

Index – MIPUG Book of Documents
2014/15 and 2015/16 Manitoba Hydro GRA
As of June 8, 2015

Tab	Description	Reference
Manitoba Hydro Load, DSM & Rates Panel		
1	A) Excerpts Power Smart Plan 2014 – 2017	A) Appendix 8.1, page 42, Appendix A.1, and Appendix B.1
2	A) Calculative Example of DSM vs. New Supply B) DSM framework IR with Theoretical Example on assessing program fairness	A) MIPUG-20-3 (MIPUG Book of Documents Volume – 3) from NFAT hearing re: PUB/MH I-216b example B) PUB/MH I-216b from NFAT hearing

TAB 1

Power Smart Plan

2014 to 2017

SUPPLEMENTAL REPORT: 15yr (2014 to 2029)



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Tab 1

2.3.2 Utility Perspective

Metrics

The following table outlines the cost effectiveness, from a utility perspective, of the program offerings provided in the 2014-2017 Power Smart Plan - 15 year supplemental report.

Utility DSM Metrics 2014/15 - 2028/29									
	Electric DSM				Natural Gas DSM				
	RIM	NUB	NPV	LUC (€/kWh)	RIM	NUB	NPV	LUC (€/m ³)	
Residential									
New Home Program	1.1	5.1	\$7.3	0.3	0.8	(110.8)	(\$7.7)	0.1	c
Home Insulation Program	1.2	1.6	\$8.0	3.2	0.6	(0.6)	(\$18.4)	12.6	
Water and Energy Saver Program	0.7	0.0	(\$4.2)	3.0	0.5	(0.6)	(\$4.9)	12.7	
Affordable Energy Program									
Affordable Energy Program - Insulation	1.1	1.4	\$4.9	3.4	0.3	(0.2)	(\$31.7)	41.7	**
Affordable Energy Program - Furnace	n/a	n/a	n/a	n/a	0.2	(0.1)	(\$17.3)	119.9	**
Affordable Energy Program - Total	1.1	1.4	\$4.9	3.4	0.3	(0.1)	(\$48.9)	55.3	**
Refrigerator Retirement Program	0.6	(0.7)	(\$10.8)	2.3	0.8	0.0	\$1.4	-	i
Residential LED Lighting Program	0.8	0.3	(\$1.2)	2.4	0.8	0.0	\$0.5	0.0	i
Community Geothermal Program	0.9	0.5	(\$7.7)	2.5	0.0	0.0	\$0.0	0.0	
Residential Programs Total	1.0	0.9	(\$3.8)	2.2	0.5	(0.4)	(\$78.1)	20.9	
Commercial									
Commercial Lighting Program	0.9	0.7	(\$22.3)	2.4	0.8	0.0	\$1.2	0.0	i
LED Roadway Lighting Conversion Program	0.8	0.8	(\$6.9)	3.3	n/a	n/a	n/a	n/a	
Commercial Building Envelope - Windows Program	1.2	1.7	\$6.0	2.5	0.6	(0.3)	(\$6.5)	12.4	
Commercial Building Envelope - Insulation Program	1.2	1.6	\$5.0	2.8	0.6	(0.3)	(\$19.5)	12.3	
Commercial Geothermal Program	1.0	0.9	(\$4.1)	3.2	n/a	n/a	n/a	n/a	
Commercial HVAC Program - Boilers	-	-	-	-	0.8	(0.8)	(\$4.2)	4.5	c
Commercial HVAC Program - Chillers	0.7	(0.7)	(\$2.9)	1.4	n/a	n/a	n/a	n/a	
Commercial HVAC Program - CO2 Sensors	1.7	3.5	\$0.9	2.6	0.7	(0.5)	(\$2.2)	7.3	
Commercial HVAC Program - Water Heaters	n/a	n/a	n/a	n/a	0.6	(0.4)	(\$0.9)	11.6	
Commercial Custom Measures Program	1.1	1.2	\$1.4	3.2	0.6	(0.3)	(\$2.8)	12.1	
Commercial Building Optimization Program	0.9	0.6	(\$1.1)	2.8	0.6	(0.3)	(\$3.8)	13.0	
New Buildings Program	1.4	3.0	\$28.6	1.7	0.6	(0.2)	(\$3.9)	13.5	
Commercial Refrigeration Program	0.9	0.6	(\$2.5)	1.1	0.8	0.0	\$0.6	-	i
Commercial Kitchen Appliance Program	1.7	13.1	\$2.6	0.7	0.7	(1.5)	(\$1.1)	3.7	
Network Energy Management Program	1.1	2.3	\$0.8	0.9	0.9	0.0	\$0.0	-	i
Internal Retrofit Program	1.2	1.2	\$0.4	5.4	1.9	1.9	(\$0.1)	13.0	
Power Smart Shops	0.9	0.6	(\$0.5)	2.7	0.6	(0.7)	(\$0.1)	10.5	
Commercial Programs Total	1.0	1.0	\$5.3	2.4	0.6	(0.4)	(\$44.6)	10.8	
Industrial									
Performance Optimization Program	0.9	0.8	(\$19.3)	2.6	n/a	n/a	n/a	n/a	
Natural Gas Optimization Program	n/a	n/a	n/a	n/a	0.8	(0.5)	(\$3.2)	4.6	
Industrial Programs Total	0.9	0.8	(\$19.3)	2.6	0.8	(0.5)	(\$3.2)	4.6	
Energy Efficiency Subtotal	1.0	0.9	(\$17.8)	2.4	0.6	(0.4)	(\$125.8)	14.8	
Load Management									
Curtailable Rate Program	1.4	1.4	\$32.2	n/a	n/a	n/a	n/a	n/a	
Load Management Programs Total	1.4	1.4	\$32.2	n/a	n/a	n/a	n/a	n/a	
Load Displacement & Alternative Energy									
Bioenergy Optimization Program	1.0	1.1	\$1.2	1.4	0.8	(0.4)	(\$1.1)	4.2	
Customer Sited Load Displacement	1.2	2.0	\$74.3	1.0	n/a	n/a	n/a	n/a	
Load Displacement & Alt. Energy Programs Total	1.1	1.9	\$75.4	1.0	0.8	(0.4)	(\$1.1)	4.2	
Conservation Rates									
Conservation Rates - Residential	0.8	(1.8)	(\$35.3)	0.8	n/a	n/a	n/a	n/a	
Conservation Rates - Commercial	1.1	2.3	\$18.4	0.6	n/a	n/a	n/a	n/a	
Conservation Rates Total	0.9	0.4	(\$17.0)	0.7	n/a	n/a	n/a	n/a	
Fuel Choice									
Fuel Choice	1.0	1.0	\$1.2	1.3	0.0	0.0	\$0.0	0.0	
Fuel Choice Total	1.0	1.0	\$1.2	1.3	0.0	0.0	\$0.0	0.0	
Program Impacts Total	1.0	1.1	\$74.1	1.6	0.6	(0.4)	(\$126.9)	14.5	
Program Support and Contingency Costs	-	-	(\$59.9)	-	-	-	(\$25.4)	-	
Program Impacts Total (Incl. Support and Contingency Costs)	1.0	1.0	\$14.3	1.8	0.5	(0.3)	(\$152.3)	18.5	
Other Internal DSM Investments									
Affordable Energy Fund	-	-	(\$0.9)	-	-	-	(\$0.7)	-	
Overall Portfolio Metric	1.0	1.0	\$13.3	1.8	0.5	(0.3)	(\$153.0)	18.6	13.5 (4)

