

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):**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.
- 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).
- 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:**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.

Revised response from Efficiency Manitoba (December 6, 2019):

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. There are no incremental (additional) annual energy savings that exist beyond year 3 of the Plan. In the case of the Load Displacement and Emerging Technology program bundles, activities within the Plan include operating contribution commitments (operating incentives) throughout the duration of potential projects.

- 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.

Further information request/clarification:

MIPUG/EM I-1e) Please provide year-by-year program costs and savings (i.e. energy and capacity savings only) for the 30-Year analysis period. Indicate whether program costs are in real or nominal dollars.

Additional response from Efficiency Manitoba (December 6, 2019):

The following table provides the year-by-year cumulative program only energy savings for both the electric and natural gas portfolio for the 30-year analysis period. For

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certainty, these energy savings do not include codes & standards as this component is not used in the determination of the PACT benefits. Also provided within the table are the year-by-year costs for both the electric and natural gas portfolios for the 30-year analysis period. The 2022/23 through 2041/42 fiscal year budgeted costs include ongoing operating incentives for a small number of customer sited Load Displacement or Emerging Technology program bundle projects. To put these ongoing operating incentive values into context:

- Electric Portfolio:
 - Present value of the 30-year annual budget is \$152 million
 - Present value of the 3-year annual budget is \$138 million
- Natural Gas Portfolio:
 - Present value of the 30-year annual budget is \$60 million
 - Present value of the 3-year annual budget is \$59 million

Year	Annual Energy Savings		Annual Budget	
	Electric (GWh)	Natural Gas (million m ³)	Electric Portfolio (000's \$) (nominal)	Natural Gas Portfolio (000's \$) (nominal)
2020/21	285	8.19	\$44,545	\$18,641
2021/22	485	16.68	\$51,151	\$21,275
2022/23	680	25.39	\$50,983	\$23,047
2023/24	675	25.17		
2024/25	669	25.02		
2025/26	659	24.53		
2026/27	649	23.83		
2027/28	644	23.49		
2028/29	642	23.38		
2029/30	636	23.29		
2030/31	620	22.31		
2031/32	527	21.26		
2032/33	413	20.11		
2033/34	320	19.94		
2034/35	293	19.70		
2035/36	163	15.15		
2036/37	116	12.49		
2037/38	68	11.00		
2038/39	64	11.19		
2039/40	60	11.35		

Electric
Column 1c
and 4a

Natural Gas
Column 2b
and 4a

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2040/41	56	13.10		
2041/42	50	14.34		
2042/43	43	15.40	-	-
2043/44	42	15.41	-	-
2044/45	40	15.41	-	-
2045/46	37	12.66	-	-
2046/47	31	8.44	-	-
2047/48	20	3.13	-	-
2048/49	19	3.16	-	-
2049/50	19	3.19	-	-

- 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.

Further information request/clarification:

MIPUG/EM I-1g) Please provide confirmation of whether a real or nominal discount rate is used for determination of levelized energy consumption during the 30-Year analysis period.

Additional response from Efficiency Manitoba (December 6, 2019):

Efficiency Manitoba uses a real discount rate for determination of levelized energy consumption during the 30-year analysis period. As provided in Table A2.3 (Plan, Section A2.3.1, p. 232 of 591), the real weighted average cost of capital rate used is 4.00%.

- 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.

Further information request/clarification:

MIPUG/EM I-1h) Can the measure life and persistence levels each program measure be provided?

Additional response from Efficiency Manitoba (December 17, 2019):

The requested data has been provided. Please see attachment to MIPUG/EM I-1h.

- 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

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

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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-1l.
- 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.

Further information request/clarification:

MIPUG/EM I-1n) Please provide the undiscounted sum of the marginal benefits for the electric portfolio for Years 16-30 and note whether this sum is in real or nominal dollars.

Additional response from Efficiency Manitoba (December 6, 2019):

The marginal benefits of the electric portfolio contain commercially sensitive information. 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.

- 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”).

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

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):

$$\text{RIM} = \frac{(\text{PV}) \text{ Utility Marginal Benefits}}{\text{PV(Revenue loss} + \text{Utility Program Costs} + \text{Incentives)}}$$

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.

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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

