15	
5 EM DSM Amortization - Cumulative	5	15	30	
6 EM DSM Deferred Balance	45	85	120	
7 Financing of DSM Deferrals	2	3	5	
8 Bowman Net Revenue Requirement Impact	7	13	20	A
9 Reduced Revenue	20	40	60	B
10 Benefit - Increased Export Revenues			43	C
11 Bowman Combined Annual Impact		A+B-C=	37	
12 Bowman Unit Annual Impact (c/kWh, Note 1)			0.148	
13 Note 1: \$37M / 25,000GWh = 0.148c/kWh, not 0.17				
14 GSL 30-100kV Bill Impact			2.7%	
15 Residential Bill Impact (1000kWh/month)			1.54%	
16 <u>Alternate Adjustments (PUB Advisor)</u>				
17 MH DSM Amortization Ceasing After 10 Years (Note 2)	4	8	13	
18 Alternate Net Revenue Requirement Impact	3	5	7	D
19 Note 2: 2010/11 Electric GRA PUB/MH I-97b				
20 Alternate Combined Annual Impact		D+B-C=	24	
21 <u>Alternate Bill Impacts</u>				
22 Annual Load (GWh per PUB/EM-45)			26000	
23 Unit Impact cents per kWh			0.092	
24 Residential Rate Impact (\$8.62 basic charge and 8.74c/kWh)			1.06%	
25 GSL 30-100kV Bill Impact (30-100kV, 50,000kVA, 60% LF)			1.71%	

January 1, 2020

REFERENCE:

PUB/MH I-131c; Coalition/MH I-132i

PREAMBLE TO IR (IF ANY):**QUESTION:**

Please provide the updated Generation and combined marginal values when they have been updated. Please identify which Energy Price Forecast underpins the updated marginal values and whether the changes to the export revenue forecast (elimination of the value of surplus uncontracted firm capacity and dependable energy premium) have been included.

RATIONALE FOR QUESTION:**RESPONSE:**

The updated marginal values using the 2017 Resource Planning assumptions are provided in the table below. The calculations are based on the 2017 Load Forecast and the 2017 Energy Price Forecast for the marginal value of energy on the export market. Surplus energy is valued as an opportunity product with no premium.

The 2017 update includes a change in the methodology for the valuation of the generation capacity marginal value. Due to the uncertainty in the value of generation capacity in the export market, Manitoba Hydro has concluded that it is more appropriate at this time to base the value of generation capacity on the deferral of a new generation resource in Manitoba. The generation capacity marginal value is based on deferral of a peaking type natural gas combustion turbine built in 2030/31. Manitoba Hydro's current base development sequence includes significant projected DSM savings and indicates a need date for new resources in the 2039/40 timeframe. The 2030/31 timeframe corresponds with a need date for new resources in Manitoba when projected savings from new DSM beyond 2017 are removed from the base planning sequence.

30 Year Levelized Marginal Values
 [cents/kWh]

Components	Used in 2016 DSM Plan		2017/18 Marginal Value in 2017 \$	Change From 2015/16 to 2017/18
	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%

The 2017/18 levelized Marginal Value is approximately 28% lower than the 2015/16 Marginal Value. The majority of the decline in marginal value of the generation component is a result of approximately 30% lower energy value in 2017 price forecast, with a change in methodology contributing to the remainder.

23

REFERENCE:

Efficiency Plan p.234 of 591

PREAMBLE TO IR (IF ANY):

Section 11(g) of the Regulations states that the PUB must consider the impact of the Plan on rates and average customer bill amounts.

QUESTION:

- a) Confirm that, all else being equal, the lifecycle revenue impact (LRI) 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 in the year, utility revenue decreases, and the utility benefits.
- b) Confirm whether, all else being equal, the Lifecycle Revenue Impacts given in Tables 5.6 and 5.7 are the rate increases that if introduced in the first year and maintained for 30 years, would generate revenue in NPV terms that exactly offsets the financial impacts of the recovery of EM costs from the utility, utility revenue decreases, and the utility benefit. Is it correct to view the LRI metric as the levelized impact over 30 years of EM's Plan on customer rates and bills, on average? If not, please explain.
- c) Please confirm that the LRI impacts show the total impact of the three years of the Plan. Please provide the individual LRI metrics for each year of the three-year Plan.
- d) Confirm whether an additional Lifecycle Revenue Impact - that is, a one-time equivalent rate increase - will be required for Efficiency Manitoba's next three-year Efficiency Plan for 2023-25, assuming similar levels of expenses and savings.