Notes:

** Includes all Affordable Energy Fund Expenditures and Furnace Replacement Program

AEF Electric - Total:

Excluding AEF costs, RIM is 1.4, NUB is 3.8, NPV is \$12.8M, and LUC is 1.3 €/kWh

AEF Natural Gas - Total:

Excluding AEF costs, without Furnace Replacement Program, RIM is 0.6, NUB is -1.1, NPV is -\$9.3M, and LUC is 6.8 €/m³

c Program assumption includes savings from Codes & Standards

i Program reflects natural gas interactive effects

1) Overall RIM, NUB, and NPV portfolio metrics include Curtailable Rate Program and do not include Customer Service Initiatives / Financial Loan Programs

2) Overall LUC portfolio metric does not include Curtailable Rate Program

3) Overall portfolio metrics include all support, contingency and Affordable Energy Fund Expenditures and Furnace Replacement Program

4) Excluding the Affordable Energy Program, overall natural gas LUC is 13.5 €/m³

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2014 - 2017 Power Smart Plan
Annual Capacity Savings (MW)

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	MW at Generation 2028/29	
RESIDENTIAL																	
Incentive Based																	
New Home Program	0.0	0.0	0.0	0.3	1.0	2.2	4.3	5.4	6.4	7.3	8.3	9.2	10.2	11.1	12.0	13.7	
Home Insulation Program	2.6	4.8	6.9	8.7	10.3	11.7	12.9	13.9	14.8	15.5	16.0	16.5	16.8	16.8	16.8	19.1	
Water and Energy Saver Program	0.6	1.2	1.7	1.9	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.8	
Affordable Energy Program	1.8	3.6	5.3	7.0	8.6	10.2	11.8	13.1	14.3	15.4	16.3	16.5	16.6	16.1	15.6	17.8	
Refrigerator Retirement Program	1.2	2.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.5	1.5	0.7	0.4	0.2	0.2	
Residential LED Lighting Program	0.5	0.6	0.9	1.2	1.6	1.7	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.6	
Community Geothermal Program	1.1	2.6	4.4	7.0	9.1	10.9	12.1	13.3	14.5	15.7	15.7	15.7	15.7	15.7	15.7	17.9	
Subtotal	7.8	15.3	22.7	29.6	36.2	42.6	48.7	53.0	57.3	61.3	62.7	63.3	63.8	64.0	64.1	73.1	10%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart Residential Loan	0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	2.6	2.9	3.1	3.4	3.7	3.9	4.5	
Power Smart PAYS Financing	0.1	0.2	0.3	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.4	1.6	
Residential Earth Power Loan	0.3	0.6	0.9	1.2	1.6	1.9	2.4	2.8	3.3	3.8	4.3	4.3	4.3	4.3	4.3	4.9	
Subtotal	0.6	1.3	2.0	2.7	3.4	4.2	4.9	5.7	6.5	7.4	8.3	8.6	9.0	9.3	9.7	11.0	1%
COMMERCIAL																	
Incentive Based																	
Commercial Lighting Program	9.1	18.7	27.7	36.0	44.6	49.4	54.0	58.3	62.3	66.1	67.7	68.9	69.0	69.9	70.7	80.6	
LED Roadway Lighting Conversion Program	0.7	1.5	2.1	2.9	3.8	4.6	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.9	
Commercial Building Envelope - Windows Program	1.0	1.9	2.7	3.5	4.3	5.1	5.9	6.7	7.6	8.4	9.2	10.1	10.9	11.7	12.6	14.3	
Commercial Building Envelope - Insulation Program	1.0	1.9	2.7	3.4	4.2	4.9	5.7	6.4	7.2	8.0	8.7	9.5	10.2	11.0	11.8	13.4	
Commercial Geothermal Program	0.4	1.3	2.3	3.5	4.9	6.3	7.8	9.6	11.4	13.3	15.3	17.4	19.6	21.9	24.3	27.7	
Commercial HVAC Program - Chillers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Commercial HVAC Program - CO2 Sensors	0.1	0.1	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.3	1.3	1.3	1.3	1.3	1.3	1.4	
Commercial Custom Measures Program	0.2	0.5	0.8	1.1	1.4	1.8	2.1	2.5	2.9	3.3	3.7	4.1	4.6	5.1	5.7	6.5	
Commercial Building Optimization Program	0.1	0.2	0.4	0.5	0.7	0.9	1.2	1.4	1.7	2.0	2.2	2.4	2.5	2.7	2.9	3.3	
New Buildings Program	4.1	9.5	16.3	16.3	16.6	17.4	18.5	19.9	21.7	21.7	21.7	21.7	21.7	21.7	21.7	24.8	
Commercial Refrigeration Program	1.2	1.8	2.1	2.5	2.8	3.2	3.6	4.0	4.4	4.9	5.4	5.8	6.2	6.6	7.0	8.0	
Commercial Kitchen Appliance Program	0.6	1.5	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.7	3.1	