BUNDLES	MEASURES	CUSTOMER SEGMENT	FREE RIDERS %	FREE RIDERS \$	INCENTIVE AMOUNT \$	% OF INCREMENTAL COST COVERED	Persistence Factor	Measure Life (years)	
DIRECT INSTALL OFFERS	Online Home Energy Questionnaire	Residential	N/A	N/A	N/A	N/A	N/A	N/A	
	Home Energy Check-Up	Residential	N/A	N/A	Average of \$12.23	100%	61%	10	
	Free cost energy-efficient upgrades								
	- Up to two energy-efficient showerheads (5.7 LPM)	Residential	5%	5%	Average of \$12.23	100%	61%	10	
	- One energy-efficient kitchen aerator (5.7 LPM)	Residential	5%	5%	\$1.29	100%	88%	10	
	- Up to two energy-efficient bathroom aerators (5.7 LPM)	Residential	5%	5%	\$1.29	100%	88%	10	
	- Water heater pipe wrap insulation	Residential	5%	5%	\$1.65	100%	100%	10	
	- Shower timer	Residential	5%	5%	\$5.00	100%	5%	4	
	- Up to five LED bulbs	Residential	5%	5%	\$3.00	100%	95%	17	
	- Tier 2 advanced power strips	Residential	20%	20%	\$50.00	100%	80%	4	
- Window insulating kits	Residential	5%	5%	\$14.00	100%	95%	7		
- Weatherstripping	Residential	5%	5%	\$2.00	100%	90%	6		
- Outdoor car plug timers	Residential	5%	5%	\$2.00	100%	80%	10		
Incentive-based energy-efficient upgrades									
- Heat recovery ventilator (ERV) controls	Residential	5%	5%	\$10.00	60%	50%	20		
- Smart thermostats	Residential	5%	5%	\$50.00	13%	100%	10		
PRODUCT REBATE OFFERS	Retail Rebates								
	- ENERGY STAR certified LED bulbs	Residential	40%	3%	10% to 30%	10% to 30%	70%	17	
	- ENERGY STAR certified integrated LED fixtures	Residential	27.5%	3%	\$5.00	25%	85%	28	
	- Lighting controls	Residential	5%	0%	\$3.00	1%	80%	4	
	- Outdoor car plug timers	Residential	20%	0%	\$5.00	28%	80%	10	
	- Smart plugs	Residential	20%	0%	\$5.00	14%	80%	4	
	- Energy-efficient showerheads (5.7 LPM)	Residential	5%	0%	\$10.00	50%	95%	10	
	- Tier 1 advanced power strips	Residential	20%	0%	\$10.00	20%	80%	4	
	- Window insulating kits	Residential	35%	0%	\$3.00	2%	95%	7	
	- Weatherstripping	Residential	40%	0%	\$3.00	7%	100%	15	
- ENERGY STAR certified clothes washers & washer/dryer pairs	Residential	40%	0%	\$30.00	2%	100%	12		
- ENERGY STAR certified dishwashers	Residential	40%	0%	\$25.00	2%	100%	12		
- ENERGY STAR certified smart thermostats	Residential	25%	0%	\$50.00	18%	100%	10		
- Dishwashers (lowenergy, all-spec events)	Residential	20%	0%	\$10.00	30%	7%	10		
HOME RENOVATION	Appliance Recycling Program								
	- Refrigerators	Residential	20%	0%	\$30.00	7%	100%	10	
	- Freezers	Residential	20%	0%	\$30.00	7%	100%	10	
	- Dishwashers	Residential	40%	0%	\$50.00	0%	100%	4	
	- Window air conditioners	Residential	65%	0%	\$10.00	0%	100%	3	
	- Bar fridges	Residential	65%	0%	\$50.00	0%	100%	10	
	Rebates								
	- Insulation (attic wall foundation)	Residential	30%	10%	4Rfc and knee wall 2x sq ft, R added R-value up to R-30 wall cavities and foundation, 4E x sq ft R added R-value up to R-24 exterior walls, 4E sq ft R added R-value up to R-30	up to 100% of material cost	100%	30	
	- Air Sealing	Residential	30%	10%	\$100.00	90%	90%	15	
	- Doors	Residential	40%	7%	\$50.00	53%	100%	25	
- Windows	Residential	40%	7%	\$50.00	53%	100%	25		
- Drain water heat recovery	Residential	2%	0%	\$200.00	60%	100%	30		
- H2O Controls	Residential	8%	8%	\$100.00	60%	50%	20		
- Smart thermostats	Residential	20%	0%	\$50.00	18%	100%	10		
- Geothermal	Residential	N/A	0%	Average of \$300.00	5%	100%	20		
- Pool pumps	Residential	10%	10%	\$300	43%	95%	7		
- Air source heat pumps	Residential	25%	0%	Average of \$200.00	19%	100%	15		
- Clothes washers & dryers	Residential	40%	0%	\$100.00	7%	100%	15		
- Refrigerators	Residential	40%	0%	\$29.00	2%	100%	17		
- Dishwashers	Residential	40%	0%	\$25.00	2%	100%	17		
- Home Energy Audit and Bonus Incentive	Residential	0%	0%	\$750.00	300%	0%	0		
Loans	- Building envelope, space and water heating, ventilation, emergency technologies, custom energy efficiency projects	Residential	N/A	N/A	N/A	N/A	N/A	N/A	
NEW HOMES & MAJOR RENOVATION OFFERS	New Homes								
	- Individual measures	Residential	30%	30%	\$100-\$200 per measure	34%	100%	25	
	- Prescriptive Path	Residential	15%	15%	\$1200 per home	26%	100%	35	
	- Performance Path	Residential	15%	15%	\$1500-\$12,000 per home + modeling costs, \$50/GJ for gas savings, \$100/GJ for electric savings (plus rebate for Electric/Gas and gas and electric)	22% for electric projects, 19% for gas projects	100%	35	
	Major Renovation	Residential	30%	0%		34% for electric projects, 23% for gas projects	100%	25	
	HOME ENERGY EFFICIENCY KITS & EDUCATION OFFERS	Energy Efficiency Kits							
		- Up to two energy-efficient showerheads (5.7 LPM)	Residential	0%	0%	\$1.98	100%	61%	10
		- One energy-efficient kitchen aerator (5.7 LPM)	Residential	0%	0%	\$1.29	100%	88%	10
		- Up to two energy-efficient bathroom aerators (5.7 LPM)	Residential	0%	0%	\$1.50	100%	88%	10
		- Water heater pipe wrap insulation	Residential	0%	0%	\$1.65	100%	100%	10
- Shower timer		Residential	0%	0%	\$5.00	100%	5%	4	
- Up to five LED bulbs		Residential	0%	0%	\$3.00	100%	95%	17	
- Tier 2 advanced power strip		Residential	20%	0%	\$50.00	100%	80%	4	
- Window insulating kit		Residential	0%	0%	\$14.00	100%	95%	7	
- Weatherstripping		Residential	0%	0%	\$2.00	100%	90%	6	
- Outdoor car plug timer	Residential	0%	0%	\$10.00	100%	80%	10		
- Call center	Residential	0%	0%	\$8.00	100%	7%	10		
INCOME QUALIFIED	Single-Serve Detailed								
	- Home Energy Check-Up (includes air sealing)	Residential Income Qualified	0%	0%	Average of \$146.74	100%	100%	7	
	- Energy-saving and water-saving devices (no LEDs)	Residential Income Qualified	0%	0%	Average of \$4.49	100%	61/100%	10	
	- Air sealing measures (included in Home Energy Check-Up)	Residential Income Qualified	0%	0%	Included with Home Energy Check-Up	100%	96%	28	
	- LEDs	Residential Income Qualified	0%	0%	Average of \$13.50	100%	96%	17	
	- Insulation upgrades	Residential Income Qualified	0%	0%	Average of \$194.88	100%	30	30	
	- Additional basement upgrades (requiring extra assistance)	Residential Income Qualified	0%	0%	Average of \$500.00	100%	100%	30	
	- Gas Furnace Upgrade - from a standard efficient furnace	Residential Income Qualified	0%	0%	\$3,830.00	87%	100%	10	
	- Gas Furnace Upgrade - from a standard efficient furnace	Residential Income Qualified	0%	0%	\$2,000.00	50%	100%	10	
	- Boiler Upgrade	Residential Income Qualified	0%	0%	\$3,000.00	35%	100%	10	
- Front Load Clothes Washer	Residential Income Qualified	0%	0%	\$800.00	100%	100%	15		
- Smart Thermostat	Residential Income Qualified	0%	0%	\$350.00	100%	100%	10		
MURBS									
- Air Sealing Measures	Residential Income Qualified	0%	0%	Average of \$5.12	100%	100%	10		
- Energy-saving and water-saving devices	Residential Income Qualified	0%	0%	Average of \$7.24	100%	61-75%	10		
- LEDs	Residential Income Qualified	0%	0%	Average of \$4.51	100%	96%	17		
FIRST NATION INSULATION AND DIRECT INSTALL OFFERS	Home energy efficiency upgrades								
	- Insulation	Indigenous	0%	0%	\$110.00	100%	100%	30	
	- 15 GPM Bathroom Aerator	Indigenous	0%	0%	\$1.50	100%	88%	10	
	- 15 GPM Kitchen Aerator	Indigenous	0%	0%	\$2.00	100%	88%	10	
	- 15 GPM Shower head standard	Indigenous	0%	0%	\$40.75	100%	61%	10	
	- 15 GPM Shower head handheld	Indigenous	0%	0%	\$50.00	100%	61%	10	
	- LED lamps	Indigenous	0%	0%	\$4.50	100%	96%	17	
	- Air sealing safety caps (1 pack)	Indigenous	0%	0%	\$1.00	100%	100%	10	
	- Air sealing socket gaskets (2)	Indigenous	0%	0%	\$5.88	100%	100%	10	
	- All sealing window kits (2)	Indigenous	0%	0%	\$15.44	100%	100%	10	
- Pipe wrap	Indigenous	0%	0%	\$1.68	100%	100%	10		
- Smart Thermostats	Indigenous	0%	0%	\$300.00	100%	100%	10		
- ENERGY STAR certified clothes washers	Indigenous	0%	0%	\$800.00	100%	100%	15		
INDIGENOUS SMALL BUSINESS OFFERS	Product rebates								
	- Kitchen aerators	Indigenous	0%	0%	100% of material and labour cost	100%	75%	10	
	- Bathroom aerators	Indigenous	0%	0%	100% of material and labour cost	100%	75%	10	
	- Pre-rinse spray valves	Indigenous	0%	0%	100% of material and labour cost	100%	95%	4	
	- A-line LED bulbs	Indigenous	8%	0%	100% of material and labour cost	100%	90%	9	
	- Dimmer switches	Indigenous	3%	0%	100% of material and labour cost	100%	100%	17	
	- TB ballasts	Indigenous	3%	0%	100% of material and labour cost	100%	90%	10	
	- LED TB linear lamps	Indigenous	3%	0%	100% of material and labour cost	100%	90%	18	
	- TB energy-efficient lamps	Indigenous	3%	0%	100% of material and labour cost	100%	90%	18	
	- TB ballast fixtures	Indigenous	3%	0%	100% of material and labour cost	100%	90%	18	
- Specialty LED lamps	Indigenous	3%	0%	100% of material and labour cost	100%	90%	4		
- Exit signs	Indigenous	3%	0%	100% of material and labour cost	100%	90%	4		
- Showersheds	Indigenous	N/A	N/A	N/A	N/A	N/A	N/A		
- Smart thermostats	Indigenous	3%	0%	100% of material and labour cost	100%	100%	10		
- Cross promote HVAC and controls offers	Indigenous	N/A	N/A	N/A	N/A	N/A	N/A		
- Cross promote renovation offers	Indigenous	N/A	N/A	N/A	N/A	N/A	N/A		
COMMUNITY GEOTHERMAL	Geothermal heat pumps	Indigenous	0%	0%	\$4,000.00	100%	100%	25	
	METIS INCOME QUALIFIED	Home energy efficiency upgrades							
		- Home Energy Assessment	Indigenous	0%	0%	\$135.00	100%	100%	1
		- Insulation	Indigenous	0%	0%	\$1,980.00	100%	100%	30
		- Natural gas furnace or boiler	Indigenous	0%	0%	\$2,000-\$3,830	100%	100%	10
		- Energy-saving and water-saving devices	Indigenous	0%	0%	Average of \$14.66	100%	61/100%	10
		- LEDs	Indigenous	0%	0%	\$4.50	100%	96%	17
		- Air sealing measures	Indigenous	0%	0%	Average of \$5.50	100%	50-100%	10
		- Smart Thermostats	Indigenous	0%	0%	\$350.00	100%	100%	10
		- ENERGY STAR certified clothes washers	Indigenous	0%	0%	\$800.00	100%	100%	15
SMALL BUSINESS & APPLIANCE OFFERS		Commercial kitchen appliances							
	- Dishwashers	Commercial, Industrial, Agricultural	10%	0%	\$1,500.00	60%	100%	12	
	- Fryers	Commercial, Industrial, Agricultural	10%	0%	\$50-\$100.00	57%-63%	100%	12	
	- Convection ovens	Commercial, Industrial, Agricultural	10%	0%	\$50-\$100.00	70%	100%	12	
	- Dishwashers	Commercial, Industrial, Agricultural	10%	0%	\$200-\$250	33%-50%	100%	10-20 based on type	
	- Griddles	Commercial, Industrial, Agricultural	10%	0%	\$60-\$200	50%-100%	100%	12	
	- Hot food holding cabinets	Commercial, Industrial, Agricultural	1%	0%	\$80-\$100.00	66%	100%	12	
	Commercial refrigeration equipment								
	- New vertical display case with standard doors	Commercial, Industrial, Agricultural	10%	0%	\$100-\$300/ft	40%	100%	12	
	- New vertical display case with special (heat free) doors	Commercial, Industrial, Agricultural	10%	0%	\$50/ft (above \$100/ft) or \$100/ft (above \$100/ft)	40%	100%	12	
- Anti-sweat heater (ASH) cabinet	Commercial, Industrial, Agricultural	10%	0%	\$100/door (range), \$100/door (range), \$100/door (range)	60%	100%	12		
- Night covers	Commercial, Industrial, Agricultural	10%	0%	\$10/ft (range), \$10/ft (range), \$10/ft (range)	up to 100%	100%	1		
- High efficiency compressor	Commercial, Industrial, Agricultural	10%	0%	\$100/ft	43%	100%	15		
- ECM compressor fan motors	Commercial, Industrial, Agricultural	10%	0%	\$30/ft (range), \$30/ft (range), \$30/ft (range)	up to 100%	100%	15		
- Strip curtains	Commercial, Industrial, Agricultural	10%	0%	\$30/ft (range), \$30/ft (range), \$30/ft (range)	up to 100%	100%	15		
- Automatic door closers	Commercial, Industrial, Agricultural	10%	0%	\$50/door (range), \$50/door (range), \$50/door (range)	up to 100%	100%	4		
- LED display case and walk-in box lighting	Commercial, Industrial, Agricultural	10%	0%	\$1/ft (range), \$1/ft (range), \$1/ft (range)	up to 100%	100%	15		
- Door gaskets	Commercial, Industrial, Agricultural	10%	0%	\$1/ft (range), \$1/ft (range), \$1/ft (range)	up to 100%	100%	4		
- Capacitor efficiency controller	Commercial, Industrial, Agricultural	10%	0%	\$400/controller	20%	100%	15		
IN-SITE EFFICIENCY	Small Business								
	- Kitchen aerators	Commercial, Industrial, Agricultural	0%	0%	100% of material and labour cost	100%	75%	10	
	- Bathroom aerators	Commercial, Industrial, Agricultural	0%	0%	100% of material and labour cost	100%	75%	10	
	- Pre-rinse spray valves	Commercial, Industrial, Agricultural	0%	0%	100% of material and labour cost	100%	95%	4	
	- A-line LED bulbs	Commercial, Industrial, Agricultural	8%	0%	100% of material and labour cost	100%	90%	9	
	- Dimmer switches	Commercial, Industrial, Agricultural	3%	0%	100% of material and labour cost	100%	100%	17	
	- TB ballasts	Commercial, Industrial, Agricultural	3%	0%	100% of material and labour cost	100%	90%	10	
	- LED TB linear lamps	Commercial, Industrial, Agricultural	3%	0%	100% of material and labour cost	100%	90%	18	
	- TB energy-efficient lamps	Commercial, Industrial, Agricultural	3%	0%	100% of material and labour cost	100%	90%	18	
	- TB ballast fixtures	Commercial, Industrial, Agricultural	3%	0%	100% of material and labour cost	100%	90%	18	
- Specialty LED lamps	Commercial, Industrial, Agricultural	3%	0%	100% of material and labour cost	100%	90%			

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.

- 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:**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 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.

**2020-2023 Efficiency Plan
MIPUG/EM I-2a-h (Revised)**

Annual Electric Energy Savings (GW.h) Comparison				
		20 20 / 21	20 21 / 22	20 22 / 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>				

**2020-2023 Efficiency Plan
MIPUG/EM I-2a-h (Revised)**

Annual Electric Capacity Savings (MW)				
		20 20 / 21	20 21 / 22	20 22 / 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>				

**2020-2023 Efficiency Plan
MIPUG/EM I-2a-h (Revised)**

TOTAL Annual Electric Costs (000's \$)				
		20 20 / 21	20 21 / 22	20 22 / 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>				

**2020-2023 Efficiency Plan
MIPUG/EM I-2a-h (Revised)**

Electric Program Cost-Effectiveness Metrics		PACT		
		Ratio (A)	PACT NPV (000's \$)	Levelized Cost (cents/ kW h) (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
<i>Note: May not add up due to rounding.</i>				

Further information request/clarification:

MIPUG/EM I-2h) Please provide the following values used in the LRI calculation for the electric portfolio with programs having a levelized cost above 3.14 cents per kWh removed (i.e. as identified in the tables provided in the response). Retain costs, benefits, savings and lost revenue arising from Indigenous and Income Qualified programs in these values:

- PV Program Costs & Incentives
- PV Revenue Losses
- PV Marginal Benefits, and
- PV System Energy

Additional response from Efficiency Manitoba (December 6, 2019):

The following provides the additional requested information as available:

- PV Program Costs & Incentives = \$132 million
- PV Revenue Losses

The requested PV of revenue losses to support 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.

- PV Marginal Benefits = \$454 million
- PV System Energy = 460,000 GWh (as provided in MIPUG/EM I-1o)

REFERENCE:

Marginal Values and Capital Investment Deferral, pdf page 25, marginal values at pdf page 134, 135, 228 and 516 of 591

PREAMBLE TO IR (IF ANY):

EM explains on pdf page 25 that the plan supports the deferral of future capital investment. EM cites that there is value in the deferral of future capital investment and indicates a representative portfolio weighted marginal value of 7.33 cents/kW.h on pdf page 134.

EM states on pdf page 228 that:

Manitoba Hydro provides the energy and capacity marginal values to Efficiency Manitoba for annual and seasonal time frames. Efficiency Manitoba understands that the marginal values include projected capital deferral value due to winter capacity savings and value projected in the export market.

QUESTION:

- a. Please confirm the 7.33 cents/kW.h (per pdf page 134 of 591) is determined solely by multiplying the PACT ratio by the levelized cost at the portfolio level, i.e. 3.27 cents/kWh multiplied by 2.24 cents/kWh (from pdf page 259).
- b. Please confirm a program bundle specific marginal cost could be calculated by multiplying the program specific PACT ratio by the program specific levelized cost. If not confirmed, please indicate why this calculation is not valid.
- c. Please provide a version of pdf page 511 for natural gas and pdf page 516 for electricity with the marginal value by program bundle shown, calculated as indicated in (b) above.
- d. PUB/MH II-57 (Revised) dated 2017-12-18 from the 2017/18 & 2018/19 GRA publicly provides marginal values by generation, transmission and distribution as follows:

**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%

Please confirm whether the methodology undertaken for the above values is the same as undertaken by EM and if confirmed, please update the table for EM's Plan.