RATIONALE FOR QUESTION:**RESPONSE:**

- a) Confirmed.

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- b) Confirmed. The Lifecycle Revenue Impacts (“LRI”) given in the 2020/23 Efficiency Plan (“Plan”) Table 5.6 for electricity (Plan, Section 5.4.1, p. 139 of 591) and Table 5.7 for natural gas (Plan, Section 5.4.2, p. 141 of 591) represent a one-time (at the beginning of first year) equivalent increase in rates that will re-equate: the present value of the utility revenues; utility marginal benefits associated with the energy savings; and the program costs associated with the Plan electric and natural gas portfolios, respectively within the Plan over the 30 year period considered. Determination of this metric means that this one-time increase in rates does not require annual incremental increases or decreases to balance the net present value of costs and benefits associated with the Plan. To illustrate, using the LRI of the electric portfolio from Table 5.7, requires a 0.019 ¢/kWh (\$0.00019/kWh) electric rate increase in year 1 of the Plan. Assuming no additional increases or decreases to this initial rate increase over a 30-year period will provide the required net present value balance to the costs and benefits associated with the electric portfolio provided in the Plan.
- c) Confirmed. The LRI calculation considers the present value of the cost and benefit impacts from the Plan electric and natural gas portfolios and are completed on a 30-year NPV basis. Annual LRI metrics are not available.
- d) Confirmed.

- *Furnace Replacement Program (FRP) and Affordable Energy Fund (AEF)*

Efficiency Manitoba excludes the costs associated with the FRP from the LRI analysis as these costs have already been collected from customers and will not impact future rates¹³⁰. This treatment is reasonable and a similar treatment should be applied to the AEF if it is used in the future to support Efficiency Manitoba's program initiatives.

4.3 CUSTOMER BILL IMPACTS

In order to address Section 11 g) of the Regulation Efficiency Manitoba also completed an annual average customer bill impact for each program bundle and for the natural gas and electricity portfolios overall¹³¹. The Application also provides 30-year net present values for the electric and natural gas customer bill savings.

Comments

While the average annual bill impact calculations address the requirements of the Regulation they are of limited use in any assessment of the Plan. The reason for this is that they give an incomplete and misrepresentative picture of the implications for participating customers. **Many of Efficiency Manitoba's programs require an upfront investment/expenditure by the participating customers¹³². Furthermore, while Efficiency Manitoba proposes to offer financial incentives to customers participating in some of its programs, in many cases these incentives do not cover the full costs that participants will incur¹³³.**

The 30-year present values for the anticipated savings are also misleading. Not only do they exclude the net costs that participating customers will incur but the analysis appears to have used Manitoba Hydro's discount rate. It is important to establish the perspective that a present value analysis is meant to represent. In this case it would be the customer's perspective and the discount rate used should be one that reflects the customer's time value of money¹³⁴.

¹³⁰ Daymark/EM I-29; PUB/EM I-22 c) and Coalition/EM I-22 a)

¹³¹ Section 5, pages 17-19

¹³² Coalition/EM I-36 a)

¹³³ Daymark/EM I-13 – Attachment 1

¹³⁴ This is discussed in section 4.1 of the Evidence

In its deliberations as to whether or to approve the Plan the PUB should not attach significant weight or consideration to the results of the bill impact calculations as presented.

5.0 EFFICIENCY MANITOBA'S ALLOCATION OF SUPPORT COSTS AND CORPORATE OVERHEADS

The following table sets out the average annual electric and natural gas portfolio budgets and indicates how the various types of costs are attributed between the two.