Network Energy Management Program	0.2	0.5	0.8	1.3	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0	
Internal Retrofit Program	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Power Smart Shops	0.0	0.0	0.2	0.4	0.6	0.9	0.9	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.3	
Subtotal	18.8	39.7	61.4	75.0	89.6	100.3	110.8	121.1	131.6	140.2	146.6	152.6	157.5	163.4	169.3	193.0	26%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	
Subtotal	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0%
INDUSTRIAL																	
Performance Optimization Program	2.4	5.3	8.6	12.2	16.3	20.4	24.4	28.5	32.6	36.7	40.7	44.8	48.9	53.0	57.0	62.7	
Subtotal	2.4	5.3	8.6	12.2	16.3	20.4	24.4	28.5	32.6	36.7	40.7	44.8	48.9	53.0	57.0	62.7	9%
ENERGY EFFICIENCY SUBTOTAL	29.7	61.6	94.8	119.8	145.7	167.7	189.1	208.7	228.4	246.0	258.7	269.8	279.7	290.1	300.6	340.4	46%
LOAD MANAGEMENT																	
Curtailable Rate Program	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	160.9	
LOAD MANAGEMENT SUBTOTAL	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	146.2	160.9	23%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																	
Bioenergy Optimization Program	1.5	3.1	4.3	5.5	6.3	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.8	
Customer Sited Load Displacement	21.9	34.1	50.9	61.9	77.9	81.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	94.5	
LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL	23.4	37.2	55.1	67.3	84.2	89.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	102.3	14%
CONSERVATION RATES																	
Conservation Rates - Residential	0.0	0.0	0.0	0.0	3.1	10.9	12.0	13.1	14.5	15.9	16.1	16.3	16.5	16.7	16.9	19.2	
Conservation Rates - Commercial	0.0	0.0	0.0	0.0	0.0	5.2	11.4	15.4	16.6	17.8	19.0	20.3	21.6	23.0	24.3	27.8	
CONSERVATION RATES SUBTOTAL	0.0	0.0	0.0	0.0	3.1	16.1	23.3	28.5	31.0	33.7	35.1	36.6	38.1	39.7	41.2	47.0	6%
FUEL CHOICE																	
Fuel Choice	0.0	0.0	0.0	13.3	26.7	40.0	53.4	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	76.1	
FUEL CHOICE SUBTOTAL	0.0	0.0	0.0	13.3	26.7	40.0	53.4	66.7	66.7	66.7	66.7	66.7	66.7	66.7	66.7	76.1	10%
Impacts (at meter)	199	245	296	347	406	459	505	543	565	586	600	612	624	636	648		
Impacts (at generation)	220	272	329	386	453	513	565	609	634	657	673	687	700	713	727		
Codes, Standards & Regulations (at meter)	19	42	71	101	129	154	179	203	226	249	271	294	316	337	359		
Codes, Standards & Regulations (at generation)	22	48	81	115	147	176	204	231	258	284	309	335	360	385	409		
POWER SMART 2014 to 2028 Impacts (at meter)	219	287	367	448	535	613	684	746	791	834	871	906	939	973	1,007		
POWER SMART 2014 to 2028 Impacts (at generation)	243	319	411	502	600	689	769	840	891	940	982	1,022	1,059	1,098	1,136		
POWER SMART SAVINGS TO DATE																	
Incentive Based Program Impacts (at meter)	240	240	240	240	240	240	240	240	239	239	239	238	238	237	237		
Incentive Based Program Impacts (at generation)	270	270	270	270	270	270	270	270	269	269	269	268	268	267	267		
Customer Service Initiatives Program Impacts (at meter)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
Customer Service Initiatives Program Impacts (at generation)	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11		
Discontinued Programs (at meter)	46	46	42	38	50	50	50	50	50	50	50	50	50	50	50		
Discontinued Programs (at generation)	52	52	48	43	56	56	56	56	56	56	56	56	56	56	56		
Impacts of Codes & Standards (at meter)	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145		
Impacts of Codes & Standards (at generation)	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166		
TOTAL MW (at meter)	660	728	805	881	979	1,058	1,129	1,191	1,235	1,279	1,315	1,349	1,382	1,415	1,448		
TOTAL MW (at generation)	741	818	905	991	1,103	1,192	1,272	1,343	1,393	1,442	1,484	1,523	1,560	1,597	1,635		