- e. Please break out the relevant marginal value for the portfolio cited by EM at 7.33 cents/kW.h by generation, transmission and distribution benefits. This should be completed by following the same economic evaluation as was completed using the overall vertically integrated marginal value but completing the analysis separately for each functional marginal value.
- f. Please provide a copy of documentation underlying the derivation of each of Manitoba Hydro's transmission and distribution marginal benefits.
- g. In relation to the document produced by Manitoba Hydro in GAC/MH-1-39 Attachments from the 2017/18 and 2018/19 GRA (for transmission), please indicate if there have been any updates to the values used since that document was prepared or whether the same document was relied upon.
- h. Please indicate if any geographic distinction was included in marginal values related to areas of the province with transmission and/or distribution constraints.
- i. Per pdf page 228 (lines 491-493) referenced in the pre-ambule above, EM provides a brief description of the EM understanding of Manitoba Hydro's marginal values. Please provide a full description of EM's understanding of the basis of Manitoba Hydro's marginal values in respect of each of generation energy, generation capacity, transmission, and distribution in respect of asset deferral, added export values, reduced domestic thermal generation, etc. and the relative importance of these values in the determination of the marginal value over the 30-year horizon (if the relative importance of various factors changes over time).
- j. Please confirm the value cited at pdf page 135 line 127 should be 18.45 cents/m3, not 18.45 cents/kW.h

RATIONALE FOR QUESTION:

MIPUG wishes to understand and test the cost-effectiveness of EM's portfolio and individual programs of the proposed plan, including through marginal values and benefits of capital investment deferrals.

RESPONSE:

- a) Confirmed
- b) Confirmed
- c) Please see PUB/EM I-11.
- d) Manitoba Hydro is responsible for the calculation of marginal values and Efficiency Manitoba is not in a position to provide a response to this request.
- e) The values provided in MIPUG/EM I-3c above were determined by Efficiency Manitoba as all-in values that include generation, transmission and distribution benefits only on an aggregated basis.
- f) Efficiency Manitoba is not in possession of the requested documentation.
- g) The determination of the marginal values is done independently by Manitoba Hydro, and Efficiency Manitoba accepts and applies the values as received.
- h) There is no geographic distinction included in the marginal values provided by Manitoba Hydro and received by Efficiency Manitoba.
- i) Efficiency Manitoba has provided its understanding of the basis of the marginal values provided by Manitoba Hydro in Daymark/EM I-20a.
- J) Confirmed.

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.

- 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

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

- 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.

REFERENCE:

3-year Plan, pdf pages 227 and 444 of 591

PREAMBLE TO IR (IF ANY):

EM states on pdf page 227 regarding Persistence Factor that:

The persistence factor relates to the percentage of energy-efficient measures that remain installed over the product lifetime. Some customers never install a technology even though they have purchased it, some technologies stop working, and some technologies are removed by customers prior to the end of their product life. The persistence factor is determined for each technology based on a number of factors including customer surveys, engineering estimates, program experience with the technology, program evaluations results, feedback from industry partners, utilities and common practices in the energy efficiency industry.

QUESTION:

- a. Please indicate the “persistence factor” used for each program bundle for each year of the EM 30-year projection horizon.
- b. The persistence description at page 444 addresses changes to the measure installed (per-sale impacts) but does not reference changes to the marketplace. Please provide a detailed description, with quantification, of the EM adjustments for persistence related to changes in the marketplace. For example, if EM assists in the installation of an LED streetlight, there would be savings from the change made in year one, however by year 29 is it assumed that (if the streetlight is still in service) EM claims these savings as part of energy efficiency programming, or would the assumed marketplace evolution (where all streetlights available on the market become LED) at some point in the 30-year period mean the EM “advancement” of LED technology no longer has any persisting value as a savings measure?
- c. Please explain how and why the persistence factor differs by customer group (residential, income qualified, indigenous, commercial, industrial, agricultural) for both per-sale impacts and for changes in the marketplace.

RATIONALE FOR QUESTION:

EM references adjustments for savings persistence tied to the product lifetime. MIPUG wishes to explore how persistence was taken into account in respect of market changes.

RESPONSE:

- a) Persistence factors are a measure level attribute and are not applicable at the bundle level. Please see response to DAYMARK/EM I-85 a-c. Efficiency Manitoba has provided the corresponding electronic workpapers to Daymark based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark.
- b) The persistence factor, as defined in the 2020/23 Efficiency Plan, Attachment 1 – Glossary, p.444 of 591 is not intended to be used to reflect changes in the marketplace, rather, it is used to reflect the level to which an energy-efficient measure remains installed over the product lifetime.

Changes in the marketplace, such as an increased uptake of a specific energy-efficient measure over time, are accounted for through other adjustments. Such an adjustment includes increased levels of free-ridership (as defined in the 2020/23 Efficiency Plan, Attachment 1 – Glossary, p.443 of 591), recognizing that over time, a higher percentage of program participants would have installed the energy-efficiency measure, or taken the energy efficiency action, without the program.

Changes in the marketplace can also be reflected through adjustments to the assumed baseline technology which is being used to calculate savings when compared to the energy-efficiency measure, thus reducing claimed savings. Such an adjustment can be made to reflect changes as they relate to a code, standard or regulation, or can simply be made to reflect observed changes in the market.

- c) Persistence factor, for the same energy-efficient measure, could differ by customer group if it is deemed there may be differences in the likelihood that the measure remains installed over the product lifetime.

REFERENCE:

Section 6 and Section A3 including:

- Figure 6.1 Electric Portfolio Savings & Target Summary (pdf page 159 of 591)
- Figure A3.1 Electric Energy Savings Summary (pdf page 249 of 591)
- Figure 6.3 Electric Portfolio – Annual Savings Summary (pdf page 161 of 591)
- Figure A3.2 Electric Energy Savings Summary (pdf page 250 of 591)
- Figure 6.4 Electric Portfolio – Annual Budget Summary (pdf page 162 of 591)
- Figure A3.5 Electric Budget Summary (pdf page 255 of 591)

PREAMBLE TO IR (IF ANY):

Figures 6.1 and A3.1 provide graphical representations of annual electric portfolio savings by customer segment with annual code & standards savings for all customer segments combined and shown as a separate category.

Figure 6.3 provides a graphical representation of annual electric portfolio savings by customer segment, while Figure A3.2 expands this presentation to include annual electric energy savings per customer segment by program bundle, including annual codes & standards savings per customer segment.

Figure 6.4 provides a graphical representation of annual electric portfolio budget summary by customer segment, with annual budget for enabling strategies (i.e. including codes & standards) and overhead shown separately. Figure A3.5 expands this presentation to include annual electric budget per customer segment by program bundle, excluding annual budget for achieving codes & standards savings.

QUESTION:

- a. Please provide the numerical data used to create the above referenced figures in a tabular format for each year of the 3-year Plan using the customer segment and program bundle categories shown in the graphical representations.
- b. Please confirm that Figure 6.3 is inclusive of electric savings for codes & standards. If not confirmed, please provide an updated Figure that does include codes & standards.

- c. Please confirm that Figure A3.5 does not include budget for codes & standards savings. If not confirmed, please provide Figure A3.5 removing budget for codes & standards savings.
- d. Please confirm that no emerging standards or codes & standards savings or budget are included for the industrial customer segment in Figures A3.2 and A3.5.
- e. In a table similar to that provided for Figure A3.2, please provide the annual program bundle electric capacity savings by customer segment.

RATIONALE FOR QUESTION:

MIPUG is assessing the cost-effectiveness and impacts of EM's plan and requires supporting data.

RESPONSE:

- a. Please see below for the numerical data used to create the above referenced figures in a tabular format for each year of the 3-year Plan using the customer segment and program bundle categories shown in the graphical representations.

Figure 6.1 Electric Portfolio Savings & Target Summary (pdf page 159 of 591)

	2020-21 Savings (GWh)	2021-22 Savings (GWh)	2022-23 Savings (GWh)
Agricultural	12.89	11.81	13.06
Commercial	99.56	98.32	94.16
Industrial	146.26	160.78	156.40
Income Qualified	2.53	2.70	2.65
Indigenous	1.47	2.10	2.21
Residential	22.39	24.45	26.40
Codes & Standards	87.97	102.91	108.37
Target	390.71	390.43	388.66

Figure A3.1 Electric Energy Savings Summary (pdf page 249 of 591)

	2020-21 Savings (GWh)	2021-22 Savings (GWh)	2022-23 Savings (GWh)
Agricultural	12.89	11.81	13.06
Commercial	99.56	98.32	94.16
Industrial	146.26	160.78	156.40
Income Qualified	2.53	2.70	2.65
Indigenous	1.47	2.10	2.21
Residential	22.39	24.45	26.40
Codes & Standards	87.97	102.91	108.37
Target	390.71	390.43	388.66

Figure 6.3 Electric Portfolio – Annual Savings Summary (pdf page 161 of 591)

	2020-21 Savings (GWh)	2021-22 Savings (GWh)	2022-23 Savings (GWh)
Agricultural	12.89	11.81	13.06
Commercial	133.35	137.84	135.79
Industrial	146.26	160.78	156.40
Income Qualified	2.53	2.70	2.65
Indigenous	1.47	2.10	2.21
Residential	76.58	87.84	93.15

Figure A3.2 Electric Energy Savings Summary (pdf page 250 of 591)

	2020-21 Savings (GWh)	2021-22 Savings (GWh)	2022-23 Savings (GWh)
Industrial	146.26	160.78	156.40
Emerging Technology	0.00	0.00	0.00
New Construction & HPB	0.40	0.50	0.40
Custom	17.91	13.10	20.95
Renovation	28.94	26.67	24.61
Load Displacement	99.00	120.52	110.45
Agricultural	12.89	11.81	13.06
New Construction & HPB	0.00	0.00	0.00
Emerging Technology	0.00	0.60	1.02
Custom	3.42	2.50	3.99
Renovation	9.47	8.72	8.04
Commercial	133.35	137.84	135.79
Emerging Technology	0.00	0.38	0.43
In-Suite Efficiency	0.67	1.01	1.34
Custom	2.84	2.32	3.62
HVAC & Controls	3.31	3.47	3.53
New Construction & HPB	5.61	8.25	6.76
Small Business & Appliance	14.82	15.21	15.63
Codes & Standards	33.79	39.53	41.62
Renovation	72.32	67.67	62.86
Residential	76.58	87.84	93.15
Emerging Technology	0.00	0.00	4.45
Home EE Kits & Education	0.58	0.97	0.97
Direct Install	1.23	1.92	2.55
Home Renovation	2.96	6.23	6.09
New Homes & MR	3.32	3.63	3.67
Product Rebates	14.31	11.72	8.67
Codes & Standards	54.19	63.39	66.75
Indigenous	1.47	2.10	2.21
Insulation and Direct Install	0.15	0.30	0.34
Metis Income Qualified	0.18	0.19	0.19
Small Business	0.37	0.37	0.44
Community Geothermal	0.77	1.24	1.24
Income Qualified	2.53	2.70	2.65
Income Qualified	2.53	2.70	2.65
Grand Total	373.07	403.08	403.26

Figure 6.4 Electric Portfolio – Annual Budget Summary (pdf page 162 of 591)

	2020-21 Costs	2021-22 Costs	2022-23 Costs
Industrial	\$ 7,874,000	\$ 12,077,000	\$ 10,281,000
Agricultural	\$ 1,990,000	\$ 1,961,000	\$ 2,170,000
Commercial	\$ 17,619,000	\$ 17,763,000	\$ 17,494,000
Residential	\$ 8,104,000	\$ 9,388,000	\$ 10,142,000
Income Qualified	\$ 1,188,000	\$ 1,660,000	\$ 1,637,000
Indigenous	\$ 1,029,000	\$ 1,393,000	\$ 1,515,000
Enabling Strategies	\$ 4,897,000	\$ 5,068,000	\$ 4,854,000
Overhead	\$ 1,844,000	\$ 1,841,000	\$ 2,889,000