Table #8		EFFICIENCY MANITOBA 2020/21-2022/23 AVERAGE ANNUAL BUDGET ('000's \$)			
		ELECTRIC PORTFOLIO	NATURAL GAS PORTFOLIO	TOTAL	ATTRIBUTION
PROGRAM COSTS					
	INCENTIVES	\$31,158	\$14,089	\$45,247	DIRECTLY ASSIGNED (COALITION/EM I-40)
	PROGRAM DESIGN	\$4,491	\$1,940	\$6,431	DIRECTLY ASSIGNED (COALITION/EM I-42)
	MODELLING, ADMIN &SUPPORT				
	ADVERTISING	\$1,151	\$710	\$1,861	DIRECTLY ASSIGNED (COALITION/EM I-43)
	DELIVERY	\$3,643	\$1,521	\$5,164	DIRECTLY ASSIGNED (COALITION/EM I-41)
	SUBTOTAL	\$40,443	\$18,260	\$58,703	
ENABLING STRATEGIES					
	PROGRAM SUPPORT & EDUCATION	\$1,319	\$350	\$1,669	MOSTLY ALLOCATED (COALITION/EM I-44)
	INNOVATION, CODES & STANDARDS AND EVALUATION	\$4,940	\$1,647	\$6,587	ALLOCATED (COALITION/EM I-44)
	SUBTOTAL	\$6,259	\$1,997	\$8,256	
	CORPORATE OVERHEADS	\$2,191	\$730	\$2,921	ALLOCATED (COALITION/EM I-46)
	TOTAL	\$48,893	\$20,987	\$69,880	
	Source: Coalition/EM I-39				

As indicated in the table Efficiency Manitoba is able to directly attribute the program related costs with either the electric or natural gas portfolio. In the case of Enabling Strategies there are certain Program Support and Education activities that are predominantly electric focused and are assigned to the electric portfolio. These include¹³⁵:

- First Nations support activities as nearly all First Nations communities do not have access to natural gas.

¹³⁵ Coalition/EM I-44 i)

REFERENCE:

PDF 315, lines 44-45 and PDF 317, Table A5.1 Appendix A Section A5.1. and Section A5.2

PREAMBLE TO IR (IF ANY):

Efficiency Manitoba states that "there are approximately 159,000 homes in Manitoba that fall below the LICO 125 threshold." In Table A5.1 Efficiency Manitoba projects that the Income Qualified program will reach 3,420 electric houses/suites in 2020/21, 3,160 in 2021/22, and 3,180 in 2022/23, and 3,600 natural gas houses/suites in 2020/21, 2,500 in 2021/22, and 2,400 in 2022/23.

QUESTION:

Please explain how the proposed participation numbers were determined, including a discussion of the range of participation that was considered before the proposed participation was reached.

RATIONALE FOR QUESTION:

Understanding Efficiency Manitoba's assumptions in detail is necessary to assess the reasonableness of their program selections and projections.

RESPONSE:

Table A5.1 Income Qualified Energy & Greenhouse Gas Emissions Savings Summary (2020/23 Efficiency Plan, Section A5.2, p.317 of 591) should be revised as per the table below. This table has been enhanced to provide more detail regarding the number of homes (i.e. houses or suites) participating in Income Qualified Offers, and the total number of retrofits taking place as part of Income Qualified Offers.

Please see the response to DAYMARK/EM I – 13d for a description of how participation estimates were determined. Efficiency Manitoba did not undertake a formal sensitivity analysis for participation as part of the development of the Plan. The goal is to ensure that each

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house/suite completes all retrofits that it is eligible for to maximize the energy savings for each participating house/suite.

REVISED TABLE A5.1 INCOME QUALIFIED ENERGY & GREENHOUSE GAS EMISSIONS SAVINGS
SUMMARY

	2020/21	2021/22	2022/23
No. of retrofits (electric)	3,420	3,990	3,950
No. of houses/suites (electric)	500	500	490
Annual electric savings (GWh) (at generation)	2.53	2.70	2.65
Annual capacity savings (MW) (at generation)	0.94	0.95	0.93
No. of retrofits (natural gas)	3,240	3,700	3,900
No. of houses/suites (natural gas)	1,300	1,280	1,270
Annual natural gas savings (million m³)	1.08	1.07	1.09
Annual GHG emission reductions (tonnes CO₂e)	2,000	2,000	2,000

Highlighted sections have been revised.

One house/suite participating in Income Qualifying Offers may undergo one or more retrofit(s).