Note: May not add up due to rounding.

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	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	Interim Estimate 2013/14	Benchmark 2028/29	At Generation 2028/29	
RESIDENTIAL Incense Based																												
Home Insulation Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	2.03	5.16	7.96	10.69	13.77	16.38	18.81	21.69	23.96	23.96	27.31	
Lower Income Energy Efficiency Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.34	0.78	1.14	1.54	2.01	2.45	3.78	4.54	
New Home Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.19	0.44	0.73	0.97	1.18	1.46	1.63	1.63	1.63	1.63	1.86	
Refrigerator Retirement Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	1.82	3.04	0.00	0.00	0.00	
Community Geothermal Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.37	0.42	
Water and Energy Saver Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70	1.34	1.71	2.09	2.08	2.37	
Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86	2.22	5.60	8.81	12.01	15.65	20.08	25.50	31.40	37.02	33.98	38.74	
Customer Service Initiatives																												
Power Smart Residential Loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.80	1.10	1.39	1.64	2.00	2.73	3.84	3.93	4.22	4.39	4.69	4.94	4.94	5.63	
Residential Earth Power Loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.25	0.63	1.06	1.42	2.07	2.47	2.99	3.28	3.77	3.83	3.86	3.86	4.40	
econergy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential PAYS Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.10	
Power Smart for Business PAYS Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.63	0.71	
Solar Hot Water Heating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.89	1.35	2.02	2.70	3.42	4.80	5.51	6.92	7.50	8.16	8.52	9.52	9.52	10.85	
DISCONTINUED/COMPLETED																												
Appliances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	1.01	1.59	1.71	1.71	1.71	1.71	1.71	1.71	1.94	
Seasonal LED Lighting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.12	0.17	0.20	0.21	0.21	0.21	0.21	0.21	0.21	0.24	
Outdoor Timer	0.29	0.52	0.90	1.23	1.51	1.86	1.99	2.28	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.72	
Res Hot Water	0.00	0.00	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10	
Water Heater Rental	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	
Thermostat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Retrofit/Demonstration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
RIBS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
High Efficiency Furnace & Boiler	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Energy Efficient Light Fixtures	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.21	0.33	0.43	0.59	0.74	0.74	0.74	0.74	0.85	
Compact Fluorescent Lighting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64	3.11	4.15	5.69	10.18	17.72	21.33	21.33	21.33	21.33	20.96	23.90	
PSEM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.10	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.16	
R2000 House	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	
Subtotal	0.29	0.52	0.96	1.30	1.57	1.92	2.06	2.36	2.51	2.55	2.56	2.56	2.64	2.70	2.67	4.35	5.87	7.52	9.79	15.00	23.21	26.98	27.13	27.13	27.13	26.76	30.51	
RESIDENTIAL TOTAL	0.29	0.52	0.96	1.30	1.57	1.92	2.06	2.36	2.51	2.55	2.56	2.56	3.11	3.58	4.02	7.22	10.79	16.54	23.40	32.52	45.78	54.55	60.79	67.04	73.66	70.25	80.09	
COMMERCIAL Incense Based																												
Commercial Lighting Program	0.00	0.00	0.00	0.50	2.59	5.72	9.17	10.78	11.57	15.14	16.37	17.35	18.54	19.65	21.68	24.22	27.65	31.14	34.05	38.51	42.30	45.75	48.78	55.96	62.46	62.46	71.20	
Commercial Earth Power Program	0.00	1.40	1.45	0.00	0.00	0.15	0.00	0.11	1.40	1.11	1.40	1.11	1.40	1.11	1.40	1.11	1.40	1.11	1.40	1.11	1.40	1.11	1.40	1.11	1.40	1.11	1.29	
Commercial Insulation Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.75	1.84	3.17	4.85	6.22	8.13	11.00	11.00	12.54		
Commercial Windows Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.17	0.26	0.31	0.39	0.45	0.62	0.82	1.05	1.49	1.66	1.76	2.09	2.97	3.99	4.62	6.06	6.06	6.91		
Internal Retrofit Program	0.00	0.00	0.00	0.04	0.33	0.56	0.65	0.74	0.87	1.03	1.10	1.22	1.26	1.36	1.69	2.16	2.41	2.83	3.00	3.24	3.54	4.04	4.76	8.10	9.21	9.21	10.50	
Commercial Customer Measures Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.84	1.54	1.63	1.92	2.13	3.50	4.22	4.22	4.81	
Commercial Refrigeration Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Commercial HVAC Program - Chiller	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
City of Winnipeg Power Smart Agreement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.27	1.61	2.00	2.14	2.20	2.38	2.48	2.58	2.62	2.62	2.62	2.98	
Commercial Clothes Washers Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Commercial Kitchen Appliance Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Power Smart Shops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Commercial Building Optimization Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Network Energy Management Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
New Buildings Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	1.01	1.27	1.45
CO2 Sensors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						