Figure A3.5 Electric Budget Summary (pdf page 255 of 591)

	2020-21 Costs	2021-22 Costs	2022-23 Costs
Industrial	\$ 7,874,000	\$ 12,077,000	\$ 10,281,000
Custom	\$ 2,190,000	\$ 1,889,000	\$ 2,662,000
Load Displacement	\$ 984,000	\$ 5,693,000	\$ 3,357,000
New Construction & HPB	\$ 112,000	\$ 138,000	\$ 116,000
Program Support	\$ 126,000	\$ 129,000	\$ 131,000
Renovation	\$ 4,462,000	\$ 4,229,000	\$ 4,016,000
Emerging Technology	\$ -	\$ -	\$ -
Agricultural	\$ 1,990,000	\$ 1,961,000	\$ 2,170,000
Custom	\$ 418,000	\$ 360,000	\$ 508,000
New Construction & HPB	\$ -	\$ -	\$ -
Program Support	\$ 53,000	\$ 54,000	\$ 55,000
Renovation	\$ 1,459,000	\$ 1,381,000	\$ 1,311,000
Emerging Technology	\$ 60,000	\$ 165,000	\$ 296,000
Commercial	\$ 17,619,000	\$ 17,763,000	\$ 17,494,000
Custom	\$ 414,000	\$ 419,000	\$ 580,000
HVAC & Controls	\$ 1,006,000	\$ 1,083,000	\$ 1,142,000
In-Suite Efficiency	\$ 204,000	\$ 253,000	\$ 303,000
New Construction & HPB	\$ 1,404,000	\$ 1,737,000	\$ 1,551,000
Program Support	\$ 387,000	\$ 352,000	\$ 378,000
Renovation	\$ 11,504,000	\$ 11,100,000	\$ 10,635,000
Emerging Technology	\$ 63,000	\$ 121,000	\$ 143,000
Small Business & Appliance	\$ 2,636,000	\$ 2,698,000	\$ 2,763,000
Residential	\$ 8,104,000	\$ 9,388,000	\$ 10,142,000
Product Rebates	\$ 4,033,000	\$ 3,638,000	\$ 3,120,000
Program Support	\$ 623,000	\$ 656,000	\$ 673,000
New Homes & MR	\$ 913,000	\$ 1,149,000	\$ 1,168,000
Home Renovation	\$ 1,971,000	\$ 3,107,000	\$ 3,169,000
Direct Install	\$ 406,000	\$ 578,000	\$ 753,000
Home EE Kits & Education	\$ 158,000	\$ 230,000	\$ 234,000
Emerging Technology	\$ -	\$ 31,000	\$ 1,024,000
Indigenous	\$ 1,029,000	\$ 1,393,000	\$ 1,515,000
Community Geothermal	\$ 323,000	\$ 505,000	\$ 515,000
Insulation and Direct Install	\$ 196,000	\$ 256,000	\$ 272,000
Program Support	\$ 100,000	\$ 121,000	\$ 117,000
Small Business	\$ 313,000	\$ 370,000	\$ 472,000
Metis Income Qualified	\$ 97,000	\$ 141,000	\$ 140,000
Income Qualified	\$ 1,188,000	\$ 1,660,000	\$ 1,637,000
Income Qualified	\$ 1,188,000	\$ 1,660,000	\$ 1,637,000
Other Enabling Strategies	\$ 4,897,000	\$ 5,068,000	\$ 4,854,000
Other Enabling Strategies	\$ 4,897,000	\$ 5,068,000	\$ 4,854,000
Corporate Overhead	\$ 1,844,000	\$ 1,841,000	\$ 2,889,000
Corporate Overhead	\$ 1,844,000	\$ 1,841,000	\$ 2,889,000
Grand Total	\$ 44,545,000	\$ 51,151,000	\$ 50,983,000

- b. Confirmed. Figure 6.3 is inclusive of electric savings from codes and standards as shown in the corresponding table provided in MIPUG/EM I-6a.
- c. Budgets in Figure A3.5 include enabling strategies which is inclusive of codes and standards costs. Codes and standards budgets are not included within individual program bundles. A detailed breakdown of enabling strategies budget (including codes and standards is provided in COALITION/EM I-44a.
- d. Confirmed.
- e. Please see below for capacity savings by customer segment:

	2020-21 Savings (MW)	2021-22 Savings (MW)	2022-23 Savings (MW)
Industrial	25.34	26.23	25.76
Custom	2.94	1.86	3.02
Load Displacement	13.75	16.34	15.33
Renovation	8.57	7.93	7.33
New Construction & HPB	0.08	0.10	0.08
Emerging Technology	0.00	0.00	0.00
Agricultural	3.36	3.24	3.27
Custom	0.56	0.36	0.58
Renovation	2.80	2.59	2.39
New Construction & HPB	0.00	0.00	0.00
Emerging Technology	0.00	0.30	0.30
Commercial	35.20	36.98	36.99
Custom	0.45	0.32	0.50
HVAC & Controls	0.63	0.65	0.67
Renovation	21.69	20.58	19.22
New Construction & HPB	1.11	1.45	1.49
Codes & Standards	8.81	11.06	12.03
In-Suite Efficiency	0.20	0.30	0.39
Small Business & Appliance	2.32	2.37	2.42
Emerging Technology	0.00	0.26	0.26
Residential	19.97	24.47	25.17
Product Rebates	2.78	2.11	1.19
Codes & Standards	14.13	17.74	19.30
New Homes & MR	1.66	1.81	1.82
Home Renovation	1.09	2.30	2.27
Direct Install	0.29	0.42	0.51
Home EE Kits & Education	0.03	0.10	0.08
Emerging Technology	0.00	0.00	0.00
Indigenous	0.59	0.89	0.92
Community Geothermal	0.38	0.62	0.62
Insulation and Direct Install	0.06	0.13	0.14
Small Business	0.07	0.07	0.09
Metis Income Qualified	0.08	0.07	0.07
Income Qualified	0.94	0.95	0.93
Income Qualified	0.94	0.95	0.93
Grand Total	85.41	92.77	93.04

REFERENCE:

Section 6 and Section A7, Table 6.1 Electric Portfolio Summary – Composition of Annual Energy Savings & Budget by Customer Segment (pdf page 164 of 591)

PREAMBLE TO IR (IF ANY):

Table 6.1 provides a comparison of the percentage of overall annual electric savings and budget by customer segment averaged across the three years of the 3-year Plan, along with a representative percentage of total annual electric energy consumption.

QUESTION:

Please provide additional detail in respect to Table 6.1 including:

- a. Percentage of overall annual electric savings and budget by customer segment for each year of the 3-year Plan.
- b. Please clarify whether the representative percentage of total annual electric energy consumption is indicative of consumption at the meter or at generation.
- c. A reasonable breakdown for the representative percentage of the 66.1% of total 2017/18 electric energy consumption at generation shown in Table 6.1 separately for each of the industrial, commercial and agricultural segments based on the SIC code groupings used in creation of Figures A7.1, A7.2, and A7.5 (pdf pages 364, 365 and 367 of 591).
- d. Please clarify the meaning of “Deviations of this correlation are due to inclusion of existing residential and commercial codes and standards, as well as other factors such as the available energy efficiency technologies and programs, and the cost of programming” (pdf page 163, lines 65 – 67).

RATIONALE FOR QUESTION:

MIPUG is testing the reasonableness of planned savings and wants to understand the individual impacts for each of the industrial, commercial and agricultural segments which is grouped in much of EM’s plan.

RESPONSE:

- a. Please see table below for percentage of overall annual electric savings and budget by customer segment for each year of the 3-year Plan.

Customer segment/category	Savings (%) 2020/21	Budget (%) 2020/21	Savings (%) 2021/22	Budget (%) 2021/22	Savings (%) 2022/23	Budget (%) 2022/23	Savings (%) 2020-2023 Average	Budget (%) 2020-2023 Average
Industrial	39%	18%	40%	24%	39%	20%	39%	20%
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%	-	10%
Overhead	-	4%	-	4%	-	6%	-	4%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Note: May not add up due to rounding

- b. The representative percentage of total annual electric energy consumption is indicative of the consumption at the meter.

c. Please see table below for percentage of electric energy consumption by sub-sector:

Sub-Sector	<u>17/18 Electric Energy %</u>
AGRICULTURE/FOREST/FISH	5.0%
MINING	1.4%
FOOD/BEVERAGE	4.0%
PULP/PAPER	1.3%
CHEMICALS/TREATMENT	15.8%
PETROLEUM/OIL	9.6%
PRIMARY METALS	13.4%
MISCELLANEOUS INDUSTRIAL	5.1%
INDUSTRIAL NON-BUILDING	1.8%
ELECTRIC UTILITIES	0.7%
OFFICE	5.8%
RESTAURANT	1.5%
RETAIL	4.4%
GROCERY STORE	2.0%
WAREHOUSE	2.3%
SCHOOL	2.5%
COLLEGE	1.3%
HOSPITAL	2.1%
HOTEL/MOTEL	1.5%
BULK-METERED APARTMENT	4.3%
COMMON SERVICE	1.5%
PERSONAL CARE HOMES	0.8%
RECREATION FACILITY	2.6%
CHURCH	0.6%
MISCELLANEOUS COMMERCIAL	6.6%
COMMERCIAL NON-BUILDING	2.1%
TOTAL	100.0%

d. In reference to Table 6.1, the 2020/23 Efficiency Plan (“Plan”) states the following:

Energy savings projections generally correspond to the magnitude of the energy consumption or opportunity within a customer segment. Deviations of this correlation are due to inclusion of existing residential and commercial codes and standards, as well as other factors such as the available energy efficiency technologies and programs, and the cost of programming. (Plan, Section 6.1.2, p. 163 of 591, lines 63 – 67).

The first sentence refers to the general trend that energy savings and budget across customer segments groupings completed within Table 6.1 follow the 2017/18 energy consumption trends. To illustrate, commercial, agricultural and industrial energy savings, budget and 2017/18 energy consumption percentages are 77%, 60% and 66.1% respectively. These values are not expected to be aligned. The quoted section speaks to the factors which contribute to these expected deviations including the influence of codes & standards, availability and cost of energy efficiency programming within each customer segment.

REFERENCE:

Section 6 and Section A3, including:

- Figure 6.2 Natural Gas Portfolio Savings & Target Summary (pdf page 160 of 591)
- Figure A3.3 Natural Gas Savings Summary (pdf page 252 of 591)
- Figure 6.5 Natural Gas Portfolio – Annual Savings Summary (pdf page 165 of 591)
- Figure A3.4 Natural Gas Savings Summary (pdf page 253 of 591)
- Figure 6.6 Natural Gas Portfolio – Annual Budget Summary (pdf page 166 of 591)
- Figure A3.6 Natural Gas Budget Summary (pdf page 257 of 591)

PREAMBLE TO IR (IF ANY):

Figures 6.2 and A3.3 provide graphical representations of annual natural gas portfolio savings by customer segment with annual code & standards savings for all customer segments combined and shown as a separate category.

Figure 6.5 provides a graphical representation of annual natural gas portfolio savings by customer segment with combined annual interactive effects shown separately, while Figure A3.4 expands this presentation to include annual natural gas energy savings per customer segment by program bundle, including annual codes & standards savings and annual interactive effects offsets per customer segment.

Figure 6.6 provides a graphical representation of annual natural gas portfolio budget summary by customer segment, with annual budget for enabling strategies (i.e. including codes & standards) and overhead shown separately. Figure A3.6 expands this presentation to include annual natural gas budget per customer segment by program bundle, excluding annual budget for achieving codes & standards savings, but including annual budget required to achieve savings lost through interactive effects.