One retrofit is defined as follows:

- Installation of water and energy savings devices (energy efficient showerheads and faucet aerators)
- Installation of LED bulbs
- Air sealing measures (window insulating kits, electrical socket draft stoppers and caps, and hot water tank pipe wrap)
- Insulation upgrades
- Standard efficiency furnace to high efficiency furnace upgrade
- Mid efficiency furnace to high efficiency furnace upgrade (considered for enhancement in 2022)
- Boiler upgrade
- Smart thermostat
- Front load clothes washer

The following tables have also been revised:

- Table 5.8 (2020/23 Efficiency Plan, Section 5.5.1, p.142 of 591)
- Table 5.9 (2020/23 Efficiency Plan, Section 5.5.2, p.142 of 591)
- Annual Natural Gas Participation and Annual Electric Participation (2020/23 Efficiency Plan, Attachment 3 – Technical Tables, pages 512 and 518 of 591)
 - Annual Natural Gas Participation (2020/23 Efficiency Plan, Attachment 3, p.512 of 591) – Please see the attachment to this response.
 - Annual Electric Participation (2020/23 Efficiency Plan, Attachment 3, p.518 of 591) – Please see the attachment to this response.

REVISED TABLE 5.1 ANNUAL AVERAGE ELECTRIC CUSTOMER PARTICIPATION & BILL SAVINGS

Customer segment / program bundle		Annual average electric bill savings	Total annual electric bill savings
Indigenous	Homes	\$470/house	\$147,000
	Small business	\$900/business	
Income qualified		\$410/house	\$203,000
Residential		\$80/house	\$1,769,000
Commercial, industrial & agricultural	Small business	\$1,000/business	\$12,567,000
	Suites	\$60/suite	
	Other business	\$4,300/business	
Emerging Technology Programs		\$1,500/project	\$171,000
Total annual electric customer bill savings			\$14,857,000

Highlighted sections have been revised.

**2020-2023 Efficiency Plan
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REVISED TABLE 5.2 ANNUAL AVERAGE NATURAL GAS CUSTOMER PARTICIPATION & BILL SAVINGS

Customer segment / program bundle		Annual average natural gas bill savings	Total annual natural gas bill savings
Indigenous		\$300/house	\$14,000 (natural gas) <u>\$4,000 (carbon charge)</u> \$18,000
Income qualified		\$290/house	\$287,000 (natural gas) <u>\$82,000 (carbon charge)</u> \$369,000
Residential		\$20/house	\$426,000 (natural gas) <u>\$131,000 (carbon charge)</u> \$557,000
Commercial, industrial & agricultural	Small business	\$70/business	\$1,452,000 (natural gas) <u>\$567,000 (carbon charge)</u> \$2,019,000
	Suites	\$20/suite	
	Other business	\$3,800/business	
Emerging Technology Programs		< 10 projects	\$23,000 (natural gas) <u>\$9,000 (carbon charge)</u> \$32,000
Total annual natural gas customer bill savings			\$3,000,000

Highlighted sections have been revised.

REFERENCE:

Efficiency Manitoba 2020/2023 Efficiency Plan Submission Pdf pages 18 and 280 of 591 Pdf pages 26-28 of 591

PREAMBLE TO IR (IF ANY):

At pdf page 26 of the Plan Efficiency Manitoba states:

149 The results of the PACT indicate that Efficiency Manitoba's overall electric DSM
150 portfolio is expected to result in customers having lower costs for meeting their
151 electricity needs through this portfolio, on an aggregate basis [...].

At pdf pages 27-28 of the Plan Efficiency Manitoba states:

168 Efficiency Manitoba completed a simplified rate and bill impact analysis to provide a
169 directional indicator of the impacts that are associated with the Plan. Efficiency
170 Manitoba has used a lifecycle revenue impact (LRI) measure to indicate an equivalent
171 one-time change in rates (for both electric and natural gas) that is required to
172 establish a balance between the marginal benefits and the revenue
173 reductions/program investments of the Plan, on a net present value basis. LRI was
174 selected as it applies the standard DSM rate impact measure test components and is
175 consistent with the PACT.

Appendix A Section 2 of the Plan does not include information about bill impacts to each customer segment.

At pdf page 141, with respect to Electric Customer Bill Impacts, Efficiency Manitoba states that:

226 The estimated electric rate impacts will apply to all Manitoba electric customers as
227 summarized in Table 5.6. Customers that choose to participate in the programming
228 offered by Efficiency Manitoba will see the same rate impacts but will realize annual
229 bill reductions based on their respective energy savings.