TAB 2

PUB/MH I-216(b) example - DSM versus new supply (e.g. showerhead)**Part 1 - PUB/MH I-216b example****Utility**

		Example #1 Existing	Example #2 Add Supply 100 GW.h at \$0.10/kW.h new gen or lost exports	Example #3 Add DSM 100 GW.h at \$0.10/kW.h	Example #4 Add DSM 100 GW.h at \$0.027/kW.h
row					
1	Net Revenue Req (\$M)	\$70	\$70	\$70	\$70
2	added: gener. or lost exp.	0	\$10	0	0
3	added: DSM cost	0	0	\$10	\$2.7
4(1+2+3)	Total	\$70	\$80	\$80	\$72.7
5	Sales(GW.h)	1,000	1,000	1,000	1,000
6	added: growth	0	100	100	100
7	less: DSM	0	-	- 100	- 100
8(4+5+6)	Total	1,000	1,100	1,000	1,000
9 (4/8)	Average Rate (\$/kW.h)	\$0.0700	\$0.0727	\$0.0800	\$0.0727
Customer				participating customer	non participating customer
10	Usage (kW.h/yr)	10,000	10,000	9,000	10,000
12 (9*10)	Bill (\$/yr)	\$700.00	\$727.00	\$720.00	\$800.00
					\$654.30
					\$727.00

PUB/MH I-216(b) example - DSM versus new supply (e.g. showerhead)**Part 1 - PUB/MH I-216b example**

Utility		Example #1 Existing	Example #2 Add Supply 100 GW.h at \$0.10/kW.h new gen or lost exports	Example #3 Add DSM 100 GW.h at \$0.10/kW.h	Example #4 Add DSM 100 GW.h at \$0.027/kW.h
row					
1	Net Revenue Req (\$M)	\$70	\$70	\$70	\$70
2	added: gener. or lost ex	0	\$10	0	0
3	added: DSM cost	0	0	\$10	\$2.7
4(1+2+3)	Total	\$70	\$80	\$80	\$72.7
5	Sales(GW.h)	1,000	1,000	1,000	1,000
6	added: growth	-	100	100	100
7	less: DSM	-	-	- 100	- 100
8(4+5+6)	Total	1,000	1,100	1,000	1,000
9 (4/8)	Average Rate (\$/kW.h)	\$0.0700	\$0.0727	\$0.0800	\$0.0727
Customer				participating customer	non participating customer
10	Usage (kW.h/yr)	10,000	10,000	9,000	10,000
12 (9*10)	Bill (\$/yr)	\$700.00	\$727.00	\$720.00	\$800.00
				\$654.30	\$727.00