QUESTION:

- a. Please provide the numerical data used to create the above referenced figures in a tabular format for each year of the 3-year Plan using the customer segment and program bundle categories shown in the graphical representations.
- b. Please confirm that Figure 6.5 is inclusive of natural gas savings for codes & standards. If not confirmed, please provide an updated Figure that does include codes & standards.

- c. Please confirm that Figure A3.6 does not include budget for codes and standards savings. If not confirmed, please provide Figure A3.6 removing budget for codes & standards savings.
- d. Please confirm that Figure A3.6 is inclusive of budget required to achieve natural gas savings lost through Interactive Effects.
- e. Please confirm that no interactive effects offsets or codes & standards savings or budget are included for the industrial customer segment in Figures A3.2 and A3.6.

RATIONALE FOR QUESTION:

MIPUG is assessing the cost-effectiveness and impacts of EM's plan and requires supporting data.

RESPONSE:

- a. Please see below for the numerical data used to create the above referenced figures in a tabular format for each year of the 3-year Plan using the customer segment and program bundle categories shown in the graphical representations.

Figure 6.2 Natural Gas Portfolio Savings & Target Summary (pdf page 160 of 591)

	2020-21 Savings (million m³)	2021-22 Savings (million m³)	2022-23 Savings (million m³)
Agricultural	0.14	0.13	0.12
Commercial	0.83	1.73	1.92
Industrial	5.05	3.72	3.82
Income Qualified	1.08	1.07	1.09
Indigenous	0.03	0.06	0.06
Residential	1.04	1.97	1.86
Codes & Standards	3.51	4.09	4.36
Target	12.24	12.16	12.06

Figure A3.3 Natural Gas Savings Summary (pdf page 252 of 591)

	2020-21 Savings (million m³)	2021-22 Savings (million m³)	2022-23 Savings (million m³)
Agricultural	0.14	0.13	0.12
Commercial	0.83	1.73	1.92
Industrial	5.05	3.72	3.82
Income Qualified	1.08	1.07	1.09
Indigenous	0.03	0.06	0.06
Residential	1.04	1.97	1.86
Codes & Standards	3.51	4.09	4.36
Target	12.24	12.16	12.06

Figure 6.5 Natural Gas Portfolio – Annual Savings Summary (pdf page 165 of 591)

	2020-21 Savings (million m³)	2021-22 Savings (million m³)	2022-23 Savings (million m³)
Industrial	5.05	3.72	3.82
Agricultural	0.14	0.13	0.12
Commercial	3.13	3.80	3.78
Residential	4.37	5.84	5.98
Income Qualified	1.08	1.07	1.09
Indigenous	0.05	0.05	0.05
Interactive Effects	-2.12	-1.85	-1.62

Figure A3.4 Natural Gas Savings Summary (pdf page 253 of 591)

	2020-2021 Savings (million m³)	2021-2022 Savings (million m³)	2022-2023 Savings (million m³)
Industrial	5.05	3.72	3.82
Custom	4.89	3.53	3.64
HVAC & Controls	0.03	0.02	0.02
New Construction & HPB	0.07	0.08	0.07
Renovation	0.07	0.08	0.09
Agricultural	0.14	0.13	0.12
Custom	0.03	0.02	0.02
HVAC & Controls	0.07	0.06	0.05
New Construction & HPB	-	-	-
Renovation	0.03	0.04	0.05
Commercial	1.05	1.98	2.20
Codes & Standards	0.22	0.26	0.27
Custom	0.37	0.38	0.46
HVAC & Controls	0.69	0.67	0.65
In-Suite Efficiency	0.08	0.12	0.15
New Construction & HPB	0.54	0.88	0.64
Renovation	0.90	1.01	1.11
Small Business & Appliances	0.32	0.32	0.32
Interactive Effects	(2.08)	(1.81)	(1.58)
Emerging Technology	-	0.17	0.17
Indigenous	0.05	0.05	0.05
Metis Income Qualified	0.05	0.05	0.05
Residential	4.33	5.80	5.95
Codes & Standards	3.29	3.83	4.09
Product Rebates	0.55	0.47	0.19
Interactive Effects	(0.04)	(0.04)	(0.03)
New Homes & MR	0.07	0.16	0.17
Home Renovation	0.33	1.15	1.25
Direct Install	0.10	0.17	0.23
Home EE Kits & Education	0.03	0.06	0.06
Income Qualified	1.08	1.07	1.09
Income Qualified	1.08	1.07	1.09
Grand Total	11.70	12.75	13.23

Figure 6.6 Natural Gas Portfolio – Annual Budget Summary (pdf page 166 of 591)

	2020-21 Costs	2021-22 Costs	2022-23 Costs
Industrial	\$ 2,119,000	\$ 1,518,000	\$ 1,876,000
Agricultural	\$ 103,000	\$ 115,000	\$ 128,000
Commercial	\$ 5,299,000	\$ 5,860,000	\$ 6,010,000
Residential	\$ 2,647,000	\$ 5,155,000	\$ 5,484,000
Income Qualified	\$ 5,934,000	\$ 5,992,000	\$ 6,606,000
Indigenous	\$ 292,000	\$ 330,000	\$ 362,000
Enabling Strategies	\$ 1,632,000	\$ 1,689,000	\$ 1,618,000
Overhead	\$ 615,000	\$ 614,000	\$ 963,000

Figure A3.6 Natural Gas Budget Summary (pdf page 257 of 591)

	2020-21 Costs	2021-22 Costs	2022-23 Costs
Industrial	\$ 2,119,000	\$ 1,518,000	\$ 1,876,000
Custom	\$ 1,892,000	\$ 1,007,000	\$ 1,395,000
HVAC & Controls	\$ 12,000	\$ 12,000	\$ 13,000
New Construction & HPB	\$ 247,000	\$ 307,000	\$ 257,000
Renovation	\$ 126,000	\$ 150,000	\$ 168,000
Program Support	\$ 42,000	\$ 43,000	\$ 44,000
Agricultural	\$ 103,000	\$ 115,000	\$ 128,000
Custom	\$ 11,000	\$ 6,000	\$ 9,000
HVAC & Controls	\$ 32,000	\$ 33,000	\$ 34,000
New Construction & HPB	\$ -	\$ -	\$ -
Renovation	\$ 60,000	\$ 76,000	\$ 86,000
Program Support	\$ -	\$ -	\$ -
Commercial	\$ 5,299,000	\$ 5,860,000	\$ 6,010,000
Custom	\$ 256,000	\$ 249,000	\$ 298,000
HVAC & Controls	\$ 753,000	\$ 796,000	\$ 840,000
In-Suite Efficiency	\$ 38,000	\$ 58,000	\$ 79,000
New Construction & HPB	\$ 1,832,000	\$ 2,264,000	\$ 2,044,000
Renovation	\$ 1,916,000	\$ 1,925,000	\$ 2,134,000
Small Business & Appliances	\$ 249,000	\$ 254,000	\$ 260,000
Program Support	\$ 192,000	\$ 176,000	\$ 188,000
Emerging Technology	\$ 63,000	\$ 139,000	\$ 168,000
Residential	\$ 2,647,000	\$ 5,155,000	\$ 5,484,000
Product Rebates	\$ 890,000	\$ 813,000	\$ 272,000
Program Support	\$ 119,000	\$ 122,000	\$ 124,000
New Homes & MR	\$ 371,000	\$ 742,000	\$ 769,000
Home Renovation	\$ 933,000	\$ 3,066,000	\$ 3,839,000
Direct Install	\$ 199,000	\$ 264,000	\$ 327,000
Home EE Kits & Education	\$ 135,000	\$ 149,000	\$ 152,000
Income Qualified	\$ 5,934,000	\$ 5,992,000	\$ 6,606,000
Income Qualified	\$ 5,934,000	\$ 5,992,000	\$ 6,606,000
Metis Income Qualified	\$ 292,000	\$ 330,000	\$ 362,000
Metis Income Qualified	\$ 292,000	\$ 330,000	\$ 362,000
Other Enabling Strategies	\$ 1,632,000	\$ 1,689,000	\$ 1,618,000
Other Enabling Strategies	\$ 1,632,000	\$ 1,689,000	\$ 1,618,000
Corporate Overhead	\$ 615,000	\$ 614,000	\$ 963,000
Corporate Overhead	\$ 615,000	\$ 614,000	\$ 963,000
Grand Total	\$ 18,641,000	\$ 21,275,000	\$ 23,047,000

- b. Confirmed. Figure 6.5 is inclusive of natural gas savings from codes and standards as shown in the corresponding table provided in MIPUG/EM I-8a.

- c. Budgets in Figure A3.6 include enabling strategies which is inclusive of codes and standards costs. Codes and standards budgets are not included within individual program bundles. A detailed breakdown of enabling strategies budget (including codes and standards is provided in COALITION/EM I-44a.

- d. Confirmed.

- e. Confirmed.

REFERENCE:

Section 6 and Section A7

Table 6.2 Natural Gas Portfolio Summary – Composition of Annual Energy Savings & Budget by Customer Segment (pdf page 167 of 591)

PREAMBLE TO IR (IF ANY):

Table 6.2 provides a comparison of the percentage of overall annual natural gas savings and budget by customer segment averaged across the three years of the 3-year Plan, along with a representative percentage of total annual natural gas energy consumption.

QUESTION:

Please provide additional detail in respect to Table 6.2 including:

- a. Percentage of overall annual natural gas savings and budget by customer segment for each year of the 3-year Plan.
- b. A reasonable breakdown for the representative percentage of the 60.5% of total annual natural gas energy consumption shown in Table 6.2 separately for each of the industrial, commercial and agricultural segments based on the SIC code groupings used in creation of Figures A7.1, A7.2 and A7.5 (pdf pages 364, 365 and 367 of 591).

RATIONALE FOR QUESTION:

MIPUG is testing the reasonableness of planned savings and wants to understand the individual impacts for each of the industrial, commercial and agricultural segments which is grouped in much of EM's plan.

RESPONSE:

- a. Please see table below for percentage of overall annual natural gas savings and budget by customer segment for each year of the 3-year Plan.

Customer segment/category	Savings (%) 2020/21	Budget (%) 2020/21	Savings (%) 2021/22	Budget (%) 2021/22	Savings (%) 2022/23	Budget (%) 2022/23	Savings (%) 2020-2023 Average	Budget (%) 2020-2023 Average
Industrial	37%	11%	25%	7%	26%	8%	29%	9%
Agricultural	1%	1%	1%	1%	1%	1%	1%	1%
Commercial	23%	28%	26%	28%	25%	26%	25%	27%
Residential	32%	14%	40%	24%	40%	24%	37%	21%
Income Qualified	8%	32%	7%	28%	7%	29%	7%	30%
Indigenous	0.2%	2%	0.2%	2%	0.4%	2%	0.3%	2%
Enabling strategies	-	9%	-	8%	-	7%	-	8%
Overhead	-	3%	-	3%	-	4%	-	3%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Note: May not add up due to rounding

b. Please see table below for percentage of natural gas consumption by SIC code grouping.

Sub-Sector	<u>17/18 Natural Gas Use</u> %
AGRICULTURE/FOREST/FISH	2.4%
MINING	0.1%
FOOD/BEVERAGE	11.0%
PULP/PAPER	0.3%
CHEMICALS/TREATMENT	31.7%
PETROLEUM/OIL	0.4%
PRIMARY METALS	2.2%
MISCELLANEOUS INDUSTRIAL	6.7%
INDUSTRIAL NON-BUILDING	0.2%
OFFICE	4.0%
RESTAURANT	1.7%
RETAIL	3.7%
GROCERY STORE	1.1%
WAREHOUSE	2.5%
SCHOOL	2.6%
COLLEGE	1.6%
HOSPITAL	3.3%
HOTEL/MOTEL	1.3%
BULK-METERED APARTMENT	3.0%
COMMON SERVICE	4.8%
PERSONAL CARE HOMES	0.9%
RECREATION FACILITY	1.8%
CHURCH	0.9%
MISCELLANEOUS COMMERCIAL	11.4%
COMMERCIAL NON-BUILDING	0.5%
Total	100.0%

REFERENCE:

Section A3, including:

- Figure A3.7 Electric PACT Levelized Cost Summary – Program Bundle by Customer Segment (pdf page 261 of 591)
- Figure A3.8 Electric PACT NPV Summary – Program Bundle by Customer Segment (pdf page 262 of 591)
- Figure A3.9 Electric PACT Ratio Summary – Program Bundle by Customer Segment (pdf page 263 of 591)

PREAMBLE TO IR (IF ANY):

Figures A3.7, A3.8 and A3.9 provide graphical representations pertaining to the cost effectiveness of electric program bundles within each customer segment.