QUESTION:

- a) Please confirm that the results of the PACT indicate that Efficiency Manitoba's overall electric DSM portfolio is expected to result in participating customers having lower costs for meeting their electricity needs through this portfolio.
- b) Please confirm that customer participation in programming offered by Efficiency Manitoba may be a product of availability of programs, and not entirely driven by customer choice.
- c) With respect to the electric DSM portfolio, please explain whether Efficiency Manitoba completed an analysis of the bill impacts associated with the Plan on each customer segment, including specifically the Indigenous customer segment.
 - I. Why or why not?
 - II. If yes to question 2, please provide the analysis completed;
 - III. If no to question 2, please prepare an analysis of the anticipated bill impacts of the Plan on each customer segment, including specifically the Indigenous customer segment.

RATIONALE FOR QUESTION:

To gain an understanding of the anticipated bill impacts of the Plan as proposed on each customer segment, including specifically the Indigenous customer segment

RESPONSE:

- a) As shown in the program administrator cost ratio (PACT) calculation shown in Section A2.3.1 of the 2020/23 Efficiency Plan ("Plan") (Appendix A2, p. 232 of 591), the PACT considers the present value of the marginal benefits against the present value of the program costs and incentives. As the overall electric DSM portfolio has PACT benefits exceeding the costs, means that based on this metric the electric portfolio over the 30-year time horizon considered will lower costs for the electric utility as compared to not pursuing any DSM. As summarized in Table 5.3 (Plan, Section 5.2, p. 135 of 591), the overall electric portfolio PACT is 3.27. Simply stated this means that based on the PACT, every \$1 spent realizes \$3.27 in benefits for electric ratepayers. The PACT does not

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consider utility lost revenue impacts which are considered within the Lifecycle Revenue Impact (LRI) analysis discussed in the Plan (Appendix A2, p. 234 of 591). The PACT does not consider participating customer bill savings discussed in Section 5.5 of the Plan (beginning on p. 141 of 591).

- b) Confirmed.

- c) The Plan, Section 5.5.1 (Table 5.8, p. 142 of 591) provides a table that demonstrates the average electric customer bill savings, including specifically the Indigenous customer segment. This table has been subsequently revised within COALITION/EM I-102.
 - I. This analysis was completed in order to assist the Public Utilities Board with the mandatory considerations of its review of the Efficiency Plan as per the Efficiency Manitoba Regulation 119/2019 Section 11 (g) impact of the plan on rates and average customer bill amounts.
 - II. The analysis can be found in the Plan, Section 5.5.1 (Table 5.8, p. 142 of 591) and in Attachment 3 – Technical Tables (Annual bill Reduction Per Program Bundle (p. 517 of 591). These table has been subsequently revised within COALITION/EM I-102.
 - III. Not applicable.

Please see additional analysis in response to AMC/EM I-10a.

24

REFERENCE:

14-16 (139-141)

31-32 (PDF 234-235)

PREAMBLE TO IR (IF ANY):

Section 5 (page 13) states:

“The current electric and natural rates adjusted for inflation are used to determine the change in revenue from the portfolio’s projected decrease in electric or natural gas consumption.”

Section 5 (page 14) states:

“To illustrate, if a base electric rate of 8¢/kWh is considered, a 0.24 percent one-time equivalent rate increase is determined through the LRI.”

Section 5 (page 15) states:

“if a base natural gas rate of 21¢/m³ is considered, a 1.10% one-time equivalent rate increase is determined through the LRI.”

QUESTION:

- a. In the illustrations, what year are the base electricity and natural gas rates assumed to be associated with?
- b. How does the electricity base rate of 8¢/kWh compare with Manitoba Hydro’s current electricity rates?
- c. How does the natural gas base rate of 21¢/m³ compare with Manitoba Hydro’s (Centra’s) current natural gas rates?
- d. For the purposes of calculating the LRI on a 30-year NPV basis why were electricity and natural gas rates assumed to increase at the rate of inflation (i.e., 1.92% per Table A2.3)?
- e. Please recalculate the values in Tables 5.6 and 5.7 assuming electricity and natural gas rates increase at 3.9% per annum.
- f. Please recalculate the values in Tables 5.6 and 5.7 using a 10-year (as opposed to 30-year) evaluation period.

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- g. Please recalculate the values in Tables 5.6 and 5.7 using a 5-year (as opposed to 30-year) evaluation period.
- h. Do the revenue loss calculations include the lost revenue due to the impact of Codes and Standards or just due to programs?