Part 2 - DSM Ratios

13		Marginal Benefits	\$0.10/kW.h cost of new generation or lost exports			
14	ASSUMED	Non-Energy Benefits	\$0.03/kW.h water saving			
15	ASSUMED	Program Costs	\$0.02/kW.h advertising			
16	ASSUMED	Product Costs	\$0.09/kW.h purchase and installation			
			Example #3		Example #4	
17		Utility Admin Cost	\$0.02		\$0.02	
18		Incentives	\$0.08		\$0.007	
19		Total Utility Cost (from above)	\$0.10		\$0.027	
20	Integratec TRC	Marginal Benefits + Non Energy Benefit:	\$0.10+0.03	= 1.18	\$0.10+0.03	= 1.18
21	Metric	Admin Costs + Product Costs	\$0.02+0.09		\$0.02+0.09	
22	Utility RIM	Marginal Benefits	\$0.10	= 0.58	\$0.10	= 1.0
23	Ratepayer Metric	Revenue Loss + Admin Costs + Incentive Cost	\$0.0727+\$0.02+\$0.08		\$0.0727+\$0.02+\$0.007	
24	Customer	Incentives Received + Bill Savings + Non Energy Benefits	\$0.08+\$0.0727+\$0.03	= 2.03	\$0.007+\$0.0727+\$0.03	= 1.22
25	Metric	Product Costs	\$0.09		\$0.09	

PUB/MH I-216(b) example - DSM versus new supply (e.g. showerhead)

Part 1 - PUB/MH I-216b example		Example #1	Example #2	Example #3	Example #4	
Utility		Existing	Add Supply 100 GW.h at \$0.10/kW.h new gen or lost exports	Add DSM 100 GW.h at \$0.10/kW.h	Add DSM 100 GW.h at \$0.027/kW.h	
row						
1	Net Revenue Req (\$M)	\$70	\$70	\$70	\$70	
2	added: gener. or lost exp.	0	\$10	0	0	
3	added: DSM cost	0	0	\$10	\$2.7	
4(1+2+3)	Total	\$70	\$80	\$80	\$72.7	
5	Sales(GW.h)	1,000	1,000	1,000	1,000	
6	added: growth	-	100	100	100	
7	less: DSM	-	-	- 100	- 100	
8(4+5+6)	Total	1,000	1,100	1,000	1,000	
9 (4/8)	Average Rate (\$/kW.h)	\$0.0700	\$0.0727	\$0.0800	\$0.0727	
Customer				participating customer	non participating customer	participating customer
10	Usage (kW.h/yr)	10,000	10,000	9,000	10,000	9,000
12 (9*10)	Bill (\$/yr)	\$700.00	\$727.00	\$720.00	\$800.00	\$654.30
						\$727.00

Part 2 - DSM Ratios

13		Marginal Benefits	\$0.10/kW.h cost of new generation or lost exports				
14	Assumed	Non-Energy Benefits	\$0.03/kW.h water saving				
15	Assumed	Program Costs	\$0.02/kW.h advertising				
16	Assumed	Product Costs	\$0.09/kW.h purchase and installation		Example #3	Example #4	
17			Utility Admin Cost	\$0.02		\$0.02	
18			Incentives	\$0.08		\$0.007	
19			Total Utility Cost (from above)	\$0.10		\$0.027	
20	Integrated TRC	<u>Marginal Benefits + Non Energy Benefits</u>		<u>\$0.10+0.03</u>	= 1.18	<u>\$0.10+0.03</u>	= 1.18
21	Metric	Admin Costs + Product Costs		\$0.02+0.09		\$0.02+0.09	
22	Utility RIM	<u>Marginal Benefits</u>		<u>\$0.10</u>	= 0.58	<u>\$0.10</u>	= 1.0
23	Ratepayer Metric	Revenue Loss + Admin Costs + Incentive Cost		\$0.0727+\$0.02+\$0.08		\$0.0727+\$0.02+\$0.007	
24	Customer	<u>Incentives Received + Bill Savings + Non Energy Benefits</u>		<u>\$0.08+\$0.0727+\$0.03</u>	= 2.03	<u>\$0.007+\$0.0727+\$0.03</u>	= 1.22
25	Metric	Product Costs		\$0.09		\$0.09	

Part 3 - DSM Unit Costs

26	Integrated LRC	<u>Product Costs + Admin Costs</u>		\$0.09+\$0.02	= \$0.11/kW.h	\$0.09+\$0.02	= \$0.11/kW.h
27	Metric	Energy					
28				with Non Utility Benefits included		with Non Utility Benefits included	
29				(\$0.03 offset)	= \$0.08/kW.h	(\$0.03 offset)	= \$0.08/kW.h
30	Utility LUC	<u>Admin Costs + Incentives</u>		\$0.02+\$0.08	= \$0.10/kW.h	\$0.02+\$0.007	= \$0.027/kW.h
31	Ratepayer Metric	Energy					

TRC = Total Resource Cost RIM = Rate Impact Measure LRC = Levelized Resource Cost LUC = Levelized Utility Cost



REFERENCE: Chapter 4: The Need for New Resources; Section: 4.2.2.2; Chapter 4, 4.2.2.2, Pg. 23- DSM Screening

PREAMBLE: In evaluating Demand-Side Management programs, the Rate Impact Measure test should not be a barrier to higher levels of Demand-Side Management savings and should be applied only at the portfolio level, not the individual program level. Order 43/13 Page 44

QUESTION:

Please more fully describe the framework used to assess DSM opportunities, including economics, barriers and fairness of all ratepayers.