QUESTION:

- a. Please provide the numerical data used to create the above noted figures in a tabular format by the customer segment and program bundle categories shown in the graphical representations.
- b. Please provide the NPV of the total resource costs incurred to achieve electric savings, including all participant costs plus costs for EM programming (i.e. not including incentive costs), for each program in the above noted figures.
- c. Please indicate the percentage of total participant costs that will be offset by EM support and incentives for each program in the above noted figures.

RATIONALE FOR QUESTION:

MIPUG is testing the cost effectiveness of EM's 3-year plan.

RESPONSE:

- a. Please see below for the numerical data used to create the above referenced figures in a tabular format for each year of the 2020/23 Efficiency Plan using the customer segment and program bundle categories shown in the graphical representations. Revised values are highlighted.

Figure A3.7 Electric PACT Levelized Cost Summary – Program Bundle by Customer Segment (pdf page 261 of 591)

	Levelized Cost (¢/kW.h)	Portfolio Weighted Marginal Value (¢/kW.h)
Industrial		
Custom	1.15	7.33
Load Displacement	1.50	7.33
Renovation	1.66	7.33
New Construction & HPB	2.39	7.33
Emerging Technology		7.33
Agricultural		
Custom	1.15	7.33
Renovation	1.66	7.33
Emerging Technology	3.22	7.33
New Construction & HPB		7.33
Commercial		
Custom	1.33	7.33
Renovation	1.67	7.33
HVAC & Controls	2.30	7.33
New Construction & HPB	2.36	7.33
Small Business & Appliance	2.51	7.33
In-Suite Efficiency	3.14	7.33
Emerging Technology	4.20	7.33
Residential		
Emerging Technology	1.41	7.33
New Homes & MR	1.84	7.33
Home EE Kits & Education	3.05	7.33
Product Rebates	3.49	7.33
Home Renovation	3.67	7.33
Direct Install	4.15	7.33
Indigenous		
Community Geothermal	2.86	7.33
Metis Income Qualified	4.23	7.33
Insulation and Direct Install	5.88	7.33
Small Business	11.26	7.33
Income Qualified		
Income Qualified	3.70	7.33

Figure A3.8 Electric PACT NPV Summary – Program Bundle by Customer Segment (pdf page 262 of 591)

	PACT NPV Benefits	PACT NPV Costs	PACT Net NPV
Industrial			
Load Displacement	\$ 84,119,000	\$ 22,597,000	\$ 61,521,000
Renovation	\$ 59,145,000	\$ 12,025,000	\$ 47,120,000
Custom	\$ 33,630,000	\$ 6,341,000	\$ 27,290,000
New Construction & HPB	\$ 997,000	\$ 346,000	\$ 652,000
Emerging Technology	\$ -	\$ -	\$ -
Agricultural			
Renovation	\$ 19,284,000	\$ 3,928,000	\$ 15,355,000
Custom	\$ 6,412,000	\$ 1,209,000	\$ 5,203,000
Emerging Technology	\$ 2,109,000	\$ 718,000	\$ 1,390,000
New Construction & HPB	\$ -	\$ -	\$ -
Commercial			
Renovation	\$ 156,922,000	\$ 31,441,000	\$ 125,481,000
Small Business & Appliance	\$ 17,585,000	\$ 7,641,000	\$ 9,945,000
New Construction & HPB	\$ 13,082,000	\$ 4,423,000	\$ 8,660,000
HVAC & Controls	\$ 8,545,000	\$ 3,044,000	\$ 5,501,000
Custom	\$ 5,965,000	\$ 1,325,000	\$ 4,640,000
In-Suite Efficiency	\$ 1,768,000	\$ 712,000	\$ 1,055,000
Emerging Technology	\$ 1,503,000	\$ 456,000	\$ 1,047,000
Residential			
Home Renovation	\$ 22,428,000	\$ 7,723,000	\$ 14,705,000
New Homes & MR	\$ 19,922,000	\$ 3,036,000	\$ 16,885,000
Product Rebates	\$ 17,776,000	\$ 10,242,000	\$ 7,533,000
Emerging Technology	\$ 2,660,000	\$ 941,000	\$ 1,719,000
Direct Install	\$ 2,482,000	\$ 1,622,000	\$ 861,000
Home EE Kits & Education	\$ 936,000	\$ 583,000	\$ 353,000
Indigenous			
Community Geothermal	\$ 5,075,000	\$ 1,259,000	\$ 3,816,000
Insulation and Direct Install	\$ 1,293,000	\$ 680,000	\$ 613,000
Metis Income Qualified	\$ 913,000	\$ 354,000	\$ 559,000
Small Business	\$ 620,000	\$ 1,081,000	-\$ 461,000
Income Qualified			
Income Qualified	\$ 11,786,000	\$ 4,210,000	\$ 7,576,000

Figure A3.9 Electric PACT Ratio Summary – Program Bundle by Customer Segment (pdf page 263 of 591)

PACT RATIO	
Industrial	
New Construction & HPB	2.88
Load Displacement	3.72
Renovation	4.92
Custom	5.30
Emerging Technology	
Agricultural	
Emerging Technology	2.94
Renovation	4.91
Custom	5.30
New Construction & HPB	
Commercial	
Small Business & Appliance	2.30
In-Suite Efficiency	2.48
HVAC & Controls	2.81
New Construction & HPB	2.96
Emerging Technology	3.30
Custom	4.50
Renovation	4.99
Residential	
Direct Install	1.53
Home EE Kits & Education	1.61
Product Rebates	1.74
Emerging Technology	2.83
Home Renovation	2.90
New Homes & MR	6.56
Indigenous	
Small Business	0.57
Insulation and Direct Install	1.90
Metis Income Qualified	2.58
Community Geothermal	4.03
Income Qualified	
Income Qualified	2.80

- b. Please see response to PUB/EM I-11.
- c. Please column L in the table attached to DAYMARK/EM I – 13d for the percentage of incremental cost that the financial incentive is expected to cover.

REFERENCE:

Section A3 including:

- Figure A3.10 Natural Gas PACT Levelized Cost Summary – Program Bundle by Customer Segment (pdf page 265 of 591)
- Figure A3.11 Natural Gas PACT NPV Summary – Program Bundle by Customer Segment (pdf page 267 of 591)
- Figure A3.12 Natural Gas PACT Ratio Summary – Program Bundle by Customer Segment (pdf page 268 of 591)

PREAMBLE TO IR (IF ANY):

Figures A3.10, A3.11 and A3.12 provide graphical representations pertaining to the cost effectiveness of electric program bundles within each customer segment.

QUESTION:

- a. Please provide the numerical data used to create the above referenced figures in a tabular format for using the customer segment and program bundle categories shown in the graphical representations.
- b. Please confirm whether the total resource costs provided in (a) above, includes the costs in achieving natural gas savings lost to interactive effects from electric programming.
- c. Please provide the NPV of the total resource costs for achieving natural gas savings, including all participant costs plus costs for EM programming (i.e. not including incentive costs), for each program in the above referenced figures.
- d. Please indicate the percentage of total participant costs that will be offset by EM support and incentives for each program in the above referenced figures.

RATIONALE FOR QUESTION:

MIPUG is testing the cost effectiveness of EM's 3-year plan

RESPONSE:

- a. Please see below for the numerical data used to create the above referenced figures in a tabular format for each year of the 3-year Plan using the customer segment and program bundle categories shown in the graphical representations.

Figure A3.10 Natural Gas PACT Levelized Cost Summary – Program Bundle by Customer Segment (pdf page 265 of 591)

	Levelized Cost (¢/m ³)	Portfolio Weighted Marginal Value (¢/m ³)
Industrial		
Custom	2.53	18.45
HVAC & Controls	3.29	18.45
Renovation	10.98	18.45
New Construction & HPB	31.46	18.45
Agricultural		
Custom	2.53	18.45
HVAC & Controls	3.29	18.45
Renovation	10.64	18.45
New Construction & HPB		18.45
Commercial		
Custom	4.43	18.45
In-Suite Efficiency	5.68	18.45
HVAC & Controls	7.91	18.45
Small Business & Appliances	10.06	18.45
Renovation	11.97	18.45
Emerging Technology	21.40	18.45
New Construction & HPB	30.52	18.45
Indigenous		
Metis Income Qualified	44.94	18.45
Residential		
Home Renovation	16.82	18.45
Residential	19.49	18.45
Product Rebates	22.68	18.45
Direct Install	23.19	18.45
New Homes & MR	28.07	18.45
Income Qualified		
Income Qualified	40.29	18.45

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Figure A3.11 Natural Gas PACT NPV Summary – Program Bundle by Customer Segment
(pdf page 267 of 591)

	PACT (NG) NPV Benefits	PACT (NG) NPV Costs	PACT (NG) Net NPV
Industrial			
Custom	\$ 27,013,000	\$ 3,884,000	\$ 23,129,000
Renovation	\$ 721,000	\$ 416,000	\$ 305,000
HVAC & Controls	\$ 203,000	\$ 35,000	\$ 168,000
New Construction & HPB	\$ 444,000	\$ 765,000	-\$ 322,000
Agricultural			
HVAC & Controls	\$ 544,000	\$ 93,000	\$ 451,000
Renovation	\$ 372,000	\$ 208,000	\$ 164,000
Custom	\$ 171,000	\$ 25,000	\$ 147,000
New Construction & HPB	\$ -	\$ -	\$ -
Commercial			
Renovation	\$ 8,937,000	\$ 5,631,000	\$ 3,306,000
HVAC & Controls	\$ 5,405,000	\$ 2,252,000	\$ 3,154,000
Custom	\$ 3,164,000	\$ 756,000	\$ 2,408,000
Small Business & Appliances	\$ 1,261,000	\$ 720,000	\$ 541,000
In-Suite Efficiency	\$ 514,000	\$ 163,000	\$ 351,000
Emerging Technology	\$ 844,000	\$ 948,000	-\$ 104,000
New Construction & HPB	\$ 3,415,000	\$ 5,786,000	-\$ 2,371,000
Indigenous			
Metis Income Qualified	\$ 406,000	\$ 925,000	-\$ 519,000
Residential			
Home Renovation	\$ 8,723,000	\$ 7,242,000	\$ 1,482,000
Direct Install	\$ 573,000	\$ 739,000	-\$ 166,000
Home EE Kits & Education	\$ 168,000	\$ 411,000	-\$ 243,000
Product Rebates	\$ 1,497,000	\$ 1,899,000	-\$ 402,000
New Homes & MR	\$ 1,264,000	\$ 1,756,000	-\$ 492,000
Income Qualified			
Income Qualified	\$ 8,578,000	\$ 17,465,000	-\$ 8,888,000

Figure A3.12 Natural Gas PACT Ratio Summary – Program Bundle by Customer Segment
(pdf page 268 of 591)

PACT (NG) RATIO	
Industrial	
New Construction & HPB	0.58
Renovation	1.73
HVAC & Controls	5.84
Custom	6.96
Agricultural	
Renovation	1.79
HVAC & Controls	5.84
Custom	6.96
Commercial	
New Construction & HPB	0.59
Emerging Technology	0.89
Renovation	1.59
Small Business & Appliances	1.75
HVAC & Controls	2.40
In-Suite Efficiency	3.15
Custom	4.19
Indigenous	
Metis Income Qualified	0.44
Residential	
Home EE Kits & Education	0.41
New Homes & MR	0.72
Direct Install	0.78
Product Rebates	0.79
Home Renovation	1.20
Income Qualified	
Income Qualified	0.49

- b. Not confirmed. As discussed in Section 5.1.2 (2020/23 Efficiency Plan, p. 129 – 130 of 591, lines 49 – 62), all interactive effects for the PACT are considered at the portfolio level. This is also shown in the 2020/23 Efficiency Plan, Attachment 3, p. 511 of 591, where interactive effects from electric programming are accounted for in the natural gas cost-effectiveness test at the portfolio level.
- c. Please see response to PUB/EM I-11.
- d. Please column L in see the table attached to DAYMARK/EM I – 13d for the percentage of incremental cost that the financial incentive is expected to cover.