RATIONALE FOR QUESTION:

To understand the basis for the LRI calculation and the sensitivity of the results.

RESPONSE:

- a. As outlined in the 2020/23 Efficiency Plan, Section A2, p. 236 on lines 646-649, the June 1, 2019 approved electricity rates and the November 2018 approved natural gas rates were used in the analysis.
- b. The electricity base rate used was 8¢/kWh, and the current Manitoba Hydro rates can be found at the following link. https://www.hydro.mb.ca/accounts_and_services/rates/
- c. The natural gas base rate used was of 21¢/m³ (which is a blend of primary gas costs, supplemental gas costs, cost to transport the gas to Manitoba and costs to distribute the gas to customers.) The current Manitoba Hydro rates can be found at the following link. https://www.hydro.mb.ca/accounts_and_services/rates/
- d. The electricity and natural gas rates were inflated using a rate of 1.92% in the LRI analysis to recognize the time value of money and to be consistent with the other financial analyses in the Plan. It should be noted that the Plan reports costs in nominal dollars and a nominal discount rate is used in the analysis, so the inflation rate is not a factor.
- e. Efficiency Manitoba defers any detailed rate analyses and considerations to Manitoba Hydro or Centra Gas.

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COALITION/EM I-33(e) requested recalculation of the values in Tables 5.6 and 5.7 assuming electricity rate and natural gas rate increase at 3.9% per annum. Efficiency Manitoba refused to respond, stating that it defers any detailed rate analyses and considerations to Manitoba Hydro or Centra Gas. The rate increase assumption is a key input to the Rate Impact Test, used for cost-effectiveness analysis, and the assumption used by Efficiency Manitoba is unrealistic based on Manitoba Hydro past filings. For purposes of the Rate Impact Test, the rate increase is an assumption made by Efficiency Manitoba and the calculation could be readily done using Efficiency Manitoba's models.

Additional response from Efficiency Manitoba (December 4, 2019):

Although Efficiency Manitoba does not conclude that the scenario requested in this question represents a realistic scenario based on Manitoba Hydro past filings, the following two tables outline the revised LRI values for the electric portfolio from Table 5.6. The first table assumes a 3.9% increase per annum for 30 years and the second table assumes a 3.9% increase per annum for 10 years.

Electric portfolio - 3.9% per annum increase for 30 years

	One-time equivalent rate increase
Lifecycle revenue impact (¢/kWh)	0.055¢/kWh
Percent increase (using 6¢/kWh)	0.91%
Percent increase (using 8¢/kWh)	0.68%
Percent increase (using 10¢/kWh)	0.55%

Electric portfolio - 3.9% per annum increase for 10 years

	One-time equivalent rate increase
Lifecycle revenue impact (¢/kWh)	0.048¢/kWh
Percent increase (using 6¢/kWh)	0.79%
Percent increase (using 8¢/kWh)	0.60%
Percent increase (using 10¢/kWh)	0.48%

The following two tables outline the revised LRI values for the natural gas portfolio from Table 5.7. The first table assumes a 3.9% increase per annum for 30 years and the second table assumes a 3.9% increase per annum for 10 years.

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Natural gas - 3.9% per annum increase for 30 years

	One-time equivalent rate increase
Lifecycle revenue impact (¢/m ³)	0.39¢/m ³
Percent increase (using 19¢/m ³)	2.04%
Percent increase (using 21¢/m ³)	1.84%
Percent increase (using 23¢/m ³)	1.68%

Natural gas - 3.9% per annum increase for 10 years

	One-time equivalent rate increase
Lifecycle revenue impact (¢/m ³)	0.32¢/m ³
Percent increase (using 19¢/m ³)	1.69%
Percent increase (using 21¢/m ³)	1.53%
Percent increase (using 23¢/m ³)	1.39%

- f. Please see the recalculated Tables 5.6 and 5.7 using a 10-year time period

Table 5.6 – Electric Portfolio

	One-time equivalent rate increase
Lifecycle revenue impact (¢/kWh)	0.062¢/kWh
Percent increase (using 6¢/kWh)	1.04%
Percent increase (using 8¢/kWh)	0.78%
Percent increase (using 10¢/kWh)	0.62%