RESPONSE:

The framework used by Manitoba Hydro to assess DSM opportunities is based on the following underlying and key principles:

- All economic DSM opportunities should be pursued; and
- The optimal strategy in pursuing those economic DSM opportunities should consider :
 - 1) Each DSM opportunity individually to determine the appropriate strategy for implementation;
 - 2) The benefits and synergies of taking a broader, long term and holistic perspective towards pursuing DSM opportunities;
 - 3) The overall benefits and costs associated with DSM opportunities, irrespective of who benefits and pays;
 - 4) The value proposition of pursuing DSM opportunities from a customer, utility and societal perspective;
 - 5) The fairness of who pays for DSM initiatives given the benefits are not shared equally among all customers.



1 The economics of a DSM opportunity are assessed as described in Section 4.2.2.2. of Manitoba
2 Hydro's submission, including the metrics used by the Corporation. All metrics provide useful
3 information in the DSM decision making process which considers whether a DSM opportunity
4 should be pursued, and if so, the best strategy for pursuing the DSM opportunity.

5
6 Manitoba Hydro uses the Marginal Resource Cost (MRC) to assess the incremental benefits of
7 implementing a DSM measure relative to the incremental costs. If the benefits are greater than
8 the costs (i.e. $MRC > 1$), then the DSM opportunity should be pursued. The MRC metric
9 provides a simplistic perspective which only compares the incremental cost of implementing a
10 DSM measure to the marginal value associated with implementing the DSM measure. No
11 consideration is given to program administration costs or free ridership (ie. natural
12 conservation whereby some customers would implement the DSM opportunity without any
13 market intervention). Manitoba Hydro will consider all DSM opportunities having a $MRC > 1$. In
14 addition, Manitoba Hydro generally supports DSM opportunities with $MRC < 1$ through
15 educational/awareness initiatives and supports emerging technologies, recognizing the costs of
16 these technologies may change over time.

17
18 In assessing alternative strategies for pursuing a DSM opportunity, Manitoba Hydro considers
19 the economics from all perspectives, the barriers to participation and the fairness to all
20 ratepayers. Manitoba Hydro designs programs by taking a balanced approach to achieving the
21 objectives outlined above.

22
23 In assessing the merits of various approaches to supporting and promoting a DSM opportunity,
24 Manitoba Hydro uses the various metrics discussed in s. 4.2.2.2 of the submission as guidelines
25 in choosing a strategy which is most appropriate for each specific DSM opportunity. The
26 analysis involves:



Needs For and Alternatives To PUB/MH I-216b

- 1 • Understanding what barriers exist for each DSM opportunity, including product
- 2 availability, upstream delivery constraints, customer awareness, customer benefits
- 3 versus costs, customer financial constraints, and customer priorities;
- 4 • Assessing alternative utility strategies, including awareness efforts, customer incentives
- 5 including varying levels, upstream incentives including varying levels, financing tools,
- 6 program delivery options, duration of programming efforts, and varying programming
- 7 efforts over time (e.g. potentially ramping up incentives over time to capture deeper
- 8 energy savings within a targeted market or opportunity);
- 9 • Assessing alternative utility strategies against the value proposition associated with
- 10 DSM opportunities;
- 11 • Assessing the fairness of a utility's investment on behalf of non-participating customers;
- 12 and
- 13 • Assessing the reasonableness of a utility's investment on behalf of all ratepayers.

14

15 Manitoba Hydro uses the DSM metrics as guidelines rather than rigid requirements due to the

16 varying dynamics associated with each DSM opportunity and with Manitoba Hydro's business

17 environment. Examples of varying dynamics which may influence Manitoba Hydro's DSM

18 decision making include:

- 19 • Government incentives such as those offered through the Federal ecoENERGY Retrofit
- 20 program. Manitoba Hydro temporarily modified its programs to take advantage of the
- 21 window of opportunity to increase customer participation and capture additional
- 22 energy savings;
- 23 • Market acceptance factors which may accelerate expected adoption rates. In such
- 24 cases, an optimized strategy to pursue the opportunity may be a deferred, a non-
- 25 incentive based program or potentially a non cost effective initiative (e.g. even without
- 26 having an incentive-based program promoting residential LED lighting, Manitoba Hydro
- 27 has observed the shelf space for LED lighting in Manitoba retail stores is comparable to
- 28 other regions);



- 1 • Timing of incentives. An optimized strategy for pursuing some DSM retrofit
2 opportunities may involve offering lower incentives initially and subsequently offering
3 higher incentives and greater outreach to capture deeper energy savings within the
4 particular DSM opportunity, recognizing that in the latter stages of the overall strategy,
5 the DSM initiative may no longer be cost effective.
- 6 • Electricity export market conditions. By way of example, this occurred during the post
7 2008 timeframe, when Manitoba Hydro's short-term electricity market was less
8 favourable, which impacted the aggressiveness and timing of pursuing certain DSM
9 opportunities. For example, customer self-generation based on short term economic
10 value was no longer economic. Further, for retrofit opportunities, alternative timing
11 options are available for capturing energy savings which may offer a more optimal DSM
12 approach, with the energy savings still captured by a targeted date even with a delayed
13 launch date. The value of capturing targeted energy savings in the mid and longer term
14 is still important.