REFERENCE:

Section A7, including:

- Figure A7.1 Manitoba Commercial Market (pdf page 364 of 591)
- Figure A7.2 Manitoba Industrial Market (pdf page 365 of 591)
- Figure A7.3 Manitoba Industrial Market – Average Electricity Use per Customer (pdf page 366 of 591)
- Figure A7.4 Manitoba Industrial Market – Average Natural Gas Use per Customer (pdf page 366 of 591)
- Figure A7.5 Manitoba Agricultural Market (pdf page 367 of 591)
- Figure A7.6 Manitoba Agricultural Market – Average Electricity Use per Customer (pdf page 368 of 591)

PREAMBLE TO IR (IF ANY):

Figures A7.1 through A7.6 provide information regarding the composition and consumption characteristics of the Manitoba commercial, industrial and agricultural customer segments.

QUESTION:

- a. Please provide data in a similar format to that provided regarding the industrial customer segment in Figures A7.3 and A7.4 for the commercial customer segment, including average electricity and natural gas use per customer.
- b. Please provide data in a similar format to that provided regarding the industrial customer segment in Figure A7.4 for the agricultural customer segment.
- c. Please confirm that the average electricity and natural gas use referenced in Figures A7.3 and A7.4 respectively is for all customers within the SIC grouping.
- d. If available, please provide an estimate of propane, fuel oil and other fossil fuel consumption within the commercial, industrial and agricultural sector.

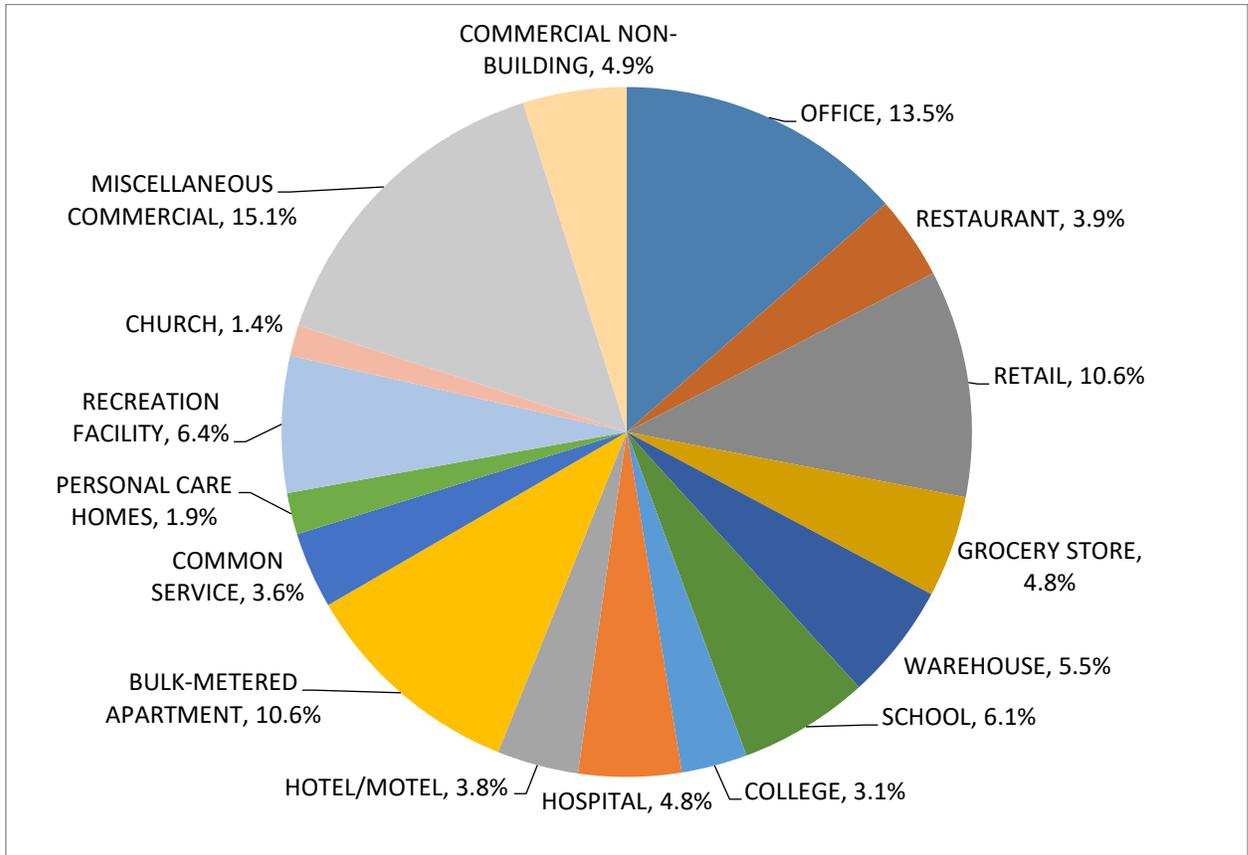
RATIONALE FOR QUESTION:

MIPUG is testing the reasonableness of EM's plan for commercial and industrial customers.

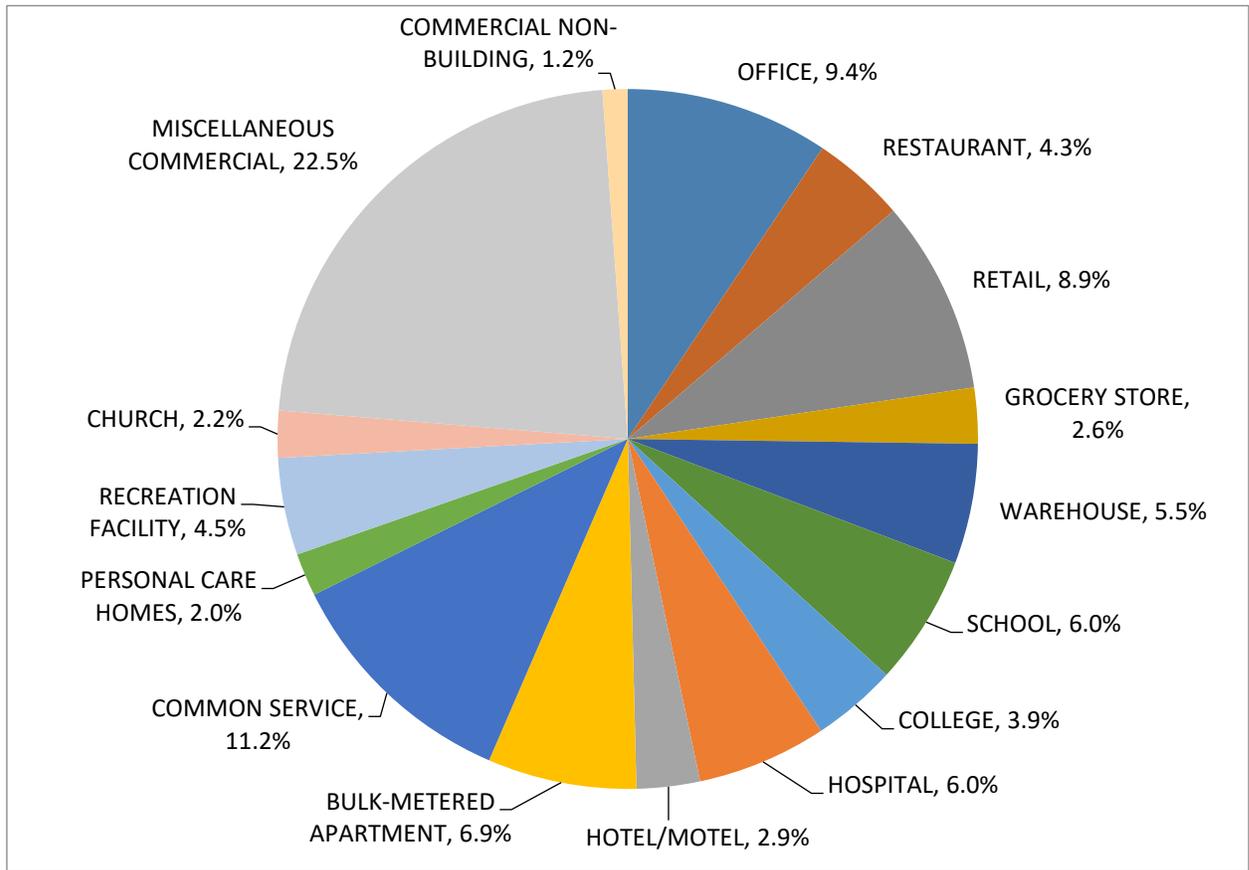
RESPONSE:

- a. Please see charts below for detail of the commercial customer segment, including average electricity and natural gas use per customer:

Manitoba Commercial Market – Electric Use per Customer Sector



Manitoba Commercial Market –Natural Gas Use per Customer Sector



- b. The information requested has been provided in Figure A7.7 Manitoba Agriculture Market Average Natural Gas Use per Customer on PDF page 369 of 591.
- c. Confirmed, the average electricity and natural gas use referenced in Figures A7.3 and A7.4 respectively is for all customers within the SIC grouping.
- d. Efficiency Manitoba does not possess estimates of consumption in propane and fuel oil for the commercial, industrial nor agricultural sectors.

REFERENCE:

Attachment 3, including:

- Annual Electric Energy Savings (pdf page 513 of 591)
- Annual Electric Capacity Savings (pdf page 514 of 591)
- Annual Electric Costs (pdf page 515 of 591)
- Annual Natural Gas Savings (pdf page 507 of 591)
- Annual Natural Gas Costs (pdf page 508 of 591)

PREAMBLE TO IR (IF ANY):

The measures identified in the tables noted above have benefits that extend beyond the period defined by the 3-year Plan. Factors impacting the duration of these benefits include, useful life, persistence of use, etc.

QUESTION:

- a. Please provide the annual and cumulative energy (i.e. electric and natural gas) and capacity (i.e electric only) savings, along with annual and cumulative costs incurred by EM for each year of the 30-year period used for evaluating the cost effectiveness of programs identified for the commercial, industrial and agricultural customer segments.
- b. If available, please provide the requested savings and cost streams separately for the commercial, industrial and agricultural customer segments.

RATIONALE FOR QUESTION:

MIPUG is assessing the inputs for EM's planned savings and costs. MIPUG notes that Daymark (the PUB's independent advisor) has asked quite a few IRs related to this topic in its review to avoid duplication but is unsure the extent that responses to those IRs may be confidentially provided.

RESPONSE:

- a. Efficiency Manitoba has provided the corresponding electronic workpapers to Daymark based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark.

- b. Efficiency Manitoba has provided the corresponding electronic workpapers to Daymark based on the Non-Disclosure Agreement executed between Efficiency Manitoba and Daymark.

REFERENCE:

Section A8

PREAMBLE TO IR (IF ANY):

Section A8 identifies plans for two emerging technology programs, biomass heating and solar photovoltaics commencing in 2021/22 and 2022/23 respectively. Table A8.1 (pdf page 406 of 591) identifies both programs as new offerings.