Table 5.7 - Natural Gas Portfolio

	One-time equivalent rate increase
Lifecycle revenue impact (¢/m ³)	0.45¢/m ³
Percent increase (using 19¢/m ³)	2.36%
Percent increase (using 21¢/m ³)	2.13%
Percent increase (using 23¢/m ³)	1.95%

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- g. Please see the recalculated Tables 5.6 and 5.7 using a 5-year time period

Table 5.6 – Electric Portfolio

	One-time equivalent rate increase
Lifecycle revenue impact (¢/kWh)	0.13¢/kWh
Percent increase (using 6¢/kWh)	2.16%
Percent increase (using 8¢/kWh)	1.62%
Percent increase (using 10¢/kWh)	1.30%

Table 5.7 – Natural Gas Portfolio

	One-time equivalent rate increase
Lifecycle revenue impact (¢/m ³)	0.77¢/m ³
Percent increase (using 19¢/m ³)	4.04%
Percent increase (using 21¢/m ³)	3.66%
Percent increase (using 23¢/m ³)	3.34%

- h. The revenue loss calculations include revenue loss from programs but do not include the revenue impacts from Codes and Standards.

- *Discount Period*

As noted in Section 4.1 most of the costs associated with the Plan will be incurred by Efficiency Manitoba during the three-year Plan period and all costs incurred by Efficiency Manitoba will be funded by Manitoba Hydro. In contrast the benefits will be realized by Manitoba Hydro over a longer period of time. As a result, use of a 30 year period will understate the rate adjustments required by Manitoba Hydro over the shorter term (e.g., ten years) to balance revenues, benefits and costs. Efficiency Manitoba has provided LRI values over shorter time horizons and the results are summarized below for both electricity and natural gas¹²⁰:

Table #6 - ELECTRICITY – EQUIVALENT ONE-TIME RATE INCREASE			
Discount Period	BASE RATE (\$/kWh)		
	0.06	0.08	0.10
30-Year	0.32%	0.24%	0.19%
10-Year	1.04%	0.78%	0.62%
5-Year	2.16%	1.62%	1.30%

Table #7 - NATURAL GAS – EQUIVALENT ONE-TIME RATE INCREASE			
Discount Period	BASE RATE (\$/m ³)		
	0.19	0.21	0.23
30-Year	1.22%	1.10%	1.00%
10-Year	2.36%	2.13%	1.95%
5-Year	4.04%	3.66%	3.34%

While it is not known precisely how Manitoba Hydro will recover the funds paid to Efficiency Manitoba over the three year period, Manitoba Hydro's current practice (as

¹²⁰ Section 5, pages 14 & 16 and Coalition/EM I-33 f) & g)

directed by the PUB) is to amortize DSM costs over a 10 year period¹²¹. As a result, the PUB's consideration of rate impacts should focus on the 10-year values as well as the longer term 30-year values.

- *System Energy Values*

For electricity, the system energy values used in the present value calculation were the total forecast General Consumer Sales for 2020/21 and subsequent years per Manitoba Hydro's 2018 Load Forecast¹²².

Not all of the kilowatt hours included in General Consumer Sales are subject to the Manitoba Hydro general rate increases that will recover the costs of Efficiency Manitoba's Plan. Specifically, Manitoba Hydro's general rates increases will not apply to: i) a portion of the sales in the Diesel communities and ii) the Surplus Energy Program (SEP) sales. However, the volumes associated with these sales are small and are unlikely to have a material effect on the overall LRI calculation.

Also, in principle the system energy values used should be adjusted for the anticipated impact of post 2017/18 DSM programs. Efficiency Manitoba acknowledges that using the forecast General Consumer Sales was a simplifying assumption but contends that the results are reasonable¹²³.

Overall, the System Energy inputs used by Efficiency Manitoba in its LRI calculations are reasonable.

- *Lost Revenue Calculation*

For purposes of determining the Lost Revenue to be included in its LRI analysis Efficiency Manitoba assumed that electricity and natural gas rates would both increase at a rate of 1.92%/annum¹²⁴ over the 30 year period. Manitoba Hydro's most recent publically available Integrated Financial Forecast was prepared in the first half of

¹²¹ Manitoba Hydro's 2017/18 & 2018/19 GRA, Coalition/MH I-47 b)

¹²² Coalition/EM I-34 a)

¹²³ Coalition/EM I-31 b)

¹²⁴ Coalition/EM I-33 d)