15
16 With respect to assessing the fairness of a utility's investment in DSM on behalf of non-
17 participating customers and assessing the reasonableness of a utility's investment on behalf of
18 all ratepayers, Manitoba Hydro uses the various DSM metrics as guidelines in an overall effort
19 to balance its objective of pursuing all economic opportunities against the objectives of being
20 fiscally responsible and being mindful of the net impact on all customers. For example:
21 although the impact of a particular DSM strategy and overall investment might result in
22 Manitoba Hydro's aggregate customer bills being lower, the impact on specific customer
23 segments may be different with participating customers potentially having lower bills at the
24 expense of non-participating customers having higher bills. This is best illustrated by
25 considering a simple example associated with a generic utility confronted with a decision on to
26 meet additional load, as follows:



Theoretical Example: A Utility has 1000 GWh of existing load, has 1000 GWh of existing generation and has an embedded cost of service equal to 7 cents/kWh. In the current situation:

- the utility's aggregate customers' bills are \$70 million
- A typical customer using 10,000 kWh per year has an annual bill of \$700.

Next year, the utility's load is expected to increase by 100 GWh. which is associated with additional customers using the same average load as the existing customers (e.g. 10,000 kWh/year). The utility can either meet the new load requirements through adding additional generation or through DSM initiatives. Under the alternative options available to the utility, the impact to customer bills are as follows:

Case A: Utility adds 100 GWh of new generation at a levelized cost of 10 cents/kWh. which increases its embedded cost such that rates need to be increased to 7.27 cents/kWh. ($(\$70 \text{ million} + (\$0.1/\text{kWh} \times 100 \text{ GWh})) / 1,100 \text{ GWh}$). With this option:

- Total aggregate customer bills are \$80 million.
- A typical customer using 10,000 kWh per year now has an annual bill of \$727 which reflects the higher cost associated with the new generation added to the utility's system.

Case B: Utility invests in DSM and reduces its load by 100 GWh or the equivalent amount expected coming from additional load growth. The investment by the utility in DSM is equivalent to the cost of new generation (10 cents/kWh) and the utility's rates are now increased to 8 cents/kWh ($\$80 \text{ million revenue requirement divided by } 1000 \text{ GWh of load}$). This reflects the difference between generation options and DSM options as there is no additional revenue associated with DSM while there is with adding new generation. As a result, rates have to increase by a greater amount under the DSM option when an equivalent dollar amount



is invested in the DSM option. In this case, it is assumed the utility pays the entire cost of the DSM initiatives and participating customers do not contribute. For this example, it is assumed the participating customers in DSM experience a 10% reduction in load which in aggregate achieves the targeted 100 GWh. With this option:

- Total aggregate customer bills are \$80 million (i.e. the same as if the utility invested the equivalent amount in additional generation).
- Participating customers in DSM have typical annual bills associated with 9,000 kWh of \$720 (subject to rounding, equivalent to Case A where the utility used new generation to meet the additional load requirements).
- Non participating customers have typical annual bills associated with 10,000 kWh of \$800 which is higher than what these customers would have experienced under Case A.

Case C: Utility invests in DSM and reduces its load by 100 GWh; however in this case, the utility shares the cost of achieving the DSM energy savings with participating customers, with the utility investing a levelized 0.27 cents/kWh and the participating customers contributing the balance. Under this scenario, the utility needs to raise rates to 7.27 cents/kWh. In this case:

- Total aggregated customer bills are \$72.7 million.
- Participating customers in DSM have annual energy bills associated with their reduced load (9,000/kWh) of \$654 however these customers also were required to contribute to the investment in DSM.
- Non participating customers now have annual bills of \$727, which is the same as if the utility had invested in new generation.

As demonstrated in the theoretical example, Case C attempts to balance the fairness issue by ensuring non participating customers in DSM are as well off under the option where a utility invests in DSM opportunities as opposed to new generation options. The example is provided to illustrate the importance of considering the fairness issue and providing an understanding

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1 how benefits realized by participating customers can be at the expense of non participating
2 customers.

3

4 Caution must be exercised in extrapolating the results associated with this theoretical example
5 into Manitoba Hydro's situation. As described in the response to CAC GAC/MH 1-018(b), costs
6 and potential rate impacts for Manitoba Hydro and its customers are more complicated than
7 presented in the theoretical example.