QUESTION:

- a. Please provide an overview of the methodology for identification and determination EM undertook of emerging technologies for inclusion in the 3-year Plan and longer-term. Please specifically explain:
 - i. Identifying emerging technologies for the industrial sector and framework for determining whether or not to incorporate these technologies and the timing for incorporation.
 - ii. How Efficiency Manitoba will explore potential additions to the emerging technologies portfolio and accommodate and prioritize additional emerging technology program offerings for the industrial sector during the term of the 3-year Plan. If not included in the 3-Year plan, please explain how EM is considering emerging technologies for longer-term inclusion.
 - iii. Whether Efficiency Manitoba has considered an Emerging Technologies Pilot Program offering where industrial customers could explore energy-saving emerging technologies relevant to their needs.
- b. Please explain how the Solar Energy Program and Customer Sited Bioenergy Program differ from prior programs offered by Manitoba Hydro and how these programs qualify as new program offerings, including:
 - i. An explanation as to whether the use of bioenergy for industrial processes is facilitated under the 3-year Plan.
- c. Other emerging technologies examined by Efficiency Manitoba that were not included in the 3-year Plan, including:

- i. Emerging technologies of potential interest to industrial customers,
- ii. Rationale for excluding these emerging technologies from the 3-year Plan.
- iii. Results of cost-effectiveness tests undertaken when evaluating these technologies for inclusion in the 3-year Plan.

RATIONALE FOR QUESTION:

MIPUG seeks to understand the assessment process and framework for identification of emerging technologies and other efficiency considerations within its plan.

RESPONSE:

a) See responses as follows:

- i. Efficiency Manitoba has identified emerging technologies that are either being utilized or under development in other jurisdictions. The list was then pre-screened to determine applicability to the Manitoba market and specific industrial sectors. See PUB/EM – 1a for additional information on pre-screening qualifications.
- ii. Efficiency Manitoba will continuously research, review and assess emerging technologies to ensure that the opportunity is identified well in advance in order to assist with time that is typically required to move new emerging technologies through the product adoption life cycle. Efficiency Manitoba will vet emerging technologies through research, pilot projects and consulting with industry. Efficiency Manitoba will capture any opportunities on a case-by-case basis within the Custom program bundle and pursue as a pilot project until such time a prescriptive technology incentive is developed and deployed. If something of interest to both the industrial segment and Efficiency Manitoba materializes within the 3 years of the current plan, the contingency fund can be justified for use due to the energy savings resulting from the opportunity.
- iii. As per the 2020/23 Efficiency Plan, Section 7.4, Efficiency Manitoba will capture emerging opportunities through a variety of channels, and may use the innovation budget for support. All customers are welcome to bring potential/emerging energy savings opportunities to Efficiency Manitoba. These opportunities could be treated as projects under the custom measures offering and may be candidates for pilot

projects. Efficiency Manitoba understands that industrial customers have unique processes and will continue to consult with industrial customers regarding specific energy saving opportunities that meet their business needs.

- b) Efficiency Manitoba's Solar Energy Program will differ from the Manitoba Hydro pilot program. Efficiency Manitoba will be reviewing the data and feedback obtained from Manitoba Hydro's pilot program and will be confirming the characteristics of the new program for year 3 of the Plan. The Manitoba Hydro Bioenergy Optimization Program targeted the application of waste streams and by-products into fuel that produces useful heat and power. There continues to be both technical and economic challenges to produce both heat and power from waste streams. The Efficiency Manitoba Customer Sited Bioenergy program has elected to focus on the application of wood pellet and wood chip systems to provide space and/or process heating to grid-connected participants. The Efficiency Manitoba Customer Sited Bioenergy program will be available to all market sectors, including Industrial customers. Industrial participants are expected to use biomass to offset a heating load presently provided by electricity or natural gas. Initial analysis has identified the target market as rural electrically heated schools, agricultural facilities and municipal buildings. The Customer Sited Bioenergy program has allocated financial support for 9 projects in each of Year's 2 – 2021/22 and Year 3 – 2022/23, split 3 each for agricultural facilities and 6 each for schools and municipal buildings.
- c) For response to i through iii, please see response to PUB/EM I-1a. In addition to the emerging technologies identified through pre-screening, Efficiency Manitoba will also review projects under the Custom offerings for opportunities to move to a pilot project or emerging technology offering.

REFERENCE:

Determination of Levelized Marginal Values using PACT Ratio and Levelized Costs, pdf page 134

PREAMBLE TO IR (IF ANY):

For comparison purposes, a representative portfolio weighted electric marginal value, determined by multiplying the PACT ratio by the levelized cost, is 7.33¢/kWh.

QUESTION:

- a. Please describe in detail, the methodology used for developing the reference marginal values used for assessing the benefits for industrial programs.
- b. Please confirm the format in which Manitoba Hydro provides marginal values for:
 - i. Generation (capacity, energy, on-peak, off-peak, seasonal).
 - ii. Transmission (capacity, energy, on-peak, off-peak, seasonal).
 - iii. Distribution (capacity, energy, on-peak, off-peak, seasonal).
- c. Please explain how capacity and energy savings for a measure, bundle or portfolio are categorized as occurring in the:
 - i. On-peak and off-peak periods.
 - ii. Summer, winter and/or shoulder seasons.
 - iii. Adjustments used to convert savings at the meter to savings at generation.
- d. Please explain how the load profile or shape of the savings achieved by a measure, bundle or portfolio used to determine marginal value benefits.

RATIONALE FOR QUESTION:

MIPUG seeks to understand how savings load profiles are developed and applied to the marginal values provided by Manitoba Hydro for the purpose of determining marginal benefits.

RESPONSE:

- a) The determination of the marginal values is done independently by Manitoba Hydro, and Efficiency Manitoba accepts and applies the values as received. With respect to the application of these marginal values, for industrial customers that receive transmission level electrical services, Efficiency Manitoba excludes the distribution component of the marginal values received.
- b) Please see the response to DAYMARK/EM I – 20a.
- c)
 - i. Please see the response to DAYMARK/EM I – 21.
 - ii. Please see the response to DAYMARK/EM I – 21.
 - iii. Page 20 of 88 of the Manitoba Hydro 2018 Electric Load Forecast provides the adjustments used to convert savings at the meter to savings at generation. For convenience that excerpt is included below:
“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.”
Please see the response to COALITION/EM I – 1a for links to the 2018 Manitoba Hydro Load Forecast.
- d) Please see the response to DAYMARK/EM I – 20 a and DAYMARK/EM I – 21.

REFERENCE:

Changes in Marginal Values

PREAMBLE TO IR (IF ANY):

Marginal values are influenced by the cost of alternative resources, opportunities for energy sales into other markets, costs for transmission and distribution infrastructure required to meet growing energy demands, along with other factors related to those costs and opportunities. These factors change over time, in response to changes in forecasted consumption, increasing or declining costs for alternative resources and infrastructure and the demand for energy in opportunity markets.

QUESTION:

Please provide an overview of the directional change in the marginal value obtained for capacity and energy savings projected under the Plan since the last Power Smart Plan provided by Manitoba Hydro, including:

- a. Marginal value and timing for on-peak capacity savings.
- b. Marginal value and timing for seasonal energy savings.
- c. Marginal value and timing for on-peak energy savings.
- d. Marginal value and timing of off-peak energy savings.
- e. Marginal value and timing for transmission infrastructure savings.
- f. Marginal value and timing for distribution infrastructure savings.
- g. Key factors or changes in load forecasts, infrastructure costs, resource availability and/or energy markets that have impacted marginal valuations.

RATIONALE FOR QUESTION:

MIPUG seeks to understand how marginal values provided by Manitoba Hydro have evolved since the last review of a DSM plan by the Public Utilities Board.

RESPONSE:

Response to parts a-g:

This information is not within the knowledge of Efficiency Manitoba.

REFERENCE:

Attachment 3, Electric Program Cost-Effectiveness Metrics, pdf page 516

PREAMBLE TO IR (IF ANY):

The levelized cost for program bundles identified in the Electric Program Cost-Effectiveness Metrics table (pdf page 516) of Attachment 3 appear to be determined using the NPV of EM costs for achieving savings over the 30-year assessment period divided by the NPV of energy savings at generation over the same period. Multiplying the PACT ratio for a program bundle by the levelized cost for that bundle would appear to provide a representative levelized marginal value based on the NPV of energy saved at generation.

QUESTION:

- a. When establishing the levelized marginal value specific to a measure, program, bundle or portfolio, does Efficiency Manitoba reference the levelized marginal value at the meter or at generation in its decision-making criteria? Please explain the approach.
- b. Please confirm that the levelized costs shown in the Electric Program Cost-Effectiveness Metrics table (pdf page 516) are based on the NPV of EM costs (i.e. incentives and programming) divided by the NPV of energy saved at generation over the 30-year test period.
 - i. Are the levelized costs and NPV benefits shown in the tables in Attachment 3 in Real or Nominal dollars?
 - ii. Is a real or nominal discount rate applied for determining NPV over the 30-year test period?
 - iii. Please expand Electric Program Cost-Effectiveness Metrics table (pdf page 516) to include NPV energy saved (GW.h), NPV savings (\$) and NPV costs (\$).
- c. Please indicate whether Manitoba Hydro intends for its marginal values to be applied based on savings at the meter or at generation.
 - i. How are the marginal values provided by Manitoba Hydro adjusted for determining the value of capacity and energy savings provided at the meter vs. at generation, or vice-versa depending on the response to b)?

RATIONALE FOR QUESTION:

MIPUG is seeking clarification as to how the Application represents costs and benefits, and whether the levelized marginal value obtained when multiplying the levelized cost by the PACT ratio is consistent with how Manitoba Hydro intends for its marginal values to be applied.

RESPONSE:

- a. Both the weighted marginal values and the program administrator cost test (PACT) levelized cost values provided within the 2020/23 Efficiency Plan (“Plan”) are determined based on levelized energy values at generation.
- b. Confirmed
 - i. All present values are calculations are done over a 30-year period and are discounted back to 2020 real values.
 - ii. The Plan uses nominal dollars throughout the 30-year test period, therefore the nominal discount rate provided in Table A2.3 (Plan, Appendix A2, p. 232 of 591) was applied for determining the NPV.
 - iii. Please see PUB/EM I-11.
- c. The determination of the marginal values is done independently by Manitoba Hydro, and Efficiency Manitoba accepts and independently applies the values.
 - i. Efficiency Manitoba applies the marginal values provided by Manitoba Hydro to determine the PACT benefits in dollars based on energy savings at meter and marginal values at meter for consistency purposes.

REFERENCE:

Forecast Program Savings and Benefits

PREAMBLE TO IR (IF ANY):

in the 2017/18 and 2018/19 GRA, in response to PUB-MFR-77, Manitoba Hydro forecast the cost/revenue impacts under different scenarios of forecast energy savings on retained earnings. The table provided is included for reference:

Figure 1. Incremental Increase/Decrease in Retained Earnings

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

QUESTION:

- a. Please explain any assessment that EM has taken on the sensitivity of its cost-effectiveness and the amount of actual savings achieved over the 3-year test period. Please provide any and all analysis undertaken in this regard.
- b. If EM has not undertaken sensitivity analysis in this regard, please explain why not.
- c. Please provide a sensitivity, similar to the above proposed on portfolio metrics if 100% investment results in only 50% expected savings.

RATIONALE FOR QUESTION:

MIPUG wants to understand the impacts of EM's plan and sensitivity to program uptake on cost effectiveness, including what if any analysis EM has taken in this regard.

RESPONSE:

- a) Section 7 of the 2020/23 Efficiency Plan discusses the approach Efficiency Manitoba proposes for monitoring, evaluating and continuously improving performance.

The 2020/23 Efficiency Plan (the "Plan") positions Efficiency Manitoba on a trajectory for long-term attainment of the cumulative electric and natural gas energy savings targets directed within the Efficiency Manitoba Act (the "Act"). The approach adopted within the Plan is based on thorough analysis and reasonable projections; however, Efficiency Manitoba recognizes the benefits of incorporating flexibility to maintain responsiveness to opportunities throughout the Plan time-horizon.

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.

Provided the above flexibilities, Efficiency Manitoba has not completed any specific sensitivity assessment of scenarios where actual evaluated energy savings or budgets are 50% or 100% less than proposed within the Plan.

- b) Please see MIPUG/EM I-18a.

- c) This Information Request requires analysis that is not available and cannot be answered by Efficiency Manitoba with reasonable effort in the time permitted.